AGIE

AGIEVISION 2 CUT

C12.4
Reference Guide

Description of input formats and functions

Valid from AGIEVISION 2 Version 03.04.00

04.2003

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New functions introduced from Version 04.01

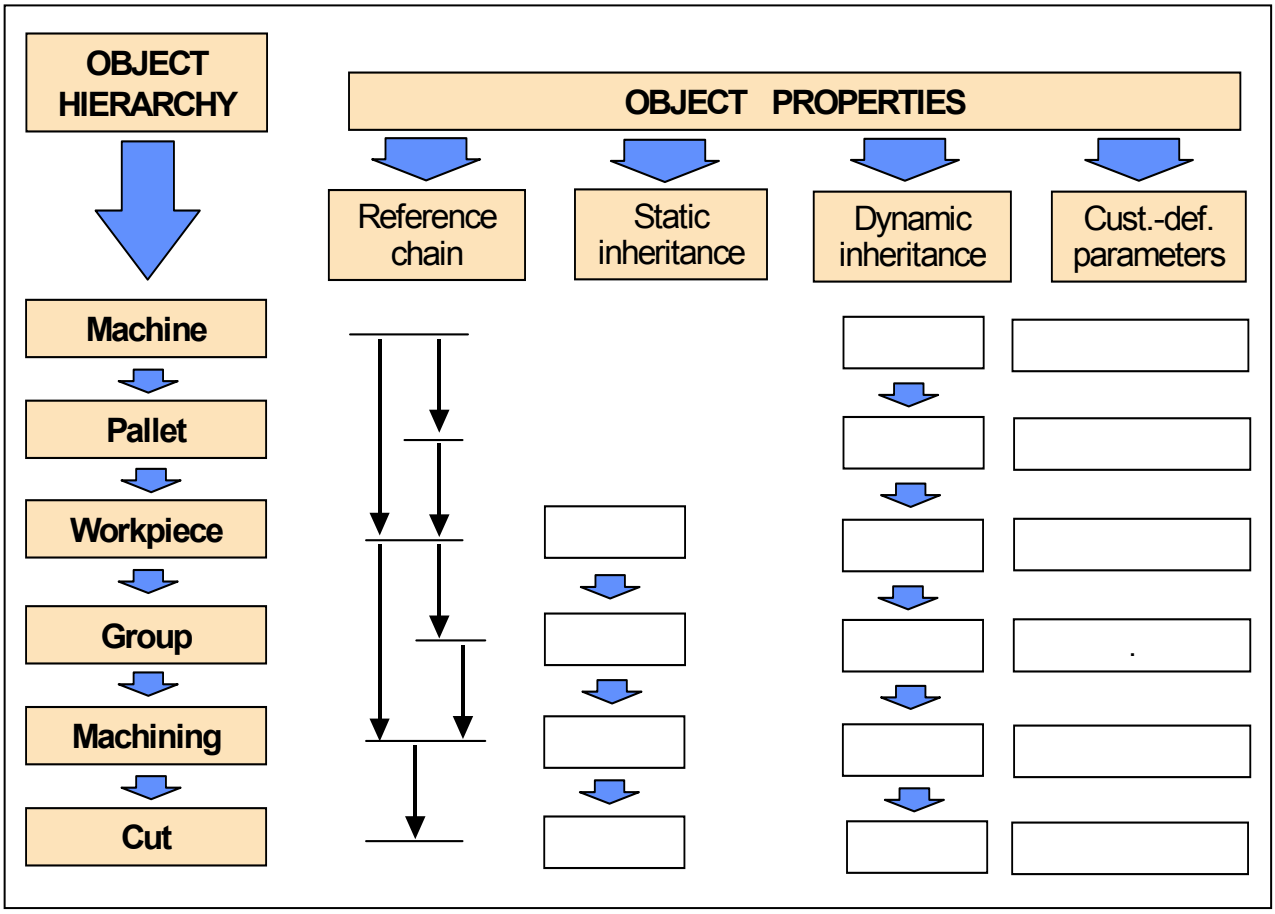
ID_SETUSCA	see Chapter 4.5, JE_AttribObject Function
ID_SETUSCB	see Chapter 4.5, JE_AttribObject Function

1 Introduction

In this document you will find the commands with all their parameters and their relative syntax, but without a deep explanation in what context they have to be put.

This Reference Guide, together with a Programming Manual (under construction), have been written to allow manufactures of programming systems (CAD / CAM) to write postprocessors or data carriers for the CNC controlled wire EDM systems of the series AGIECUT EVOLUTION / CLASSIC / EXCELLENCE / CHALLENGE. This document is valid only for machines with AGIEVISION Version 03.04 or newer.

2 Object Hierarchy on AGIEVISION



2.1 Terms

- **Reference chain:**

  Chain of all positioning from the machine zero point to the respective object of interest.
  Example: Machine zero point > Piece reference > Machining reference

- **Static inheritances are:**

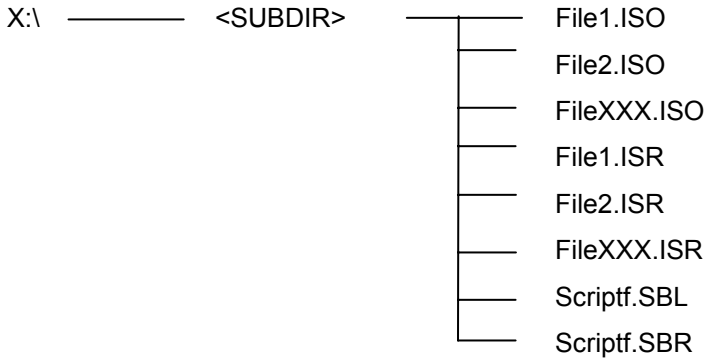
  Properties which are adopted from the higher-ranking object during generation of an object.
  Example: Machining targets / Piece data

- **Dynamic inheritances are:**

  Properties that at the time of their definition also apply for subordinate objects, regardless of whether these objects already exist or not.
  Example: Events

- **Customer-defined parameters:**
  Modifiable basic setting values (default values) parameters to suit own requirements and which can be used again.
  Example: Entry cut, separation cut or radius strategy, etc.

3 Physical file structure



3.1 V/ISO – files (*.ISO, *.ISR)

Each contour, or geometric shape in a Workpiece, has to be stored in a file. The extension has to be *.ISO. The physical filename must be maximum 8 characters in length. If a long filename must appear on the AGIECUT, then a Reference Isofile is needed, with the extension *.ISR. The physical name of the file must be the same as the *.ISO file.

The content of the file *.ISR for long file names is a single line beginning with a dot followed by the keyword LONGNAME and the name of the file to appear on the machine (max. 19 characters):

.LONGNAME *longfilename*;

All the Isofiles (*.ISO, *.ISR) must reside in the same directory or subdirectory as the Scriptfile. The name of the directory is free. **Do not use "_" characters inside the *longfilename.ISO***

3.2 Script – files (*.SBL, *.SBR)

Each Scriptfile can hold only one Workpiece definition, but with as many geometrical shapes (V/ISO – files) as you want (**There are limits due to the SBL-constant space capacity, see Addendum B of this manual**). Each geometry is referenced by a call inside the script (see ID_GEOMETRY). The extension of the scriptfile must be .SBL. The physical name of the file must be maximum 8 characters in length. If a long filename must appear on the AGIECUT, then in the reference Scriptfile (*.SBR), you must insert following line at the beginning:

.LONGNAME *longfilename*;

Each Scriptfile must have a Reference Scriptfile (*.SBR). It must have the same physical name as the Scriptfile and must reside in the same directory or subdirectory. The name of the directory is free. **Do not use "_" characters inside the *longfilename.***

3.3 Rules for a correct SBR-file

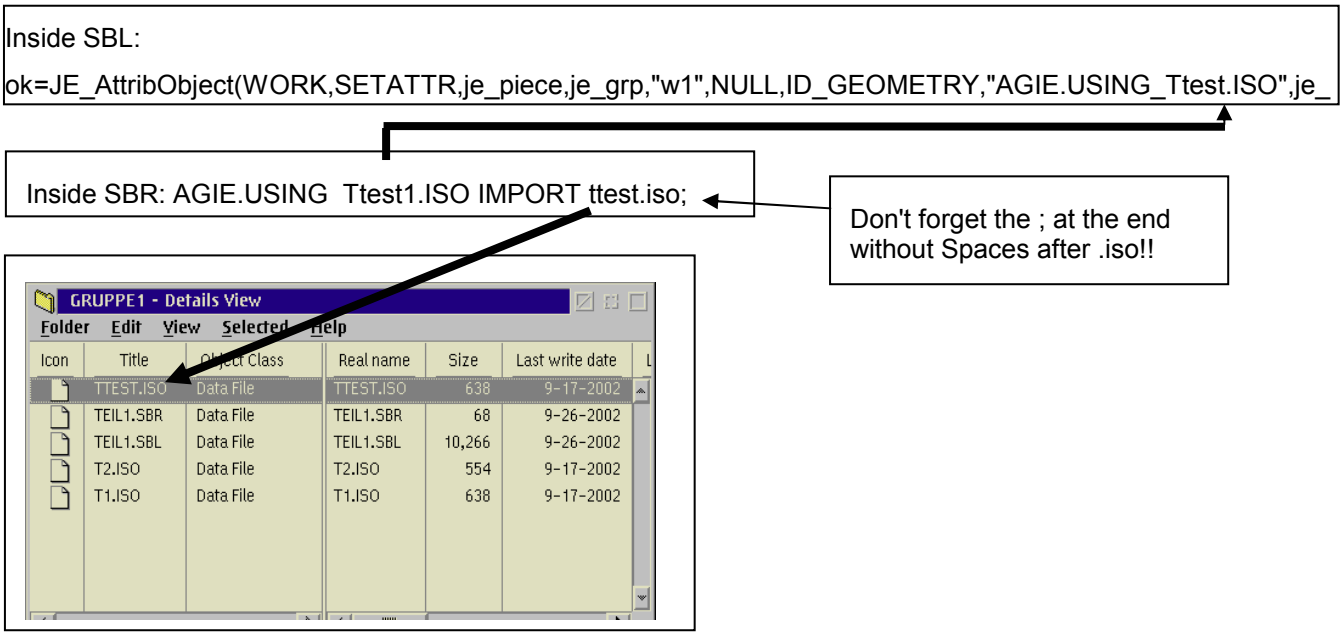
The SBRfile holds possibly 2 types of information:

- A LongFileName definition of the SBLfile (See 3.2)
- All Isofiles needed in the corresponding SBL.

The isofile syntax is made of two parts, a left and a right part:

AGIE.USING_TTest.ISO IMPORT ttest.iso;

The first name on the left part AGIE.USING_TTest.ISO is the VIRTUAL Name of the Geometry and it MUST match exactly the name given in the SBL in the sentence with ID_GEOMETRY. The right part can be written as wanted, as it corresponds to the physical filename in the harddisk directory, which is formatted in FAT.



4 Work program [scriptfile *.SBL]

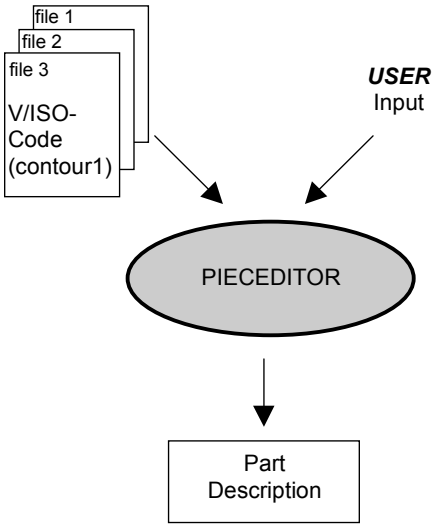
4.1 Introduction scriptfile

The script language creates complete AGIE workpiece description files with minimal user intervention. The basic language is called SBL. AGIE extended SBL to include some PIECEDITOR related functions. The user does not have to cope with the workpiece description file format. He must only specify PIECEDITOR actions through high level functions. This approach can be used by CAD / CAM systems to convey workpiece information, other than the geometrical description of works, such as start points, punch/die/open contour, work type, etc.

4.2 The AGIECUT data input system AGIEVISION

With the support of the PIECEDITOR tool of AGIEVISION you can define the parts which you want to cut on a piece, by defining both the properties of the piece (material, height, reference system...) and of the machinings (the desired surface quality, the position, the starting point...). The contour of a machining is assumed to be in a file with a well-defined format (see chapter 7 / V/ISO-Code file).

This file contains information pertaining exclusively to the geometrical properties of a part. The remaining machining information (starting point, entry path, punch/die/open contour...) that are needed to define a complete part are entered interactively through the PIECEDITOR.

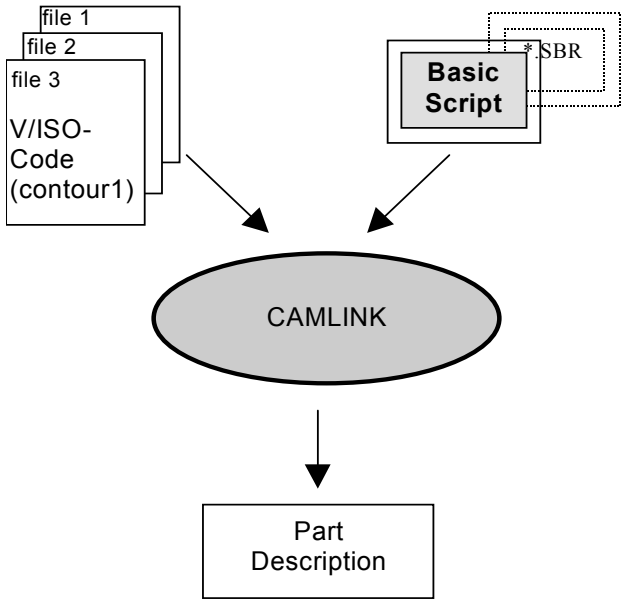


4.3 User task automation

By using the AGIE implemented SBL - PIECEDITOR functions, machining information can be performed automatically without the user input described above. The resulting file is called the **scriptfile**.

The scriptfile would then be executed on the machine to build the complete piece description.

The commands of the scriptfile are interpreted by the CAMLINK (standard module on AGIEVISION called in ACTION-New workpiece-“Script Files”). It automatically loads the workpiece description file and performs editing actions (the commands described in it) just like the user would.

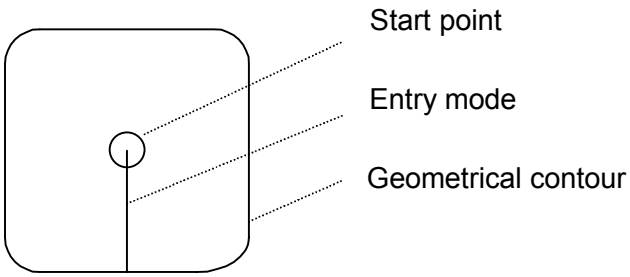


The product of a CAD / CAM postprocessor consists of

- one file for each different geometrical contour (V/ISO-Code file)
- one or more basic scriptfiles (each with SBR-file attached)

A big difference between A G I E V I S I O N CNC approach and the AGIEMERIC CNC 123 is the separation of the geometric and machining information. The machining information is contained in the scriptfile and doesn't contain M or G codes, but high level functions used to communicate with the AGIEVISION.

This difference could be explained in a first example of a die (20mmx20mm) with 4 rounding radii of 1mm and a height of 30mm.



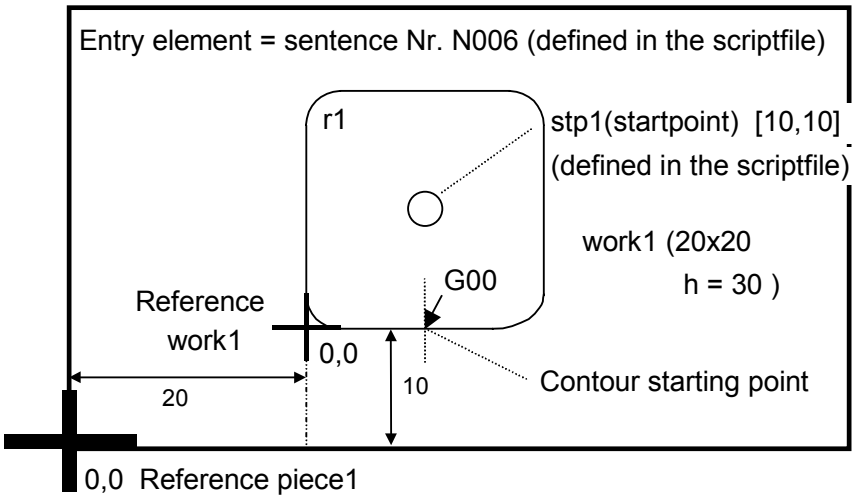
Supposing that the CAD / CAM system can individualise the start point, the contour and the entry path, the resulting code for the AGIEMERIC CNC 123 would be:

ISO-code of the AGIEMERIC CNC 123

The sentence 'N004' contains all the calls for the registers to be used for the offset, the angle, the generator, the flushing and the wire.

```
! programmed contour global main cut
%N002M63                                    // Implicit start point
N004D01T01S01G43                            // Start geometrical description
N006G01X+009000G44                          // First contour element
N008G01Y-010000G40                          // Entry to the contour
N010G03X+001000Y+001000J+001000G44          // Second contour element
N012G01Y+018000
N014G03X-001000Y+001000I-001000
N016G01X-018000
N018G03X-001000Y-001000J-001000
N020G01Y-018000
N022G03X+001000Y-001000I+001000
N024G01X+008000
N026M00                                     // Stop to fix the drop-out part  (slug )
N028G01X+001000                             // Last contour element
N030G01X+001000G44
N032G01Y+010000G40M21                       // Exit from the contour
N034G45M21                                  // End geometrical description
N036M02                                     // Program end
```

Example 1 / AGIEVISION



If a CAD / CAM system is to single out only the contour of the work, then it must generate only a V/ISO-Code file. The user must then input the remaining machining information as described in section 4.2 using the PIECEDITOR (i.e. no scriptfile is necessary).

This is the resulting V/ISO for AGIEVISION

A V/ISO-Code file contains only the geometrical information of one single contour. It contains no technological information. The geometrical information is limited at the contour path.

The advantage of this is that a die and a punch can use the same V/ISO-Code!

Example 1 / work1a.iso
(with absolute values in X, Y and Z)

```
N00002 G00 X10.0 Y0.0;          # Contour starting point / relative to the work reference
N00004 G90                      # The values in X, Y and  Z are absolute
N00006 G01 X19.0;               # First contour element
N00008 G03 X20.0 Y1.0 J1.0 ;    # Second contour element
N00010 G01 Y19.0 ;
N00012 G03 X19.0 Y20.0 I-1.0 ;
N00014 G01 X1.0 ;
N00016 G03 X0.0 Y19.0 J-1.0 ;
N00018 G01 Y1.0 ;
N00020 G03 X1.0 Y0.0 I1.0 ;
N00022 G01 X10.0 ;              # Last contour element
N00024 M02 ;                    # Program end.
```

Example2 / work2i.iso
(with incremental values)

```
N01 G00 X10.0 Y0.0 ;            # Contour starting point / relative to the work  reference
N02 G91                         # All values are incremental.
N03 G01 X9.0 ;                  # First contour element
N04 G03 X1.0 Y1.0 J1.0 ;        # Second contour element
N05 G01 Y18.0 ;
N06 G03 X-1.0 Y1.0 I-1.0 ;
N07 G01 X-18.0 ;
N08 G03 X-1.0 Y-1.0 J-1.0 ;
N09 G01 Y-18.0 ;
N10 G03 X1.0 Y-1.0 I1.0 ;
N11 G01 X9.0 ;                  # Last contour element
N12 M02 ;                       # Program end
```

If in addition to contour, the CAD / CAM system is to single out the start-point information, entry mode, punch/die information, etc., then it must also create a scriptfile. The more information that the scriptfile contains, the less user intervention is needed.

If the CAD / CAM system wants to call the AGIE technology, it can also specify in the scriptfile the surface quality for each work, associating AGIE Database or USER Database technology automatically, further minimising the need for user intervention.

This is the resulting scriptfile: example1/piece1.sbl

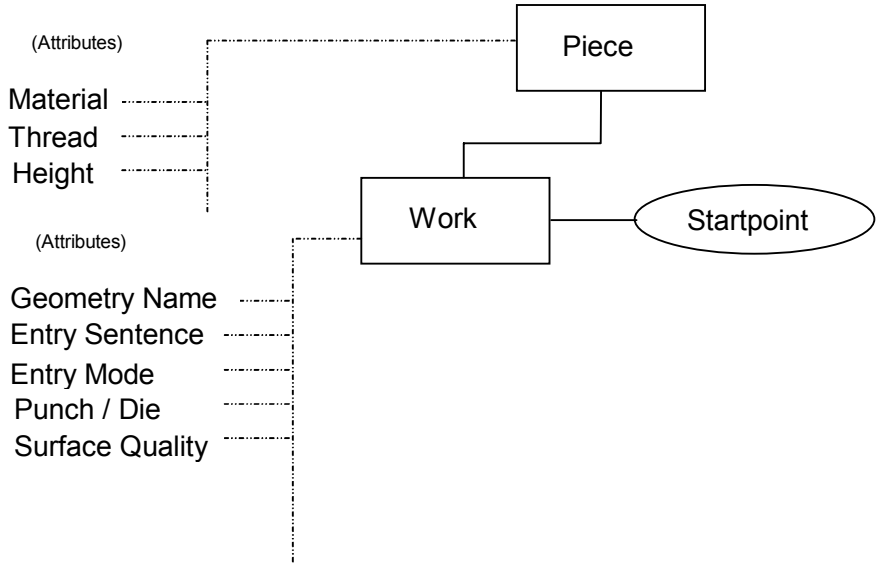
```
'$Include "jescript.sbh"
sub main
  ok = JE_Initiate
  if (ok=0) then
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"30",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"piece1",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,"0001",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut D 0.25",je_dim)
    ok=JE_Create(WORK,je_piece,je_grp,"work1")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_GEOMETRY,"AGIE.USING_work1a.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_PUNCH,c_die,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_ENTRY,"6",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_CreateQuality(je_piece,"Q1","1.8,12.5,10.0",je_q1)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_QUALITY, je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_SEPCUT,"1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_REVCUT,"T",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_POSX,"20",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_POSY,"10",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"work1")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_STP,"stp1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_STPMODE,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","stp1",ID_POSX,"10",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","stp1",ID_POSY,"10",je_dim)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work1",ASDELETE,NULL)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work1",ASAGIE,NULL)
    ok=JE_ClosePiece(je_piece)
  else
    stop
  end if
end sub
```

With the attached piece1.SBR file

```
AGIE.USING_work1a.ISO IMPORT work1a.ISO;
```

4.4 A scriptfile structure

The logical data model for the example 1 / piece1.sbl:



PIECEDITOR functions which are used in a scriptfile

A brief description of the used PIECEDITOR functions in a scriptfile follows. The syntax, which is used to describe the functions, follows the SBL syntax rules together with a short example.

The object names inside the following functions have a maximum length of 19 characters:

- JE_AttribObject function
- JE_ClosePiece function
- JE_Create function
- JE_CreateQuality function
- JE_CreateStartPoint function
- JE_GenerateCuts function

- **JE_AttribObject** Function

Syntax: **JE_AttribObject&**
(byval SortOfObject as long,
byval GetSet as long,
byval PieceName as string,
byval GroupName as string,
byval WorkName as string,
byval Name as string,
byval id as long,
byval strid as string,
byval dimstr as long)

Returns: The function returns 0, if there are no errors, non-zero otherwise.

Comments:

This is a general-purpose function, which is used to query or set the value of an object's attribute. The object is specified in SortOfObject and may be one of the following:

Value	
PIECE	Select the piece specified in **PieceName** as an active object.
GROUP	Select the group specified in **GroupName** as an active object.
WORK	Select the work specified in **WorkName** as an active object.
STARTPOINT	Select the startpoint specified in **Name** as an active object.
POINT	Select the point specified in **Name** as an active object.
SECTOR	Select the sector specified in **Name** as an active object.
ASCH	Select the working step specified in **Name** as an active object.

Name is irrelevant, if the object is not a STARTPOINT, POINT, SECTOR or ASCH name otherwise it will be set as NULL.

GetSet may be one of the following :

Value	
GETATTR	It is used to query the value of a specific attribute of the object.
SETATTR	It is used to set the value of a specific attribute of the object.

- **JE_AttribObject** Function (continuation 1)

Strid is the buffer, where the value of the attribute is set or read from the object.

Dimstr is *only* used, when *GetSet* is set to GETATTR.
-> dimstr = length of **strid**
otherwise it is set to **je_dim**

id specifies the attribute of the object and may be one of the following :

If **SortOfObject** is *P I E C E :*

Value

ID_ASG	Call of an automatic sequence user-definition
ID_DIML	Length of the Piece
ID_DIMB	Width of the Piece
ID_EVTACT	Associate an Event at piece level
ID_HEIGHT	Height of the piece
ID_MATERIAL	Name of the material
ID_NOMEOBJ	Name of the piece
ID_POSX	Position in X from the measurable point
ID_POSY	Position in Y from the measurable point
ID_POSZ	Position in Z from the measurable point
ID_POSA	Angle A from the measurable point
ID_POSB	Angle B from the measurable point
ID_POSA1	Position/angle of auxiliary axis AU1
ID_ROTATION	Position in C from the measurable point
ID_POSPOSX	Position in X of the Edge from the Piece reference
ID_POSPOSY	Position in Y of the Edge from the Piece reference
ID_POSPOSZ	Position in Z of the Edge from the Piece reference
ID_QUALITY	Name of quality to obtain
ID_STATEGY	Strategy to be used for all the piece (like early, late…)
ID_THREAD	Name of kind of wire used (material & diameter)
ID_VALSECP	Distance of the security plane in mm
ID_VALRETP	Distance of the Return plane in mm
ID_ORDINE	**New in V0304.** Defines an order name to the Workpiece
ID_INDICE	**New in V0304.** Defines an index to the Workpiece

If **SortOfObject** is *G R O U P :*

Value

ID_COLLAR	The type of COLLAR. Possible types are: c_collar1:  open to the top c_collar2:  open to the bottom c_collar3:  open on both ends
ID_EVTACT	Associate an Event at Group level
ID_NOMEOBJ	Name of the group
ID_POSX	Position in X
ID_POSY	Position in Y
ID_POSZ	Position in Z
ID_PRIORITY	The priority given to a GROUP of WORKs for erosion-sequence

- **JE_AttribObject** Function (continuation 2)

If **SortOfObject** is *G R O U P :*

Value

ID_QUALITY	Name of quality to obtain
ID_ROTATION	Rotation component
ID_SORTOF	The kind of WORKS in a GROUP. Possible kinds are (**strid**) : c_collar: defines a work with a collar c_pocketing: defines a Pocketing
ID_THREAD	Name of kind of wire used for a GROUP of WORKS (material & diameter)

If **SortOfObject** is *W O R K :*

Value

ID_ASWITHOUT	Define the number of trim cuts without Reverse cut
ID_CLEARANCE	Clearance in mm between PUNCH and DIE (the clearance value is added to the offset)
ID_CLEARANCETRENN	Define the clearance increment of the separation cut
ID_COMMPOINTENTRY	Define the Entry commutation point distance from the entry
ID_COMMPOINTEXIT	Define the Exit commutation point distance from the exit
ID_DELTAPS	Trim Cut Security Level Increment. Default = 0mm
ID_ENTRY	Number of the N-bloc in the geometry file (V/ISO), where it enters the contour (entry element of the contour). It is only used for closed contours.
ID_ENTRYMODE	Entry mode to the open or closed contour where **strid** can be: c_entper = perpendicular c_enttan = tangential. c_entlib = free.
ID_EXITMODE	Exit mode from an open contour where **strid** can be: c_entper = perpendicular c_enttan = tangential. c_entlib = free.
ID_EVTACT	Associate an Event and Action at WORK level
ID_E_TYPE	Define the type of external corners without radius where **strid** can be: c_radius_rm = minimal radiuses c_radius_sv = sharp-edged corners c_radius_rf = fixed radiuses
ID_E_VALUE	Value of the external fixed radius
ID_GEOMETRY	Name of the used geometry file.
ID_HEIGHT	Height of the work only for the technology
ID_I_TYPE	Define the type of internal corners without radius where **strid** can be: c_radius_rm = minimal radiuses c_radius_sv = sharp-edged corners c_radius_rf = fixed radiuses
ID_I_VALUE	Value of the internal fixed radius
ID_POSA	Angle A of machining reference

- **JE_AttribObject** Function (continuation 3)

ID_POSB	Angle B of machining reference
ID_POSA1	Position of auxiliary axis. Depending on the type of axis, this value could be angular (degrees) or linear (mm).
ID_POSX	Position in X
ID_POSY	Position in Y
ID_POSZ	Position in Z
ID_PRIORITY	The priority given to a WORK for erosion-sequence.
ID_PUNCH	Punch, die or open contour If the contour is closed **strid** could be: c_punch or c_die If the contour is opened **strid** could be: c_left or c_right.
ID_QUALITY	Name of quality to obtain, usually **strid** is **je_q1**
ID_RADIUSMINLA	Define minimal radius last cut. **strid** could be "T" or "F" (true/false).
ID_REVCUT	Reverse cut strategy. **strid** could be: "T" or "F" (true/false).
ID_ROTATION	Rotation component
ID_SEPCUT	Separation cut length in mm.
ID_SETENTA	Deviation distance from contour entry, parallel to contour element on the entry spot (positive is in erosion direction)
ID_SETENTB	Deviation distance from contour entry, perpendicular to contour element on the entry spot (positive is in offset direction)
ID_SETENTD	Increment distance for each working step from previous entry point (valid only for closed contours, and belonging only to first entry element)
ID_SETENTM	New entry distance from previous entry point
ID_SETUSCA	**New 04.01.02**. Deviation distance from contour exit, parallel to exit contour element (positive is in erosion direction). Valid only for open contours
ID_SETUSCB	**New 04.01.02.** Deviation distance from contour exit, perpendicular to exit contour element (positive values are in offset direction). Valid only for opüen contours.
ID_SORTOF	The subpart of WORK. Possible **strid** values are: c_collar1: Conical part on top c_collar2: Cylindrical part c_collar3: Conical part on bottom **Attention**: Do not use c_collar1, c_collar3 for normal taper! c_pocketing1: Programmed pocketing path c_pocketing2: Finished contour of pocketing for trim cuts
ID_STP	Name of the startpoint (outside of the contour) associated with a closed contour.
ID_STPENTRY	Name of the startpoint entry (outside of the contour) associated with an open contour.
ID_STPEXIT	Name of the startpoint exit (outside of the contour) associated with an open contour.
ID_STPMODE	The startpoint reference mode for a closed contour **strid** could be: (c_work, c_piece or c_group).

- **JE_AttribObject** Function (continuation 4)

ID_STPOPEN	The startpoint entry reference mode for an open contour **strid** could be: (c_work, c_piece or c_group).
ID_STPOPEX	The startpoint exit reference mode for an open contour **strid** could be: (c_work, c_piece or c_group).
ID_TANGUSERE	Radius of tangent entry to contour.
ID_TANGUSERU	Radius of tangent exit from contour
ID_TAPER	Value of the taper angle for standard and ISO conic, or Value for the X-Component for a fixed taper in dec. degrees
ID_TAPERMODE	Taper modes, **strid** could be: c_stdcon = standard c_isocon = ISO c_fixcon = Fixed taper
ID_TAPERP	Defines the Y-Component of the taper angle in dec.degrees
ID_THREAD	Name of kind of wire used for a WORK (material & diameter)
ID_TUNING_U	Fine Tuning of taper on lower contour
ID_TUNING_O	Fine Tuning of taper on upper contour
ID_WORKCOND	Working conditions for VARIOCUT Strid ranges from 1 (default; Normal) to 4 (highest difficulty)

If **SortOfObject** is *S T A R T P O I N T*

Value	
ID_EVTACT	Define an Event for the Startpoint
ID_NOMEOBJ	Name of the start point
ID_DIAMETER	Diameter of the start point
ID_POSX	Position in X
ID_POSY	Position in Y
ID_POSZ	Position in Z (Used when threading with inclined wire)
ID_POSX_S	Position in X of upper Startpoint (incremental to lower X-Startpoint)
ID_POSY_S	Position in Y of upper Startpoint (incremental to lower Y-Startpoint)
ID_POSZ_S	Position in Z of upper Startpoint (incremental to lower Z-Startpoint)
ID_STP_F1	Startpoint belongs to first "Family" of linked startpoints. Linked Startpoint will not cut the wire during positioning. Strid is an integer defining the Family number. Same numbers means same family.
ID_STP_F2	Startpoint belongs also to second "Family" of linked startpoints.
ID_STP_A1	Startpoint position for auxiliary axis. Depending on the type of axis, this value could be angular (degrees) or linear (mm).

If **SortOfObject** is *P O I N T*

Value	
ID_NSENTENCE	Defines the n-bloc number of V/ISO code where the point should lie.
ID_PERSENTENCE	Defines the percentage of the segment length in the V/ISO code where the point should lie, starting from the beginning of the line segment. **Strid** can have values from 0 to 1.

- **JE_AttribObject** Function (continuation 5)

If **SortOfObject** is *S E C T O R*

Value

ID_SECT_PS	Initial point of the sector. **Strid** is the name of the point created by JE_CreatePoint
ID_SECT_PF	Final point of the sector. **Strid** is the name of the point created by JE_CreatePoint
ID_SECT_TYPE	type of sector to be created. **Strid** could be: c_sector_cle = clearance sector c_sector_tap = tapered sector c_sector_rad = corner sector c_sector_pos = Positioning sector
ID_SECT_CLEARANCE	Value of the clearance on the sector. The sign is important
ID_SECT_TAPERMODE	Type of taper to be created. **Strid** could be: c_stdcon = standard c_isocon = ISO c_fixcon = Fixed taper
ID_SECT_TAPERT	Value of the taper angle for standard and iso conic, as well as the X-Component of the taper angle for the fixed conic
ID_SECT_TAPERP	Value of the taper angle for the Y-Component of the taper angle for the fixed conic
ID_SECT_E_TYPE	Define external corner type, where **strid** could be: c_radius_rm = minimal radiuses c_radius_sv = sharp-edged corners c_radius_rf = fixed radiuses
ID_SECT_E_VALUE	Value of the external fixed radiuses in mm
ID_SECT_I_TYPE	Define internal corner type, where **strid** could be: c_radius_rm = minimal radiuses c_radius_sv = sharp-edged corners c_radius_rf = fixed radiuses
ID_SECT_I_VALUE	Value of the internal fixed radiuses in mm
ID_SECT_POS	Define for which cut the positioning is valid, where **strid** could be c_sector_tposall = All cuts (main and trim) defined c_sector_tposmain = Only main cut defined c_sector_tpostrim = All trim cuts defined
ID_SECT_SPEEDPOS	Positioning speed in m/min

If **SortOfObject** is *A S C H*

Value

ID_EVTACT	Defines an Event for the working step
ID_NOMEOBJ	Change the virtual name of the working step. In **Name** you define the working step number, when 1 means Main Cut, 2 means first trim cut, and so on.
ID_PRIORITY	Defines a priority to the working step specified in **Name.**
ID STATEGY	Remove specified working steps. Possible **strid** are: c_remove Remove the working step specified in **Name**. c_todo Execute the working step specified in **Name** for a working step specified in **Name**

		If no ID_STATEGY is specified for a Working step, then the **default c_todo** is automatically taken.
	ID_TEC	Set one or more technology parameters

- **JE_ClosePiece** function

Syntax: **JE_ClosePiece&**
(byval PieceName as string)

Returns: The function returns 0, if there are no errors, non-zero otherwise.

Comments: This function closes the PIECE description file, which is currently open, and closes the communication with the PIECEDITOR. Always use this function.

Example: ok = JE_ClosePiece(je_piece)

- **JE_Create** Function

Syntax: **JE_Create&**
(byval SortOfObject as long,
byval PieceName as string,
byval GroupName as string,
byval WorkName as string)

Returns: The function returns 0, if there are no errors, non-zero otherwise.

Comments: This is a general-purpose function, which is used to create an object in the Piece Editor. Before an attribute of an object can be defined, it must be created. The object is specified in **SortOfObject** and may be one of the following :

Value	
WORK	Create a work with the name specified in WorkName.
GROUP	Create a group of works with the name specified in GroupName.

PieceName is always set to **je_piece**

GroupName is the name of the GROUP to be created, otherwise is set to **je_grp**

WorkName is the Name of the WORK to be created; otherwise it is set to **NULL**.

Example: To define a group of works, following sentences are needed:

```
ok = JE_Create(GROUP, je_piece, "Lav_Matrici", NULL)        'This creates a GROUP
                                                              "Lav_Matrici"
     ok = JE_Create(WORK, je_piece,"Lav_Matrici","lav1")    'This creates a WORK "lav1" into
                                                              GROUP "Lav_Matrici"
     ok = JE_Create(WORK, je_piece,"Lav_Matrici","lav2")    'This creates another WORK into
                                                              GROUP "Lav_Matrici"
```

- **JE_Create** (continuation 1)

Remark: **It's not possible to create GROUPs of a GROUP.** Do not program GROUPs if they are not strictly necessary. **Object inheritance** will only be applied during Workpiece generation of CAMLINK, and not by User intervention on AGIEVISION, afterwards. So the advantage to use GROUPs is small.

- **JE_CreatePoint** Function

Syntax: **JE_CreatePoint&**
(Name as string,
byval PieceName as string,
byval GroupName as string,
byval BeazName as string)

Returns: The function returns 0 if there are no errors, non-zero otherwise

Comments: This function is used to generate a Point in a work for use with a Sector or an Event

Name is the name of the Point. 19 characters (i.e. “first point”) is the maximal length.

PieceName is always set to je_piece.

GroupName is eventually the Group name, where the Point is created.

BeazName is the name of the WORK where the Point is created.

Example ok=JE_CreatePoint(“pt1”,je_piece,je_grp,”lav_d1”)
This will create a point called “pt1” to use for a sector or an event for the work “lav_d1”
If the WORK is part of a GROUP don’t forget to enter the name of the group also.

- **JE_CreateQuality** Function

Syntax: **JE_CreateQuality&**
(byval PieceName as string,
byval BeazName as string,
byval ParamList as string,
byval UserName as string)

Returns: The function returns 0 if there are no errors, non-zero otherwise.

Comments: This function is used to generate a quality name in the PIECEDITOR.

PieceName is always set to je_piece

BeazName is the name of the quality that YOU propose (i.e. “QUALITY P”)

ParamList is a list of possible values for Ra, Te and Tkm (i.e. “2.3,40.0,30.0,F,F,F”). The complete list of possible values can be found at chapter 4.7. The last three parameters belong to Speed, High Quality and a reserved parameter which is always set to False. Possible values for the parameters 4 and 5 are True(T) or False(F). They can be set both to **True** or both to **False**, or one of them True and the other False. For compatibility reasons **ParamList** can also be written without the last three parameters.

Possible variables for **UserName** are je_q1, je_q2 and je_q3.
UserName is the true name of the quality proposed firstly by **BeazName**.

If the proposed name given in **BeazName** is not found on the machine or the name exists with the same **ParamList** values then the existing name on the machine is taken.
If the name already exists on the machine and the values are different, then **BeazName** is changed automatically to **BeazName_1.** (“_1” has been added to the name given by **BeazName**) and stored into the variable **UserName**.
After this the new quality name **UserName** exists on the machine and could be used by other following programs. In this way you will be always sure that the called quality on the SBL will ALWAYS be present on the machine and the User has not to bother with the exact name of the quality stored on each different machine. (see example **A**)

If the User knows exactly the name of the quality on the machine, then JE_CreateQuality can be left out. Instead put the name of the quality in place of je_q1 in ID_QUALITY of JE_AttribObject. (see example **B**)

Example **A)**:

ok = JE_CreateQuality(je_piece,”BEST”,”1.8,12.5,10.0,T,T,F”, je_q1)
will create a quality with the name “BEST”, having Ra=1.8µ, Te=10.0-15.0µm, and Tkm=10.0 µm, Speed = True and High Quality = True

ok =JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”mach1”,NULL,**ID_QUALITY**,je_q1, je_dim)
will associate the quality “BEST” to the work “mach1”

or

Example **B)**

ok =JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”mach2”,NULL,**ID_QUALITY**, ”tec2ns”,je_dim)
will associate the existing quality “tec2ns” on the machine to the work “mach2”

- **JE_CreateSector** Function

Syntax: **JE_CreateSector&**
(Name as string,
byval PieceName as string,
byval GroupName as string,
byval WorkName as string)

Returns: The function returns 0 if there are no errors, non-zero otherwise.

Comments: This function is used to generate a sector on a work. The number of different sectors in a WORK is unlimited and they can overlap or contain other sectors.

PieceName is always set to je_piece.

GroupName is eventually the Group name, where the Sector is created.

WorkName is the name of the WORK where the Sector is created. The name of the WORK can't be NULL.

- **JE_CreateSector** Function (continuation 1)

Examples: ok=JE_CreateSector(“s1”,je_piece,je_grp,”lav_d1”)
This will generate a Sector in the WORK “lav_d1” with the name “s1”

- **JE_CreateStartPoint** Function

Syntax: **JE_CreateStartPoint&**
(byval SortOfObject as long,
byval Name as string,
byval PieceName as string,
byval GroupName as string,
byval WorkName as string)

Returns: The function returns 0, if there are no errors, non-zero otherwise.

Comments: This is a general-purpose function, which is used to create a startpoint object in the Piece Editor. The object is specified in **SortOfObject** and may be one of the following :

Value	
PIECE	Create a startpoint of piece with the name specified in **Name**.
GROUP	Create a startpoint of group with the name specified in **Name**.
WORK	Create a startpoint of work with the name specified in **Name**.

PieceName is always set to je_piece

GroupName is eventually the Groupname where the Work is defined.

WorkName is the name of the WORK where the Startpoint is defined

Example: ok=JE_CreateStartPoint(PIECE,”stpp”,je_piece,je_grp,NULL)
ok=JE_CreateStartPoint(GROUP,”stpg”,je_piece,”group1”,NULL)
ok=JE_CreateStartPoint(WORK,”stpw1”,je_piece,je_grp,”work1”)

- **JE_GenerateAttrib** Function

Syntax: **JE_GenerateAttrib&**
(byval AttributeType as string,
byval AttributeValue as long)

Returns: The function returns 0, if there are no errors, non-zero otherwise.

Comments: This is a general-purpose function used to set the way the technology is associated to the Piece
(Attention**:** The **JE_GenerateAttrib** function must be used ALWAYS before the **JE_GenerateCuts** function!).
A good place would be just before the first statement of the piece, especially when this attribute is valid for all the works.

All three **AttributeType**s should be used together.

AttributeType is the kind of attribute you want to set and will be one of the following:

Value

A) **c_tecauto** with or without user-interaction

B) **c_tecassign** general information

C) **c_tecalert** behaviour if the technology is not found

D) **c_tecuser** **new from V0304.** Behaviour in technology association for pocketings.

AttributeValue is the value of attribute you want to set and will be one of the following:

For ***c_tecauto*** :

Value

1) c_tecauto_f manual technology selection.

2) c_tecauto_t automatic technology selection.

For ***c_tecassign***

Value

1) c_tecass_da only if AGIE DB is found.

2) c_tecass_fi first in any case.

3) c_tecass_auto automatic save if technology is just assigned.

4) c_tecass_nauto no automatic save if technology is just assigned.

For ***c_tecalert*** :

Value

1) c_tecalert_not not assign if AGIE DB is not found.

2) c_tecalert_sea interaction if not found.

3) c_tecalert_alert alert if any component is not found.

For **c_tecuser** :

1) “0” do not generate a new technology with reduced parameters
2) “1” behaves like AGIEDB, by adapting technology parameters and thus generating a new technology with the **newname = oldname+_1**

Examples: ok=JE_GenerateAttrib(c_tecauto, c_tecauto_t) (**A2**)

ok=JE_GenerateAttrib(c_tecassign, c_tecass_fi) (**B2**)

ok=JE_GenerateAttrib(c_tecalert, c_tecalert_sea) (**C2**)

ok=JE_GenerateAttrib(c_tecuser,"1") (**D2**)

- **JE_GenerateCuts** Function

Syntax: **JE_GenerateCuts&**
(byval SortOfObject as long,
byval PieceName as string,
byval GroupName as string,
byval WorkName as string,
byval DBName as long,
byval UserName as string)

Returns: The function returns 0, if there are no errors, non-zero otherwise.

Comments: The object is specified in **SortOfObject** and may be one of the following:

Value	
PIECE	Create the technology for all WORKs and GROUPs into the piece. Place the function at the end of the SCRIPT, before JE_ClosePiece(je_piece).
GROUP	Create the technology for all works into the group. Place the function at the end of the WORKs of the same GROUP.
WORK	Create the technology for the work. Place the function at the end of the WORK attributes.

PieceName is always set to **je_piece**.

GroupName is eventually set to the Group Name, otherwise it is set to **je_grp**

Workname is the name of the WORK, if the SortOfObject is WORK, otherwise it is set to NULL

The database to query is specified in **DBName** and may be one of the following:

Value	
ASAGIE	The AGIE technology database. The quality to associate can be created with JE_CreateQuality.
ASUSER	The User technology database. The quality to associate must already exist on the machine. **The name used for the User technology cannot be longer than 14 characters**.
ASDELETE	Initialise the cut parameters. This is always set before ASAGIE and ASUSER
ASREMOVE	**new in V0304.** Removes unwanted working steps as defined in previous "…ID_STATEGY,c_remove…". See ID_STATEGY

Examples: ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASDELETE,NULL)
ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASAGIE,NULL)

ok=JE_GenerateCuts(WORK,je_piece,je_grp,”work1”,ASDELETE,NULL)
ok=JE_GenerateCuts(WORK,je_piece,je_grp,”work1”,ASAGIE,NULL)

---

ok=JE_GenerateCuts(WORK,je_piece,”group1”,”work2”,ASDELETE,NULL)
ok=JE_GenerateCuts(WORK,je_piece,”group1”,”work2”,**ASUSER**,”tec2ns”)

-----Removing **Usertec** working steps ----------

ok=JE_AttribObject(ASCH,SETATTR,je_piece,"group1","work2","1",
ID_STATEGY,**c_remove**,je_dim)
ok=JE_GenerateCuts(WORK,je_piece,”group1”,”work2”,**ASREMOVE**,”tec2ns”)

-----Removing **AGIE DB** working steps ----------

ok=JE_AttribObject(ASCH,SETATTR,je_piece,"group1","work2","1",
ID_STATEGY,**c_remove**,je_dim)
ok=JE_GenerateCuts(WORK,je_piece,”group1”,”work2”,**ASREMOVE**,NULL)

When AGIEDB working steps are removed no new technology files are generated, as for usertecs. The AGIEDB files are changed only for the defined WORK. If several WORKs need to have removed unwanted working steps, then above sentences with ID_STATEGY and ASREMOVE must be repeated for each WORK.

- **JE_Initiate** Function

Syntax: **JE_Initiate& ( )**
(& means that the function data type is long **)**

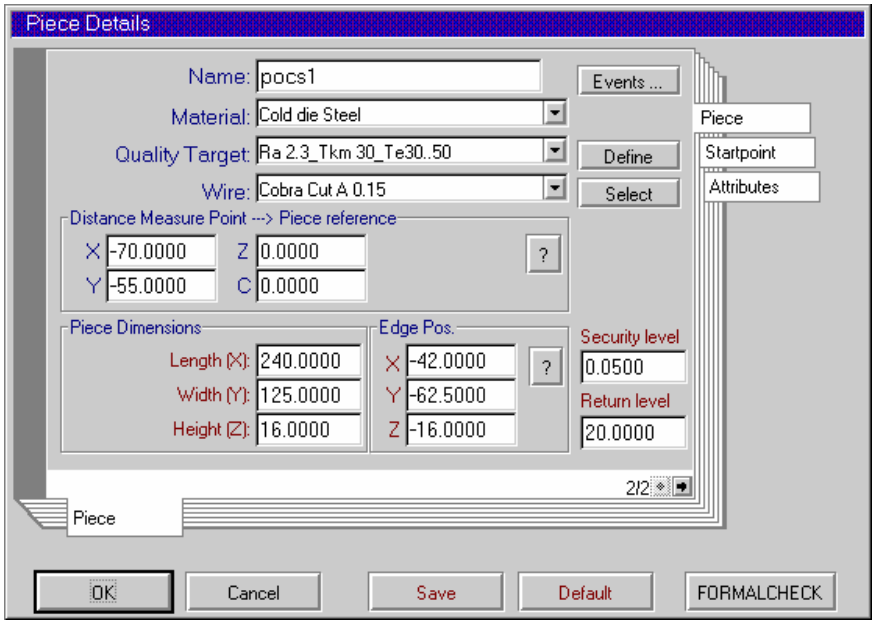
Returns: The function returns 0, if there are no errors, non-zero otherwise.

Comments: This is a special function, which is used to initialise the value of some variables in the basic script.

Example: ok = JE_Initiate

4.6 Commands and attributes of a scriptfile program

4.6.1 PIECE related attributes



4.6.1.1 Name of the PIECE

Set the name of an object by:

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_NOMEOBJ**,"piece1", je_dim)

This name will be the object name on AGIEVISION. The default name is taken from the AGIEVISION Configuration.

4.6.1.2 Material

Material of the pieces

The materials of the pieces are defined in a technological database. For example 'Cold die Steel' (X155CrVMo121) as the workpiece material is given by

ok=JE_AttribObject(PIECE,SETATTR,je_pieceje_grp,NULL,NULL,**ID_MATERIAL**,"0001",je_dim,)

The default material is "Cold die steel". For a complete list see Chapter 5

4.6.1.3 Surface quality

Surface quality of a whole workpiece

The desired technologies are defined in a database inside the AGIEVISION. For example ‘Ra 1.8’ as the roughness Ra (µm), ‘Tkm 10’ as the tolerance Tkm (µm) and ‘Te10-15’ as the corner deviation TE (µm) are given by

ok=JE_CreateQuality(je_piece,”Q1”,”1.8,12.5,10.0,F,F,F”,je_q1)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_QUALITY**,je_q1,je_dim)

The Parameters inside the ParamList mean:

Parameter 1:	**Ra**	- Roughness
Parameter 2 :	**TkM**	- Tolerance of form
Parameter 3 :	**Te**	- Corner precision
Parameter 4 :	**Speed**	- Priority for Speed
Parameter 5 :	**High Quality**	- Priority for high quality
Parameter 6 :	Not used, always False	

Possible values for parameter 4 and 5: True (T) or False (F)

They can both be true or both be false or only one of them true or false. The parameters have to be set in any case for this new AGIEVISION Version.

This command will not be compatible to versions before 02.06, this means that when a SCRIPT is made, it MUST BE CLEAR FOR WHICH AGIEVISION VERSION it is intended.

An older script is compatible to new Version **03.04**.

Due to inheritance (see Chapter 2), all the subsequent machinings will have the same surface quality, if not otherwise stated. **The surface quality depends from the available technologies and the machine type. For a complete list see** Chapter 5

The default quality is “Ra 2.3_Tkm 30_Te30...50”

4.6.1.4 Wires

Wires (material & diameter)

The wires are defined in a technological database inside the AGIEVISION. See Chapter 5 for a complete list. For example ‘Cobra Cut D’ as the wire material and ‘0.25’ (∅ mm) as the wire diameter are given by

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,
ID_THREAD,”Cobra Cut D 0.25”,je_dim)

The default wire is “Cobra Cut A 0.25”

4.6.1.5 Positioning the PIECE

Relative to the measurable Point

The positioning of a piece (X50, Y25, Z30, A0.5, B0.2, C45.0) is relative to the measurable point, which in turn is relative to the machine 0 Reference. The co-ordinates of the measurable point are defined in the Piece-Correction.

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_POSX**,"50",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_POSY**,"25",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_POSZ**,"30",je_dim)
A **positive** value will move the PIECE in direction of the **positive** axis.

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_POSA**,"0.5",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_POSB**,"0.2",je_dim)

A **positive** value of A and B-Axis will rotate the piece in **Counterclockwise** direction when looking in direction of the **negative** X (for A) or Y (for B) axis

Rotation in C of the PIECE relative to the reference point of the PIECE:
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_ROTATION**,"45",je_dim)

A **positive** value will rotate the PIECE in **Counterclockwise** direction, when looking in **negative** direction of the Z-Axis

If an Auxiliary Axis is configured, the position is in mm for a linear Axis and in dec.degrees for a rotation axis.

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_POSA1**,"125.88",je_dim)

A **positive** value will rotate the piece in **Counterclockwise** direction, when looking toward the rotation device.

Default values are ALL = 0.

4.6.1.6 Piece dimensions

Used only for visual simulation

To make the graphic simulation more realistic, put the Length and Width of the PIECE.
E.g.: The dimensions 120x100 is given by:

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_DIML,"120",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_DIMB,"100",je_dim)

Default values are both = 100

4.6.1.7 Height of the Piece

Defines the general height of a piece. The value equal or less than **0** is **not allowed**. Only one value is allowed for each piece. E. g. the height attribute of a 50 mm piece is given by:

ok = JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"50",je_dim)

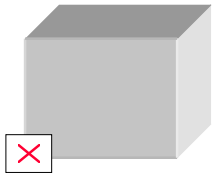
The max. workpiece height depends from the available machine type.

Setting this height will automatically set the Edge position (4.6.1.8) of the PIECE to the negative value of the height

Default value is 50 mm.

4.6.1.8 Edge Position

To position the reference of the PIECE correctly, you must tell where the left front bottom edge is placed in respect to the Piece reference. If the Piece reference would be on the left front bottom edge then the co-ordinate would be 0,0,0.



To position the Reference of the PIECE exactly in the centre of a cube 100x100x100:
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_POSPOSX**,"-50",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_POSPOSY**,"-50",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_POSPOSZ**,"-50",je_dim)

4.6.1.9 Security plane

The distance between the upper plane of the PIECE and the upper wire guide during erosion. With the AGIECUT CLASSIC the distance must be set to 0. The distance of 0.2mm is given by:

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_VALSECP**,"0.2",je_dim)

The default value is set on AGIEVISION.

4.6.1.10 Return plane

The distance between the upper plane of the PIECE and the upper wire guide during positioning inside the workpiece. The distance of 35mm is given by:

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_VALRETP**,"35.0",je_dim)

The default value is set on AGIEVISION.

4.6.1.11 Startpoint PIECE

Startpoint of a work relative to the piece reference

This is the point, where the wire will be threaded. Every workpiece can have as many startpoints defined as wished. To have a Startpoint relative to the PIECE reference, it must be generated for a PIECE:

ok=JE_CreateStartPoint(PIECE,"STP1",je_piece,je_grp,NULL)

Then the co-ordinates of the Startpoint must be given inside the WORK where it will be used:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,**ID_STP**,"STP1",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,**ID_STPMODE**,c_piece,je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","STP1",**ID_POSX**,"20",je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","STP1",**ID_POSY**,"10",je_dim)

When you look at AGIEVISION, you will notice a Startpoint "STP1" in the PIECE Details, but without co-ordinates. The co-ordinates will show up only in the WORKs where the Startpoint is used.

4.6.1.12 Strategy

Before the GRAFICHECK is made, the user can choose the strategy for the automatic sequence. There are 8 different strategies to choose from. This is the list of strategies with his code:

Machining strategy	A
Early	E
Late	L
Piece	W
Early piece	EW
Late Piece	LW
Piece Early	WE
Piece Late	WL

- ok=JE_AttribObject(PIECE**,**SETATTR,je_piece,je_grp,NULL,NULL**,ID_STATEGY**,"A"**,**je_dim)

where: **ID_STATEGY** is the **strid** for the Strategy to choose
"A" is the code for the strategy (e.g.: Machining sequence)

!! This sentence MUST be placed AFTER the JE_GenerateCuts and also AFTER the ID_ASG if present!!

4.6.1.13 Automatic Sequence Generator

On AGIEVISION the user can define his own User-Sequences. He will give them a suitable name to recognise them. This name can be called by Script, to apply the same sequence to new generated PIECE.

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_ASG**,"Mat4NsHm",je_dim)

This will call a usersequence with the name "Mat4NsHm" on AGIEVISION, after having associated the chosen technology with JE_GenerateCuts(...)

4.6.1.14 Order and Index of a piece

On the Piece List of AGIEVISION there are two new parameters, which help to better manage the different Pieces belonging maybe to the same project or customer order (ID_ORDINE), and to differentiate better identical PIECES but physically different and therefore having different Reference Corrections measured on a MMC. These attributes aren't objects and they can be defined only from externally (CAD/CAM or MMC).

To define an Order like "P3443":

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_ORDINE**,"P3443", je_dim)

To define an index like "22" to a PIECE:

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_INDICE**,"22",je_dim)

4.6.1.15 Events and actions for a PIECE

A lot of Events and Actions can be associated to the objects of AGIEVISION, giving easy and quick access to adaptation of all different situations that may occur. A list of most used events and actions are listed in Chapter 10.

To associate the action “Centering in a hole” at the Absolute Beginning of the Piece Erosion:

ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,**ID_EVTACT**,
“WEFA+8040+0;0;0;0;0;0;0;0;0;0;+”,je_dim)

4.6.2 GROUP related attributes

4.6.2.1 A group of standard works

To define a group of standard works the following sentences are needed:

ok = JE_Create(GROUP, je_piece, “Lav_Matrici”,NULL)	‘This creates a GROUP “Lav_Matrici”
ok = JE_Create(WORK, je_piece,”Lav_Matrici”,”lav1”)	‘This creates a WORK “lav1” into GROUP “Lav_Matrici”
ok = JE_Create(WORK, je_piece,”Lav_Matrici”,”lav2”)	‘This creates another WORK into GROUP “Lav_Matrici”

Remark: It’s not possible to create GROUPs of a GROUP. Use Groups only if strictly necessary.

4.6.2.2 A nocorecut group

No core Cut

AGIEVISION doesn’t create the calculated path by it’s own. The CAM-System must furnish the two geometries:

1. A nocorecut geometry with the optimised wirepath
2. A closed contour for the trim cuts.

All this information must be defined inside a special group: A nocorecut Group. To define it, enter the following lines:

ok=JE_Create(GROUP,je_piece,”groupname”,NULL)

ok=JE_AttribObject(GROUP,SETATTR,je_piece,”groupname”,NULL,NULL,
ID_SORTOF,c_pocketing,je_dim)

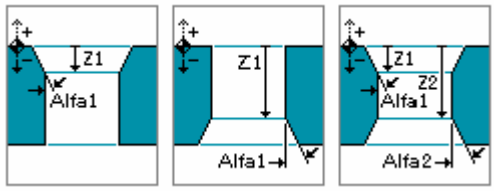
After these two lines the related works must be defined, as you can see in the example after 4.6.3.3

4.6.2.3 A collar group

Collar groups

There are three different collar types:

A) Open to the top
B) Open to the bottom
C) Open to both sides



c_collar1 c_collar2 c_collar3

These machinings are handled together, so a special group must be generated: a collar group. To define it, enter following lines:

ok=JE_Create(GROUP,je_piece,"collarname",NULL)
ok=JE_AttribObject(GROUP,SETATTR,je_piece,"collarname",NULL,NULL,
ID_SORTOF,c_collar,je_dim)

To tell AGIEVISION which type of collar is present, add the following line:

ok=JE_AttribObject(GROUP,SETATTR,je_piece,"collarname",NULL,NULL,
ID_COLLAR,c_collar1,je_dim) if it's of type **A**)
ID_COLLAR,c_collar2,je_dim) if it's of type **B**)
ID_COLLAR,c_collar3,je_dim) if it's of type **C**)

After these lines you have to enter the definitions for the machinings. See also chapter 4.6.3.30.

4.6.2.4 Other group attributes

All other group attributes

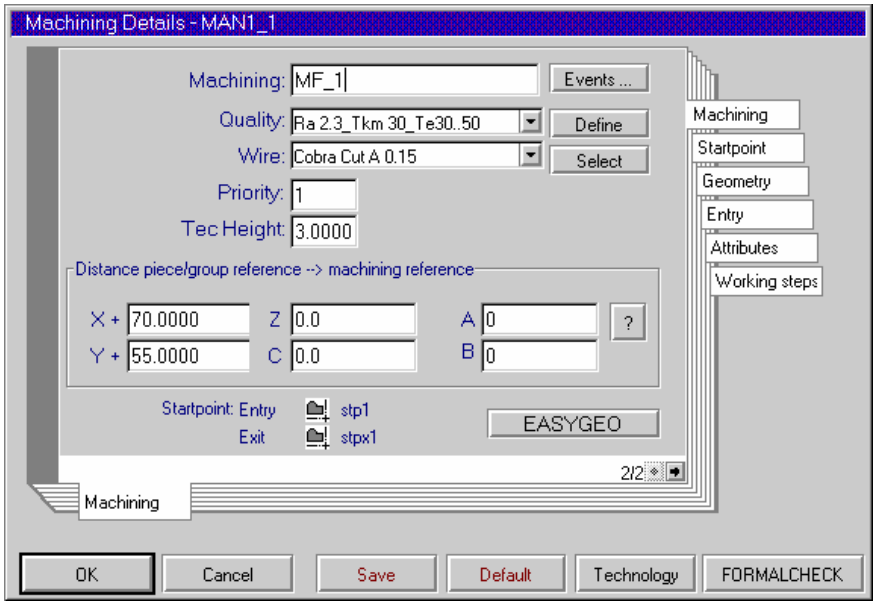
The remaining group attributes that can be defined are explained in the machinings, as they are exactly the same, with the difference that in place of
WORK you have GROUP,
je_grp you have the groupname.

E.g. the priority = 2 of a group "groupname" is given by:

ok=JE_AttribObject(GROUP,SETATTR,je_piece,"groupname",NULL,NULL,
ID_PRIORITY,"2",je_dim)

Whatever attribute is defined at group level, it will be inherited by the machinings and must not be redefined at CAD/CAM level. To see the possible attributes at group level see chapter 4.5.

4.6.3 WORK related attributes



4.6.3.1 The name of a machining

Machining

Any name can be used, with a maximal length of 19 characters. The name is given by:

ok=JE_Create(WORK,je_piece,je_grp,"lav_d1").

The Default Name is defined in AGIEVISION Configuration.

4.6.3.2 Positioning a WORK

Relative to the PIECE Reference

X-, Y-, Z- and C-Co-ordinates give positioning relative to the PIECE Reference. E.g.: To position a WORK X20,Y30,Z-20, A0, B0, C45 and AU1=90degrees relative to a PIECE Reference enter following lines:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_POSX**,"20",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_POSY**,"30",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_POSZ**,"-20",je_dim)

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_POSA**,"0",je_dim)

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_POSB**,"0",je_dim)

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_POSA1**,"90",je_dim)

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_ROTATION**,"45",je_dim)

Relative to the GROUP Reference

To position a WORK relative to a Group Reference, define the WORK inside a GROUP. The position of the GROUP is given similarly with ID_POSX, ID_POSY, ID_POSZ and ID_ROTATION.

4.6.3.3 Quality of machinings

Quality for simple machinings

The quality of a machining is done by choosing five parameters:

- Ra, Te, Tkm, High Speed and High Quality

Every machining can have his own quality target or you can have different GROUPs of machinings each with its own quality target. If all the machinings have the same quality target, it's enough to define the quality for the PIECE so that all the machinings will inherit this quality.

To be sure you'll find the quality on your AGIEVISION, it's better to create first the needed quality:

ok=JE_CreateQuality(je_piece,"Q1","0.3,4.0,6.0,F,T,F",je_q1)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_QUALITY**,je_q1,je_dim)

Don't forget to put the lines with JE_GenerateCuts(PIECE,,,,) at the end of the SCRIPT. See JE_GenerateCuts

Quality for nocorecuts

There are mostly two machinings involved with no core cut: one pocketing geometry and one trimcut geometry. When a pocketing GROUP is made (see 4.6.2.2), AGIEVISION understands automatically what it has to do with the technological parameters. This means that you need to give only one quality for both machinings: the final quality target. On the next page you'll find a complete working example.

Note that its possible to decide if the technology association has to be done in the normal AGIE Database strategy for nocorecuts (adapting parameters and offset) and thus generating a new technology when User Technology is chosen, or if the Usertec is taken as is.

Quality of collar types

A collar GROUP can have two or three machinings involved. Each of these machinings can have their own quality target. Simply define the quality at GROUP level as described above in the Nocorecut GROUP, or define each machining separately, as you would do with normal machinings.

To automate the associations of the qualities see JE_GenerateAttrib.

```
'$Include "jescript.sbh"
sub main
  ok = JE_Initiate
  if (ok=0) then
   ok=JE_GenerateAttrib(c_tecuser,"0")   ' Take Usertec "user1" as is
   ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"testpoc",je_dim)
   ok=JE_Create(GROUP,je_piece,"pocgr",NULL)
   ok=JE_AttribObject(GROUP,SETATTR,je_piece,"pocgr",NULL,NULL,ID_SORTOF,c_pocketing,je_dim)
   ok=JE_Create(WORK,je_piece,"pocgr","poc")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_GEOMETRY,"AGIE.USING_poc.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_PUNCH,c_left,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_SORTOF,c_pocketing1,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_POSX,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_POSY,"0",je_dim)
   ok=JE_CreateStartPoint(WORK,"stpe",je_piece,"pocgr","poc")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_STPENTRY,"stpe",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_STPOPEN,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"pocgr","poc","stpe",ID_POSX,"0",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"pocgr","poc","stpe",ID_POSY,"5.5",je_dim)
   ok=JE_CreateStartPoint(WORK,"stpex",je_piece,"pocgr","poc")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_STPEXIT,"stpex",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","poc",NULL,ID_STPOPEX,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"pocgr","poc","stpex",ID_POSX,"0",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"pocgr","poc","stpex",ID_POSY,"5.5",je_dim)
   ok=JE_Create(WORK,je_piecename,"pocgr","pocns")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","pocns",NULL,
                                    ID_GEOMETRY,"AGIE.USING_pocns.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","pocns",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","pocns",NULL,ID_SORTOF,c_pocketing2,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","pocns",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","pocns",NULL,ID_POSX,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","pocns",NULL,ID_POSY,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","pocns",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp2",je_piece,"pocgr","pocns")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","pocns",NULL,ID_STP,"stp2",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,"pocgr","pocns",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"pocgr","pocns","stp2",ID_POSX,"0",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"pocgr","pocns","stp2",ID_POSY,"5.5",je_dim)
   ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASDELETE,NULL)
   ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASUSER,"user1")
   ok=JE_ClosePiece(je_piecename)
  else
    stop
  end if
end sub
```

4.6.3.4 Wires and diameters

Wires (material & diameter)

Each machining can be defined using his own wire or wire diameter. The substitution of the wire types is not done automatically.

The wires are defined in a technological database inside the AGIEVISION. For example 'Cobra Cut D' as the wire material and '0.25' (∅ mm) as the wire diameter are given by

```
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
                                 ID_THREAD,"Cobra Cut D 0.25",je_dim)
```

The default wire is the one defined in the PIECE. The name of the Wire types has to be given exactly as it is written in the table of possible wires at chapter 5

4.6.3.5 Priority

The priority given to a group of works or to a single work is for the erosion sequence

The priority is higher if the number is lower. Values start at 1. A WORK with ID_PRIORITY = “1” is eroded before the WORK with ID_PRIORITY = “2”.

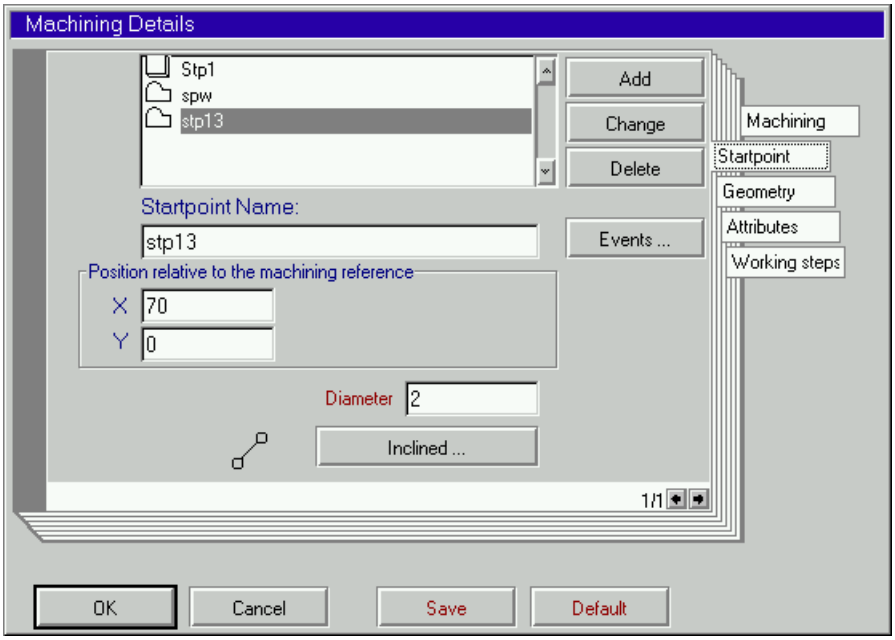
The priority for the machinings inside a collar group cannot be changed.

E. g. the priority attribute of 2 is given by

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”work1”,NULL,**ID_PRIORITY**,”2”,je_dim)

The default priority is 1.

4.6.3.6 Startpoint of WORK



Startpoint of a work relative to the work reference

This is the point, where the wire will be threaded. Every closed contour can have only one active startpoint defined or two if it’s an open one. To have a Startpoint relative to the WORK reference, it must be generated for a WORK:

Closed contours

The Startpoint “STP1” must be defined by:

ok=JE_CreateStartPoint(WORK,”STP1”,je_piece,je_grp,”lav_d1”)

Then the type of Startpoint must be given:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”work1”,NULL,**ID_STP**,”STP1”,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”work1”,NULL,**ID_STPMODE**,c_work,je_dim)

Finally the co-ordinates are defined:
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,”lav_d1”,”STP1”,
ID_POSX,”20”,je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,”lav_d1”,”STP1”,
ID_POSY,”10”,je_dim)

Open contours

E.g.: The Startpoint “STP_en” must be defined for the **Startpoint Entry** by:

ok=JE_CreateStartPoint(WORK,”STP_en”,je_piece,je_grp,”lav_d1”)

Then the type of Startpoint must be given:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”work1”,NULL,
ID_STPENTRY,”STP_en”,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”work1”,NULL,**ID_STPOPEN**,c_work,je_dim)

Finally the co-ordinates are defined:
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,”lav_d1”,”STP_en”,
ID_POSX,”20”,je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,”lav_d1”,”STP_en”,
ID_POSY,”10”,je_dim)

The EXIT Startpoint has always to be defined:

E.g.: The Startpoint “STP_ex” must be defined for the **Startpoint Exit** by:

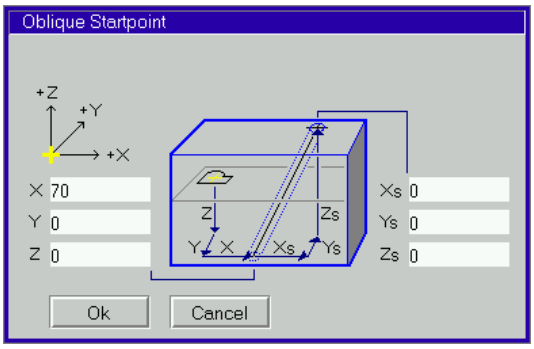
ok=JE_CreateStartPoint(WORK,”STP_ex”,je_piece,je_grp,”lav_d1”)

Then the type of Startpoint must be given:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”work1”,NULL,
ID_STPEXIT,”STP_ex”,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”work1”,NULL,**ID_STPOPEX**,c_work,je_dim)

Finally the co-ordinates are defined:
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,”lav_d1”,”STP_ex”,
ID_POSX,”50”,je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,”lav_d1”,”STP_ex”,
ID_POSY,”10”,je_dim)

Inclined Startpoint



The wire can be thread with the upper wire-guide displaced in X,Y in respect to the lower wire guide. This is a semi-automatic process.

The startpoint for the **lower** wire-guide has the same definition as a normal Startpoint, with ID_POSX, ID_POSY and ID_POSZ, only that ID_POSZ isn’t used. As we have an inclined situation, it is very important to position also the **lower** Startpoint to the correct Z-Height. Remember that this Z-Height is depending from the Workpiece Reference when ID_STPMODE is c_piece, and from the Machining Reference when ID_STPMODE is c_work...

Create the Startpoint for the lower and upper position:

ok=JE_CreateStartPoint(WORK,"Stp1",je_piece,je_grp,"Work1")

Inclined Startpoints (continuation)

Define the lower Startpoint position:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"Work1", NULL, **ID_STP**, "Stp1", je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"Work1", NULL, **ID_STPMODE**,
c_work, je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp, "Work1", "Stp1", **ID_POSX**,
"0", je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"Work1","Stp1", **ID_POSY**,
"0", je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp, "Work1", "Stp1", **ID_POSZ**,
"0", je_dim)

The Upper Startpoint is defined by the new parameters ID_POSX_S (Xs), ID_POSY_S (Ys) and ID_POSZ_S (Zs). They are INCREMENTAL to the lower startpoint

Define the upper Startpoint position:

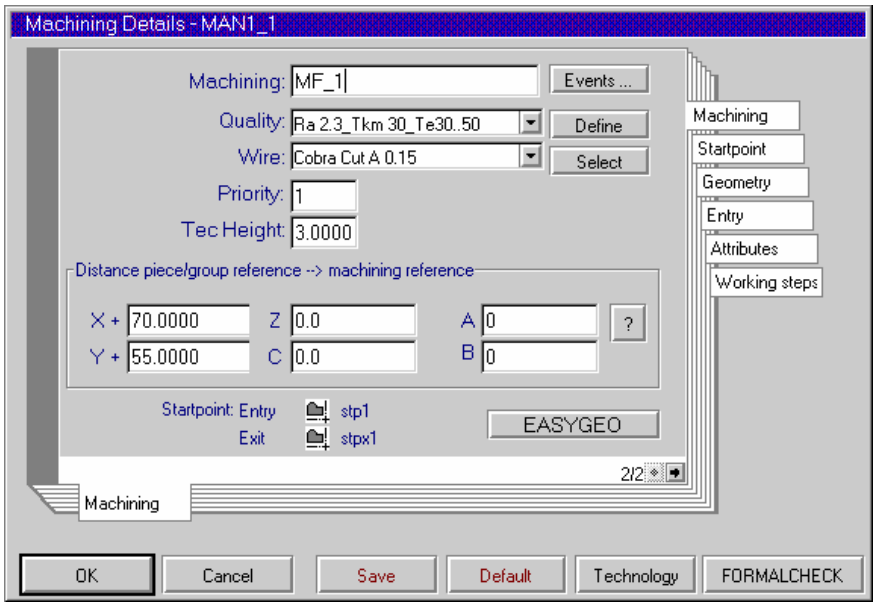
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"Work1","Stp1",**ID_POSX_S**,
"10",je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","Stp1",**ID_POSY_S**,
"10",je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"Work1","Stp1",**ID_POSZ_S**,
"50",je_dim)

4.6.3.7 Starthole diameter

E. g. the diameter attribute of the threading hole = 2mm is given by

ok = JE_CreateStartPoint(WORK,"stpg",je_piece,je_grp,"lav_d1")
ok = JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"lav_d1","stpg",
ID_DIAMETER,"2",je_dim)

Geometry details



4.6.3.8 Call a geometry (V/ISO-Code file)

Geometry call inside the SCRIPT

Each machining or WORK defined inside the SCRIPT must be associated with a geometry (V/ISO – file). E.g.: a geometry with the name “test0203.ISO” is given by:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”lav_d1”,NULL,
ID_GEOMETRY,”AGIE.USING_test0203.ISO”,je_dim)

This sentence must be placed right after the JE_Create(WORK….)

If the same Geometry is used, do not generate a new Geometry, but call the existing one moving to a new Machining Reference (ID_POSX…). This can be done also if the co-ordinates of the V/ISO are absolute, because they depend from the Machining Reference.

Geometry referenced in the Reference Script file (*.SBR)

Each different geometry (V/ISOfile) used inside the SCRIPT **must** be referenced in the SBR-file (see 3.2) as follows (**Case sensitive**!):

AGIE.USING_test0203.ISO IMPORT test0203.ISO;

Note the ‘;’ at the end of the sentence: **Don’t put any spaces between ISO and ; !!**

Each new geometry (V/ISO-file) must be placed on a new line.

4.6.3.9 Punch/Die

For closed contours

A closed contour or geometry can be one of two types:

Punch
Die

A punch is given by:
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”lav_d1”,NULL,
ID_PUNCH,c_punch,je_dim)

A die is given by:
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”lav_d1”,NULL,
ID_PUNCH,c_die,je_dim)

The default is die.

4.6.3.10 Left/Right

For open contours

An open contour or geometry can be one of the following:

Left, if the offset will be on the left side of the erosion path
Right, if the offset will be on the right side of the erosion path

Wire placed to the right side of the geometry path is given by:
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”lav_d1”,NULL,
ID_PUNCH,c_right,je_dim)

Offset to the left is given by:
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
ID_PUNCH,c_left,je_dim)

Default is left.

4.6.3.11 Reverse Cut

Reverse cut strategy

The strategy for moving back and forth on a contour during trim cuts can be entered by the attribute ID_REVCUT, where "T" means TRUE (Reversecut: Yes) and "F" for FALSE.

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_REVCUT**,"T",je_dim)

This attribute is valid for closed and open contours.

Default is False.

4.6.3.12 No inversion Cuts

Defines the number of trim cuts starting from the last one, which shouldn't be eroded with reverse cut strategy. E.g.: Don't erode the last two trim cuts in reverse cut strategy:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
ID_ASWITHOUT,"2",je_dim)

The default value is 0.

4.6.3.13 Minimum radius last cut

Behaviour when radius smaller than offset especially for last trim cut.
If the value is set to "T":

No radius is made and the line segments are shortened. Only the wire-radius (with gap) will result in the corner.

If the value is set to "F":

If the radius is smaller than the offset, there will appear an error message on AGIEVISION: "Minimal radius or fixed radius less than the offset"

E.g.: the flag for the minimal radius has to be set:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
ID_RADIUSMINLA,"T",je_dim)

The default value is "F" for False

4.6.3.14 Separation Cut

This attribute defines the distance to be left for separation cuts. The following example defines a 1mm long separation cut.

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_SEPCUT**,"1",je_dim)

This distance is absolutely needed if the type of work is a Punch. The operator defines the default value for dies.

4.6.3.15 Clearance

Clearance in mm between PUNCH and DIE

The clearance is per definition positive. If a negative value is given, then you'll get an oversized PIECE. E. g. the clearance attribute of 0.005 mm is given by

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,
ID_CLEARANCE,"0.005",je_dim)

A **positive** value will make a **punch smaller** and a **die larger**. The default value is 0.

4.6.3.16 Clearance increment

Clearance increment in mm

The Clearance increment is per definition positive. If a negative value is given, then you'll get an oversized separation cut.
In case of a value different than 0, the separation cut will be executed only with a main cut and no trim cuts. E.g. the clearance increment attribute of 0.05mm is given by

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,
ID_CLEARANCETRENN,"0.05",je_dim)

If the value is **positive**, then a **punch** will become **smaller** at the beginning of the separation cut.

4.6.3.17 Entry/Exit to the contour

Erosion entry strategy

It is possible to define in which way the wire should enter the contour.

- Straight-line perpendicular:
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_ENTRYMODE,c_entper,je_dim)
  If it's not possible to enter completely perpendicular, then it will move with the shortest distance at offset distance near the element (**Attention!! This will mean that the resulting distance is TWICE the offset from the contour!).** Here it will enter perpendicularly.
- Tangential to the first element with a small radius:
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_ENTRYMODE,c_enttan,je_dim)

  The **Entry** Radius is defined by ID_TANGUSERE:

  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL, **ID_TANGUSERE**,
  "0.235",je_dim)

  The **Exit** Radius is defined by ID_TANGUSERU:

  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL, **ID_TANGUSERU**,
  "0.230",je_dim)
- Free entry to the first element (shortest distance to the element)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_ENTRYMODE,c_entlib,je_dim)

4.6.3.18 Entry distance A and B

Deviation point from startpoint to contour entry

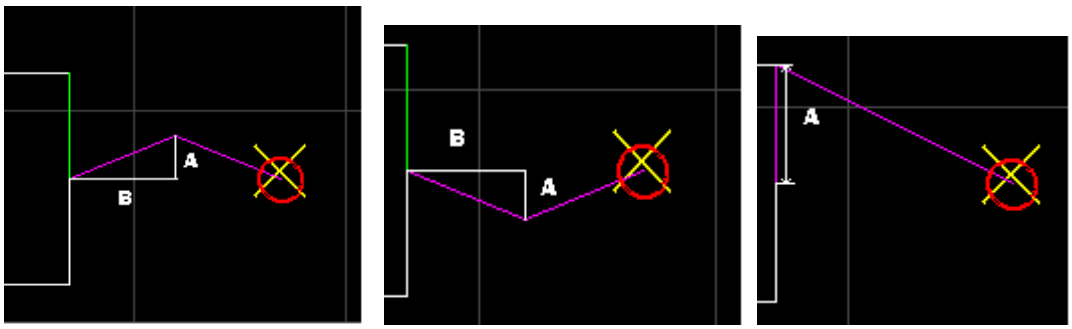
Not always the startpoint is a straight line to the contour entry, or is made of one single movement direction. With the help of two parameters, A and B, the entry movement can be modified.

Parameter A is the displacement to the entry point in the direction of erosion of first element. The value is in mm. Positive values are in the same direction from entry-point as erosion goes.

Parameter B is displacement of the movement to the entry-point in perpendicular direction of the first erosion element. The value is in mm. Positive values are in the startpoint direction.

Setting also the parameter for new entry distance (4.6.3.19), the contour entry point will move first and only afterwards the entry distance A and/or B is applied.

Ex.: A = 2 and B = 5 A = -2 and B = 5 A = 10 and B = 0



ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_**SETENTA**,"2",je_dim)

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_**SETENTB**,"5",je_dim)

4.6.3.19 New Entry distance from previous point

Moving the entry point from previous location

A positive value will move the entry point in erosion direction defined by V/ISO. This value is applied before the entry distance A and B in 4.6.3.18. To move the entry point by 5 mm:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”work1”,NULL,**ID_SETENTM**,”5”, je_dim)

4.6.3.20 Incrementing the entry point at each trim cut

At each Trim cut a new entry point

When the entry point has to be moved at each trimcut, following sentence can be entered:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,”work1”,NULL,**ID_SETENTD**,”0.2”, je_dim)

4.6.3.21 Commutation Points

The entry and the Exit strategy can be influenced also by adapting the technological parameters to avoid wire-breaks. The modifications have effect until the wire reaches the commutation Point for the Entry and as soon as it reaches the commutation Point for the Exit. E.g.: to enter a distance of 2.5mm after the contour entry and 3.1 mm before the contour exit:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
ID_COMMPOINTENTRY,"2.5",je_dim)

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
ID_COMMPOINTEXIT,"3.1",je_dim)

A negative value in **ID_COMMPOINTENTRY** will move the commutation point from the beginning of the contour towards the Startpoint, and after the contour end towards the exit Point for **ID_COMMPOINTEXIT**.

4.6.3.22 Entry Element

Entry to an element of a closed contour

This attribute has to be used always when there is a closed contour. The entry element of the contour does not have to be the first element. It is possible to define any other element as the entry element of the contour with an input of the sentence number of the desired element. For example the entry to an element in sentence Nr. 14 (N0014) of the V/ISO-code is given by

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,**ID_ENTRY**,"14", je_dim)

Default value is 0.

Entry of an open contour

In this case the first element is automatically chosen. If you set this attribute, it will be ignored.

4.6.3.23 Taper

Type of a conic (tapermode)

There are three different taper modes:

- **Standard**: Tapervalue constant on whole contour.
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
ID_TAPERMODE,c_stdcon,je_dim)

- **Iso**: Upper radius value same as lower radius on whole contour
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
ID_TAPERMODE,c_isocon,je_dim)

- **Fix**: Upper wire-guide always in same tilted position relative to lower wire-guide.
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
ID_TAPERMODE,c_fixcon,je_dim)

This attribute has to be set before using ID_TAPER.

Taper value and Taper height

After having defined the type of taper, the value of the taper must be entered. **Positive** values define the cone **open to the top**, while **negative** values define it **open to the bottom**.
Together with the taper value, also the height where this value is set is important, at least for standard and iso taper types.

E.g.: The height of 10 mm from the top of the contour toward the bottom, is given by:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_POSZ**,"-10",je_dim)

The taper value of 2 degrees (open to the top) is given by:

ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_TAPER**,"2",je_dim)

For fixed conic types the X,Y-Components of the taper must be given. The measure is also in degrees. The X and Y components are the same as the PIECE co-ordinate system. E.g.: A fixed taper of 4 degrees in X and 3 degrees in Y must be given by:
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_TAPER**, "4",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,**ID_TAPERP**, "3",je_dim)

If only an Y-Component is needed, it's necessary to put the X-Component nevertheless!
Inside the SCRIPT Sequence, the Y-Component must always follow the X-Component.

For **open contours**, a **positive** angle will move the upper wire guide to the **right** of the path.

4.6.3.24 Corners

External corners

This attribute is set for all those radii not programmed inside the geometry (V/ISO-file). There are three corners types:

- **Minimum radius**
  All the undefined corners are eroded with a minimal radius, defined by the offset and wire diameter.
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_E_TYPE,c_radius_rm,je_dim)

- **Sharp-edged radius**
  All the undefined corners are eroded with a sharp-edge:
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_E_TYPE,c_radius_sv,je_dim)

- **Fixed radius value**
  All the undefined corners are eroded with a user-definable radius value. E.g.: a radius value of 0.25 mm is given by:
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_E_TYPE,c_radius_rf,je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_E_VALUE,"0.25",je_dim)

Internal corners

This attribute is set for all those radii, which are not programmed inside the geometry (V/ISO-file). There are three types of corners:

- **Minimum radius**
  All the undefined corners are eroded with a minimal radius defined by the offset and wire diameter.
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_I_TYPE,c_radius_rm,je_dim)

- **Sharp-edged radius**
  All the undefined corners are eroded with a sharp-edge:
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_I_TYPE,c_radius_sv,je_dim)

- **Fixed radius value**
  All the undefined corners are eroded with a user-definable radius value. E.g.: a radius value of 0.25 mm is given by:
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_I_TYPE,c_radius_rf,je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,
  ID_I_VALUE,"0.25",je_dim)

4.6.3.25 Points

Points can be inserted into the geometry (V/ISO) as many as you need. For each point three parameters must be entered:

- Create the point giving it a free definable name (max. 19 characters). E.g.: Create point p1:
  ok=JE_CreatePoint(“p1”,je_piece,je_grp,”lav_d1”)
- Define on which geometric segment it has to lie. E.g. Segment no.3. Find out to which N-Bloc in the V/ISO-Code this segment belongs to and put in this number (e.g. N0005):
  ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,”lav_d1”,”p1”,
  ID_NSENTENCE,”5”,je_dim)
- Define at which percentage from the beginning of the segment the point is. E.g.: The percentage along the third segment (N0005) is 5.34%:
  ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,”lav_d1”,”p1”,
  ID_PERSENTENCE,”0.0534”,je_dim)

The values of the percentage range from 0 (0.00%) to 1 (100.00%). The direction from 0 to 1 is always in the programmed V/ISO direction, independently if afterwards reversecut or other methods will change it.

4.6.3.26 Sector types

Several attributes can be defined which are valid only for the particular sector of Geometry (V/ISO) chosen. The different sectors can also overlap each other, as long as they aren’t of the same type. As many sectors as needed can be defined. Each sector has firstly to be created:

ok=JE_CreateSector(“s1”,je_piece,je_grp,”lav_d1”)

At least two points (see 4.6.3.23) need to be created before defining a sector.

There are four types of sectors:

- **Clearance**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TYPE,c_sector_cle, je_dim)
- **Taper**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TYPE,c_sector_tap, je_dim)
- **Corners**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TYPE,c_sector_rad, je_dim)

- **Positioning without erosion**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TYPE,c_sector_pos, je_dim)

4.6.3.27 Initial and final sector points

The initial and the final point of the segment must be given. E.g.: Sector “s1” has the initial point “p1” and the final point “p2”:
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,s1”,**ID_SECT_PS**,”p1”,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,s1”,**ID_SECT_PF**,”p2”,je_dim)

4.6.3.28 Clearance Sector

The definition for the clearance of a sector is completed by his effective value. A positive value will generate a smaller punch. E.g.: The value of the clearance is 0.005mm:

ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
ID_SECT_CLEARANCE,”0.005”, je_dim)

4.6.3.29 Taper Sector

There are three different taper modes to be defined. In each taper mode the value of the taper must also be set. This is the same for Standard and Iso taper, but different for fixed conic. E.g.: A taper value of 2 degrees is given by:

- **Standard taper**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TAPERMODE,c_stdcon, je_dim)
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TAPERT,”2”, je_dim)
- **Iso taper**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TAPERMODE,c_isocon, je_dim)
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TAPERT,”2”, je_dim)

- **Fixed taper**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TAPERMODE,c_fixcon,je_dim)
  The X and Y-Components of the taper must be given.
  E.g.: 5 degrees in X direction and 3 degrees in Y direction:
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TAPERT,”5”,je_dim)
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,”lav_d1”,”s1”,
  ID_SECT_TAPERP,”3”,je_dim)

4.6.3.30 Corner Sectors

External corner sectors

This attribute is set for all those radii not programmed inside the specific sector of the geometry (V/ISO-file). There are three types of corners:

- **Minimum radius**
  All the undefined corners are eroded with a minimal radius, defined by the offset and wire diameter.
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_E_TYPE,c_radius_rm,je_dim)
- **Sharp-edged radius**
  All the undefined corners are eroded with a sharp-edge:
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_E_TYPE,c_radius_sv,je_dim)
- **Fixed radius value**
  All the undefined corners are eroded with a user-definable radius value. E.g.: a radius value of 0.25 mm is given by:
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_E_TYPE,c_radius_rf,je_dim)
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_E_VALUE,"0.25",je_dim)

Internal corner sectors

This attribute is set for all those radii not programmed inside the specific sector of the geometry (V/ISO-file). There are three types of corners:

- **Minimum radius**
  All the undefined corners are eroded with a minimal radius, defined by the offset and wire diameter.
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_I_TYPE,c_radius_rm,je_dim)
- **Sharp-edged radius**
  All the undefined corners are eroded with a sharp-edge:
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_I_TYPE,c_radius_sv,je_dim)
- **Fixed radius value**
  All the undefined corners are eroded with a user-definable radius value. E.g.: a radius value of 0.25 mm is given by:
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_I_TYPE,c_radius_rf,je_dim)
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_I_VALUE,"0.25",je_dim)

4.6.3.31 Positioning Sectors

Inside a path of geometry sometimes it's needed to move without erosion. Defining a positioning sector will do exactly this. There are three types of positioning movements:

- **Valid for all cuts**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_POS,c_sector_tposall,je_dim)
- **Valid only for the main cut**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_POS,c_sector_tposmain,je_dim)
- **Valid only for the trim cuts**
  ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
  ID_SECT_POS,c_sector_tpostrim,je_dim)

The speed of the positioning must also be given with each of above sentence. E.g.: a speed of 0.5m/min is defined by:

ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",
ID_SECT_SPEEDPOS,"0.5",je_dim)

4.6.3.32 Works inside special groups

Work in Collar groups

As described in 4.6.2.3 collar types of works must be defined inside a special collar group. As machining name we use "LC1" for upper conic, "LC2" for cylindrical part and "LC3" for lower conic. The three types of collar groups can have two (LC1/LC2, LC2/LC3) or three (LC1/LC2/LC3) machinings each. **Every machining or WORK** definition **must** include following sentences:

- Create the needed WORKs depending on the collar group chosen (see 4.6.2.3):
  ok=JE_Create(WORK,je_piece,"cgroup","LC1")
- Define the Geometry with ID_GEOMETRY
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC1",NULL,
  ID_GEOMETRY,"AGIE.USING_work1.ISO",je_dim)
  The geometries (V/ISO-files) for each machining (LC1,LC2,LC3) are always the **same**! Nevertheless each machining must contain this sentence again.
- Define the sort of collar machining (see fig. 1)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC1",NULL,
  ID_SORTOF,c_collar1,je_dim)
- Define all the normal attributes of a work like Entry, entry strategy, entry type, reverse cut strategy, separation cut distance, …
  Remember to place the groupname (e.g.: "cgroup") and the specific workname (e.g.:"LC1") for each attribute.
- Define the Height of the specific collar machining
  The different heights must be given taking into account the strategy used by AGIEVISION. For two machining collar types the height of the tapered part (LC1/LC3) is always the same as the height of the workpiece, when the cylindrical part (LC2) is the real height of the land.

- For three machining collar types the upper tapered part (LC1) is always the same as the height of the workpiece. The lower tapered part (LC3) is always the height of the workpiece minus the height of the upper tapered part, that is:

  Height LC3 = Height Workpiece – Height LC1

  because the lower conical part is eroded right after the upper tapered part. The cylindrical part (LC2) is eroded last, so the height is always the real cylindrical height of the land.

E.g.: We want to erode a three machining collar (c_collar3).

Height of the Workpiece: 50,
Landheight: 5,
Upper tapered machining height: 20
Lower tapered machining height: 25

```
ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC1",NULL,
                                    ID_HEIGHT,"50",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC2",NULL,
                                    ID_HEIGHT,"5",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC3",NULL,
                                    ID_HEIGHT,"30",je_dim)
```

- Define the position in Z of the specific collar machining
  The upper plane is at Z=0. From here the position in –Z1 is given to locate the programmed (cylindrical) geometry. For two machining collars the position in Z1 is always the same for both machinings and it's the height where the cylindrical machining (LC2) ends. See fig.1.

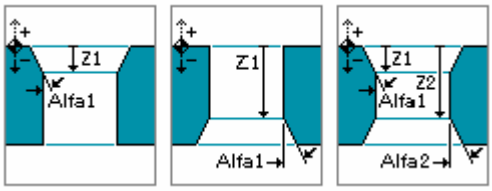


figure 1

E.g.: A three machining collar with upper tapered machining height = 20, land height = 10 and lower tapered machining=20 is given by:

```
ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC1",NULL,ID_POSZ,"-20",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC2",NULL,ID_POSZ,"-20",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC3",NULL,ID_POSZ,"-30",je_dim)
```

- Define the Tapermode of the specific collar machining

```
ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC1",NULL,
                                    ID_TAPERMODE,c_stdcon,je_dim)
```

- Define the Taper of the specific collar machining (e.g.: 2 degrees):

```
ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup","LC1",NULL,ID_TAPER,"2",je_dim)
```

- Define the quality of the specific collar machining if different from the GROUP quality

```
ok=JE_AttribObject(WORK,SETATTR,je_piece,"cgroup",LC2",NULL,ID_QUALITY,je_q2,je_di
m)
```

Nocorecut Works

To build a nocorecut work it's necessary to create a nocorecut group. This special group type is necessary for AGIEVISION to correctly interpret the technological settings and automatically adapt the parameters like the offset. This type of group is made of two different geometries (V/ISO), one for the nocorecut itself and one for the trim cuts. The trim cut geometry is not absolutely necessary, so if it's present in the SCRIPT-file then it's machined, otherwise only the main cut is done.

For a complete example of nocorecut work see page 31

4.6.3.33 Height of single works

To modify single heights of a WORK, which differs from the PIECE Height. Normally used in collar groups. Since **V0304** it's also modifiable from user on AGIEVISION. If a height of 0 is entered (or if this parameter is omitted), then the Workpiece height is taken.

ok = JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,**ID_HEIGHT**,"30",je_dim)

4.6.4 Other Startpoint related attributes

We have already described some of Startpoint attributes, like positioning (ID_POSX...) or inclined startpoints (ID_POSX_S...) in section 4.6.3.6.

There is one other important attribute to look at:

4.6.4.1 Linked Startpoints

Linking Startpoints together allows to position from one linked startpoint to the other without cutting the wire, see **fig.a**. We can have different independent families of linked startpoints, where moving inside the same family the wire isn't cut, but moving from one family to the other it will be cut.

There is also a way not to cut the wire when moving from one family to the other, see **fig.b**. In such cases a startpoint has to be associated to both families.

A Startpoint can have at maximum two families associated, see also 4.5.

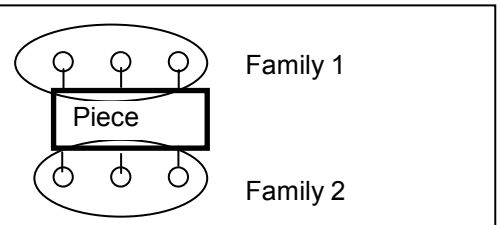
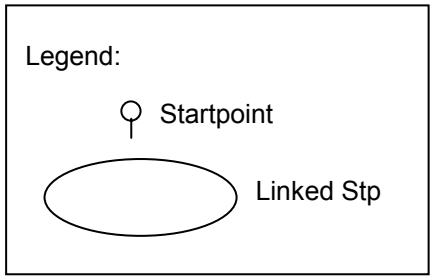


Fig.a



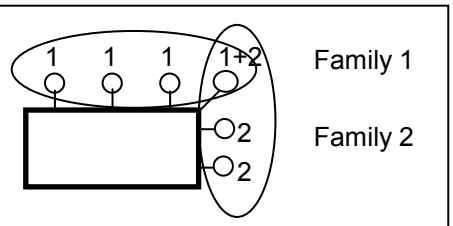


Fig.b

Startpoint "stp1" linked to family 1:

ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","stp1",**ID_STP_F1**,"**1**",je_dim)

Startpoint "stp2" linked to family 2:

ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","stp2",**ID_STP_F1**,"**2**",je_dim)

Startpoint "stp2" linked **also** to family 1:

ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","stp2",ID_STP_**F2**,"1",je_dim)

4.6.5 Working Steps related attributes

The Working step object is defined as **ASCH**. The attributes apply on one single working step: the one defined in **Name**. This **Name** is in reality a number, as you can see on following list:

4.6.5.1 Working step Name list

1	for Main cut
2 .. 9	for Trim cuts
101 .. 103	for Aux cuts, in particular:
101	for Broken thread
102	for Entry strategy
103	for Exit strategy

Working steps are created only after having associated a technology to the PIECE or to the WORK, so after having used ok=JE_GenerateCuts(...).

4.6.5.2 Events and Actions

Many Events and Actions can be defined for working steps. You can find them in Addendum A. Here is an example for a Stop on a point inside the contour.

E.g. Add a stop (point pt1) on the main cut (Name="**1**") in a place which is **not** at the separation cut distance (e.g. in N0032 at 50% of segment length):

ok=JE_CreatePoint("pt1",je_piece,je_grp,"work1")

ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"work1","pt1",**ID_NSENTENCE**,"32", je_dim)

ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"work1","pt1",**ID_PERSENTENCE**,"0.5", je_dim)

Then the Event and Action will be:

ok=JE_AttribObject(**ASCH**,SETATTR,je_piece,je_grp,"work1","**1**",**ID_EVTACT**,"**SERPpt1+8014+;+"** , je_dim)

4.6.5.3 Change all technology parameters on a point of the geometry

All technology parameters can be modified in a single command and on a previously defined geometry POINT. See JE_CreatePoint.

Several such points can be placed into the same Geometry, but not more than 8 can be placed on the same segment. The maximum number of points overall per geometry cannot exceed 90.

This is the syntax of the command:

ok=JE_AttribObject(**ASCH**,SETATTR,je_piece,je_grp,"work1","**1**",**ID_EVTACT**,"**SERPpt1+8007+t1; paramList;+",**je_dim)

t1 is the name of the working step added into the Notepad of AGIEVISION. **pt1** is the name of the POINT inside the Geometry. The parameter list **paramList** is a string, composed by 35 technology parameters, each separated by a semicolon. The parameters are in the following order:

I;P;td;Vs;ISH,Ton;Reg;UHP;PPV;**0;0;0;0**;Aw;Fw;**0;0**;ACO;ACOX;**0;0**;B;Q;p;K;**0;0**;Str;0;Mode;ULV;FLT;SPL;DLY;TNR

The values to be entered can be found in chapter 6 in Column "Value in SBL". The value **0** must be entered as **0** and can't be changed.

Example: ok=JE_AttribObject(**ASCH**,SETATTR,je_piece,je_grp,"work1","**1**",**ID_EVTACT**, _ "**SERPpt1+8007+t1;3;5;9;14;2;5;10;3;7;0;0;0;0;60;64;0;0;24;6;0;0;1;3;140;75;0;0;19;0;10002;0;0;13;0;0;+",** je_dim)

4.6.5.4 Change the name of the working step

The name visualised for the working step in AGIEVISION can be changed freely. To change the name of the first trim cut to “Special Main cut” use following sentence:

ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,”work1”,”**2**”,**ID_NOMEOBJ**,”Special Main cut”, je_dim)

4.6.5.5 Remove unwanted working steps

Splitting a machining which has associated a technology with 4 trimcuts, in 5 machinings, each of them having only one working step and assigning to each machining a different priority, will give you access to each single working step.

WARNING. This will generate a lot more machinings and eventually also a lot more technologies, depending if you are using user-technologies...

So the advantage of controlling each working step, will bring you other disadvantages, like more time consuming Script executions, bigger Workpiece description, heavier harddisk read/writings, many new technologies and the limit of 500 machinings per Workpiece is attained faster. Also the overview of the Workpiece structure is more difficult due to all machinings having only one single working step.

We know there can be reasons to use anyway this function, but be careful, and analyse in conjunction with the customer, if this is really needed. We have several approved and good tested strategies in AGIEVISION, which maybe are already doing the work, as the customer needs it.

This is how it works:

You’ll have to **know in advance** how many working steps the associated technology (AGIEDB or USERDB) will use. Then for each working step to remove, add following line **after** JE_GenerateCuts(...), changing only the Name as listed in 4.6.5.1:

ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"work1","**2**",**ID_STATEGY**,c_remove, je_dim)

ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"work1","**3**",**ID_STATEGY**,c_remove, je_dim)

Then remove the working steps as listed before. Remember to add the name of the Usertechnology or NULL when AGIEDB is used:

ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work1",**ASREMOVE**,"user1")

To define a priority to the remaining working step:

ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"proe_001","**1**",**ID_PRIORITY**,"10", je_dim)

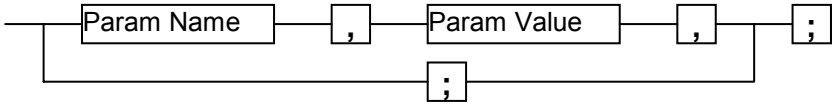
If you don’t want to generate a new technology for each c_remove, use c_tecuser as described in JE_GenerateAttrib.

4.6.5.6 Changing one or more technological parameters

After having associated the technology with JE_GenerateCuts(…), it's possible to modify one or more technological parameters for the specified working step. Following command is used:

ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"work1","1",**ID_TEC**,"**ParamList**", je_dim)

The **ParamList** has following syntax:



Parameter names are one of the following:

"I"

"P"

"td"

"Vs"

"ISH"

"Ton"

"Reg"

"UHP"

"PPV"

"Aw"

"Fw"

"ACO"

"ACOX"

"B"

"Q"

"p"

"K"

"Str"

"Ofs"

"Mode"

"SPL"

parameter value: All values are expressed in positions! See tables in chapter 6.

Example:

Set the parameters for **I** to 12 (pos=12), **td** to 84 (pos=54) and the **Offset** to 0.221 for Trimcut 1:

ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"Work1","2",**ID_TEC**, **"I**,12,**;td**,54,**;Ofs**,221,**;"**, je_dim)

4.6.6 Automatism of quality target association

4.6.6.1 User definable association

All technological parameters are stored in a database inside AGIEVISION. There are two databases: an AGIE database and a USER database. The association Window automatically opened on AGIEVISION when the AGIE database call is made, proposes 10 different technologies from which the operator can choose one. This window can appear for three different types of situations:

- Association to each single work from AGIE Database
  ok=JE_GenerateCuts(WORK,je_piece,je_grp,"lav_d1",ASDELETE,NULL)
  ok=JE_GenerateCuts(WORK,je_piece,je_grp,"lav_d1",ASAGIE,NULL)
- Association to a group of works from AGIE Database:
  ok=JE_GenerateCuts(GROUP,je_piece,"groupname",NULL,ASDELETE,NULL)
  ok=JE_GenerateCuts(GROUP,je_piece,"groupname",NULL,ASAGIE,NULL)
- Association to the whole piece with AGIE Database:
  ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASDELETE,NULL)
  ok=JE_GenerateCuts(PIECE,je_pieceje_grp,NULL,ASAGIE,NULL)

When a USER database is called, on AGIEVISION another chooser window appears: That for the usertechnology names. The operator can choose from one of his usertechnologies.

- Association to each single Work from USER Database with quality name "example":
  ok=JE_GenerateCuts(WORK,je_piece,je_grp,"lav_d1",ASDELETE,NULL)
  ok=JE_GenerateCuts(WORK,je_piece,je_grp,"lav_d1",ASUSER,"example")
- Association to a group of works from USER Database:
  ok=JE_GenerateCuts(GROUP,je_piece,"groupname",NULL,ASDELETE,NULL)
  ok=JE_GenerateCuts(GROUP,je_piece,"groupname",NULL,ASUSER,"example")
- Association to a group of works from USER Database:
  ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASDELETE,NULL)
  ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASUSER,"example")

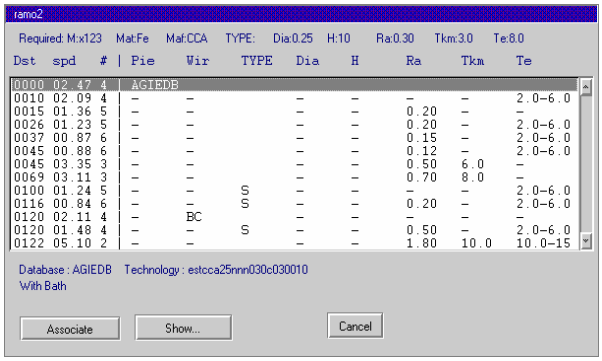
These sentences must be put at the end of the relative WORK, GROUP or PIECE definitions of the SCRIPT.

4.6.6.2 Forced automatic association (with/without control)

Automatic Technology association when executing a SCRIPT on AGIEVISION has been a common request from many customers. This has been implemented since AGIEVISION Version 03.00 (02.05). The sentences inside the SCRIPT to perform this associations are:

- ok=JE_GenerateAttrib(c_tecauto,c_tecauto_t)
- ok=JE_GenerateAttrib(c_tecassign,c_tecass_fi)
- ok=JE_GenerateAttrib(c_tecalert,c_tecalert_sea)

These are the most often used. The result of above sentences during SCRIPT-Execution is that no user intervention is needed to assign a quality target to the machinings of the workpiece. This means that no Technology-Chooser page (see picture below) will show up to select the technology for the defined quality target, because the technology is automatically assigned.



Automatic technology association can be used for AGIEDB or also for USERDB.

The second sentence with **c_tecass_fi** assigns automatically the first occurrence of the closest found technology for the desired quality. It's now depending from the weighting defined in the technology configuration menu on AV, which of the technology would appear first in the list of the thirteen choices (Technology-Chooser). It can therefore happen, that at the first position a technology is found with a different wire diameter as the one defined inside the SCRIPT. This will change at least the offset and therefore the measurements of the workpiece will be **completely wrong!!**. So this method can be **very dangerous!** There are better ways to achieve a correct technology association, but at cost of some loss of automatism. Instead of setting the second sentence with the parameter **c_tecass_fi**, you could also set it with **c_tecass_auto**. The result now would be an automatic technology association to the desired quality, but only if the relative technology is completely found at all his desired quality settings.

Otherwise the technology-Chooser page is showed and the user must choose one of the proposed technologies. The three sentences would in this case be:

- ok=JE_GenerateAttrib(c_tecauto,c_tecauto_t)
- ok=JE_GenerateAttrib(c_tecassign,**c_tecass_auto**)
- ok=JE_GenerateAttrib(c_tecalert,c_tecalert_sea)

In the case where splitting of the machinings in his single working steps has to be achieved, the second sentence must again be changed to **c_tecass_nauto**:

- ok=JE_GenerateAttrib(c_tecauto,c_tecauto_t)
- ok=JE_GenerateAttrib(c_tecassign,**c_tecass_nauto**)
- ok=JE_GenerateAttrib(c_tecalert,c_tecalert_sea)

5 Quality tables

The complete list of available wires is following:
(**CLA**=AGIECUT CLASSIC, **CHA**=AGIECUT CHALLENGE, **EVO**=AGIECUT EVOLUTION, EXC=AGIECUT EXCELLENCE, **EVO 2SFF** = AGIECUT EVOLUTION 2 SFF, **EXC2F**=AGIECUT EXCELLENCE 2 F)

Wire Type	New	CLA CHA	EVO EXC	EVO 2SFF EXC2F
Cobra Cut A 0.25		Yes	Yes	Yes
Berco Cut 0.25		Yes	Yes	Yes
Berco Cut 0.30	**New**	Yes	Yes	Yes
Berco Cut 0.15	**New**	Yes	Yes	Yes
Cobra Cut D 0.25		Yes	Yes	Yes
Cobra Cut W 0.25		Yes	Yes	Yes
Cobra Cut S 0.33		Yes	Yes	Yes
Cobra Cut S 0.30		Yes	Yes	Yes
Cobra Cut A 0.30		Yes	Yes	Yes
Cobra Cut A 0.20		Yes	Yes	Yes
Cobra Cut A 0.15		Opt	Yes	Yes
Cobra Cut A 0.10		Opt	Yes	Yes
Tungsteno 0.03				Yes
Tungsteno 0.05				Yes
SP Wire 0.07				Yes

Table for Ra-Values

Roughness in µm	CLA	CHA	EVO	EXC
0.01 Ra SF			Opt	Yes
0.04 Ra SF			Opt	Yes
0.10 Ra SF			Opt	Yes
0.12 Ra SF			Opt	Yes
0.15 Ra SF			Opt	Yes
0.18 Ra SF			Opt	Yes
0.20 Ra			Yes	Yes
0.25 Ra			Yes	Yes
0.30 Ra		Yes	Yes	Yes
0.35 Ra		Yes	Yes	Yes
0.40 Ra		Yes	Yes	Yes
0.45 Ra	Yes	Yes	Yes	Yes
0.50 Ra	Yes	Yes	Yes	Yes
0.60 Ra	Yes	Yes	Yes	Yes
0.70 Ra	Yes	Yes	Yes	Yes

Roughness in µm	CLA	CHA	EVO	EXC
0.80 Ra	Yes	Yes	Yes	Yes
0.90 Ra	Yes	Yes	Yes	Yes
1.00 Ra	Yes	Yes	Yes	Yes
1.10 Ra	Yes	Yes	Yes	Yes
1.20 Ra	Yes	Yes	Yes	Yes
1.30 Ra	Yes	Yes	Yes	Yes
1.50 Ra	Yes	Yes	Yes	Yes
1.80 Ra	Yes	Yes	Yes	Yes
2.00 Ra	Yes	Yes	Yes	Yes
2.30 Ra	Yes	Yes	Yes	Yes
2.50 Ra	Yes	Yes	Yes	Yes
3.00 Ra	Yes	Yes	Yes	Yes
5.00 Ra	Yes	Yes	Yes	Yes

Table for Tkm Values

Tkm in µm	CLA	CHA	EVO	EXC
1.0 SF				Yes
1.5 SF				Yes
2.0 SF				Yes
2.5 SF				Yes
3.0			Yes	Yes
4.0		Yes	Yes	Yes
5.0		Yes	Yes	Yes
6.0	Yes	Yes	Yes	Yes
7.0	Yes	Yes	Yes	Yes
8.0	Yes	Yes	Yes	Yes
10.0	Yes	Yes	Yes	Yes
12.0	Yes	Yes	Yes	Yes
15.0	Yes	Yes	Yes	Yes
20.0	Yes	Yes	Yes	Yes
25.0	Yes	Yes	Yes	Yes
30.0	Yes	Yes	Yes	Yes
35.0	Yes	Yes	Yes	Yes
40.0	Yes	Yes	Yes	Yes
45.0	Yes	Yes	Yes	Yes
50.0	Yes	Yes	Yes	Yes

Table for TE-Values

TE in um	1.5	4.0	8.0	12.5	17.5	25.0	40.0	65.0	290.0

Table for Materials

Code	Material
0001	Cold die Steel
0011	Electrolytic Cu
0021	Graphite < 10um
0031	Tungsten Carbide
0041	Aluminium
0051	Brass
0061	Sialon
0071	PKD

6 Tables for technology parameters

Parameter	Description	Min. value	Max value	Min. visual on AV	Step	Value in SBL
I	max. extent of impulse	0	22	0	1	Eff.value
P	frequency and form of impulse	0	34	1	1	Eff.value -1
td	Sollwert of discharge delay	0	63	10	table	use pos
Vs	constant speed	0	63	0.1	table	use pos
ISH	diff. of erosion impulse and short	0	7	-7	table	use pos
Ton	Impulse width for trim cut	0	15	0	1	Eff.value
Reg	regulation type	0	23	0	1	Eff.value
Reg		100	123	F0	table	use pos
UHP	void tension of H-bloc	0	7	0	1	Eff.value
PPV	positive polarity voltage	0	15	0	1	Eff.value
Aw	Wire speed	30	300	30	table	use vis
Fw	Wire tension	4	120	1	table	use trx
ACO	Adaptive control	0	63	0	table	use pos
ACOX	Extended Adaptive control	0	15	0	table	use pos
B	Bath yes/no	0	2	0	table	use pos
Q	flushing type (Q0,Q1,...)	0	6	0	table	use pos
p	Flushing pressure	2	180	0.2	table	use trx
K	Water conductivity	1	200	1	table	use vis

Parameter	Description	Min. value	Max value	Min. visual on AV	Step	Value in SBL
Str	Corner strategy	0	255	0	1	Eff.value
Mode	Parameter Set nr.	0	9999	0	1	Eff.value
Mode		10000	10009	M0	table	use pos
Mode		20000	29999	U0	table	use pos
SPL	Short Pulse limit	0	31	0	1	Eff.value

Table for td and VS

pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
td	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	51
VS	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4

pos	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
td	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
VS	3.6	3.8	4	4.25	4.5	4.75	5	5.25	5.5	5.75	6	6.33	6.66	7	7.33	7.66	8	8.5	9	9.5

pos	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
td	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93
VS	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Table for ISH

pos	0	1	2	3	4	5	6	7
ISH	0	-1	-2	-3	-4	-5	-6	-7

Table for Fw

pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
vis	1	1.25	1.5	1.75	2	2.25	2.5	3	3.5	4	4.5	5	5.5	6	6.6	7	7.5	8	8.5	9
trx	4	5	6	7	8	9	10	12	14	16	18	20	22	24	26	28	30	32	34	36

pos	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
vis	9.5	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
trx	38	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108	112

pos	40	41
vis	29	30
trx	116	120

Table for Aw

pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
vis	30	45	60	75	90	105	120	135	150	165	180	195	210	240	270	300

Table for p

pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
vis	0.2	0.3	0.5	1	1.5	2	3	4	5	6	8	10	12	14	16	18
trx	2	3	5	10	15	20	30	40	50	60	80	100	120	140	160	180

Table for K

pos	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
vis	1	2	3	5	7	10	15	20	30	40	50	75	100	125	150	200

Table for Q

pos	Q	flushing top	flushing bottom
0	Q0	No flushing	
1	Q11	direct	tap
2	Q12	tap	direct
3	Q13	direct	direct
4	Q14	direct	aspiration
5	Q15	startron	
6	Q16	tap	tap

Table for B

pos	BATH	Lower tank to thread	Circulation
0	NO		
1	YES	YES	YES
2	YES	NO	YES

Table for Reg from F0 to F23

pos	100	101	102	…	123
vis	F0	F1	F2	…	F23

Table for ACO

Bit	Pos	Vis	Comment
0	1	P	0=DLS OFF; 1=DLS ON
1	2	A	0=Normal flush;1=enhanced flush
2	4	I	0=Normal polarity; 1=inverted polarity
3	8	F	0=Normal trimcut; 1=FTC
4	16	H	0=normal trimcut; 1=precision cut
5	32	W	0=normal; 1=enable Schleppfehler calculation

Table for ACOX

Bit	Pos	Vis	Description
0	1	G	1=Activate enhanced generator modules
1	2	S	1=Activate enhanced servo modules
2	4	U	1=Activate VARIOCUT
3	8	C	1=Activate Dynamic Corner Control

ACO and ACOX can have No-ne,one,several or all values set to 1. The pos to enter into the value is the SUM of the pos-Column. Ex.: To set ACO = A and F the position-value to set is 10 (2+8). This would set enhanced flush and FTC.

Table for Mode M0..M9

pos	10000	10001	10002	…	10009
vis	M0	M1	M2	…	M9

Table for Mode U0..U9999

pos	20000	20001	20002	…	29999
vis	U0	U1	U2	…	U9999

6.1 Example

We give here an exhaustive example using all of above parameters. The values are casual and wouldn't give a good result on AGIEVISION.

```
…..
   ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASDELETE,NULL)
   ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASAGIE,NULL)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"I,3,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"P,5,;td,9,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"Vs,14,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"ISH,2,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"Ton,5,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"Reg,109,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"UHP,3,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"PPV,7,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"Aw,60,;Fw,64,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"ACO,24,;ACOX,6,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"B,1,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"Q,3,;p,140,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"K,75,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"Str,19,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"Mode,10002,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"SPL,13,;",je_dim)
   ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,"lav1","3",ID_TEC,"Ofs,43,;",je_dim)
…….
```

These settings will generate following visualized values on AGIEVISION2:

Mode	I	P	td	Vs	ISH	Ton	Reg	Str	UHP	PPV	SPL	ACO	ACOX	Fw	Aw	Ofs
M2	3	6	28	2	-2	5	F9	19	3	7	13	F+H	G+S	16	60	43

and for the Bath:

p	B	K	Q
14	1	75	13

If you enter these values for the 2nd trim cut as in the example, you won't get any values set for td, ISH, UHP and SPL, as they can't be used with certain defined values of other parameters.

Geometry [V/ISO-Code file *.ISO]

7.1 Properties of the AGIEVISION numerical control

The AGIECUT AGIEVISION numerical control can handle geometries composed of straight lines and circles with a resolution of 0.0005 mm.

One important property of the AGIECUT AGIEVISION numerical control is the fact that it can perform a simultaneous 4 - axis interpolation (X, Y, U and V). This is done by means of “Double sentences”. A double sentence is the description of a simultaneous increment in both a lower and an upper XY contour.

One half of the sentence describes an increment (straight line or circle) in a given XY plane (say at Z0), the other half in another plane (Z1). The increment types (straight line or circle) can be mixed. The number of segments on the bottom must be the same as the number of segments on the top. Null length segments are allowed as long as at least the G01, G02 or G03 is given. Don’t generate codes with only linear segment interpolation, as used in the previous Postprocessors, because the offset is now entered directly on the AGIEVISION according to the quality target used.

Another property of the AGIECUT AGIEVISION is that the contour may be expressed with rough edges. So it’s not necessary to add rounding radii between “broken” straight lines, as long as the segments are long enough that AGIEVISION can enter the needed rounding radii herself, without letting more than one neighbour segments disappear.

7.2 Description of the information

A V/ISO-Code file contains only the geometrical information of one single contour. There is no technological information. The geometric information is limited to the contour path: there is no information about entry or exit paths. The advantage of this is that a die and a punch can use the same V/ISO-Code!

7.3 Functions of the AGIEVISION numerical control

7.3.1 Summary of the functions

Function	Description	Modal
Nddddd	Sentence number	
X±dddddd	Increment in X with sign	
Y±dddddd	Increment in Y with sign	
Z±dddddd	Increment in Z with sign	
I±dddddd	Relative distance of circle centre in X with sign	
J±dddddd	Relative distance of circle centre in Y with sign	
R±dddddd	Radius of circle	
AU1**±dddddd (New V0304)**	**Increment in Auxiliary Axis 1 with sign**	
G00	Contour starting point	
G01	Linear interpolation	
G02	Circular interpolation CLW	
G03	Circular interpolation CCLW	
G70	Inch programming unit	Yes

G71	Metric programming unit	Yes
G90	Absolute increment	Yes
G91	Relative increment	Yes
M02	Physical program end	

;	End of sentence
( )	Comment (nested)
#	Comment (till end of line)

7.3.2 Use of the functions

N *ddddd*

The sentence number is mandatory. The sequence isn't relevant, but each sentence must have a unique sentence number. The number ***ddddd*** can be variable in length (any number of digits, up to 40, but more than 15 digits (64 bit) are not possible with the actual calculators).

For example : N1, N02, N003, N0004, N00005, ...

X± *dddddd*

This information indicates the distance in X to move. The distance is relative to the position reached with the preceding sentence, if the modal code ***G91*** is active. If ***G90*** is active, the distance is absolute, that means that it is relative to the reference system of the contour (work). The value can be expressed in tenth of a micron (without decimal point) or in millimetres (with decimal point), if the modal code ***G71*** is active. If ***G70*** is active the value can be expressed in 1/100.000 inch (without decimal point) or in inches (with decimal point).

If no movement must be made by the X - axis, either omit this function or insert X±0 (only incremental mode).

Y± *dddddd*

The same as for "*X±dddddd*", but for the ***Y*** - movement.

Z± *dddddd*

This information is used only in a ***G00*** sentence. It sets the Z position of the XY plane for the whole contour.

In a double ***G00*** sentence the Z value can be specified twice (for the upper and the lower contour). The first Z value is always the lower contour!

I± *dddddd*

The distance on the X -axis from the centre of the circle (C) relative to its startpoint (X_a). ***I*** is always relative, no matter which *G9x* is active.

Otherwise the same rules as for *"X±dddddd"* apply.

J± *dddddd*

The same as for "I±dddddd", but for the ***Y*** - direction.

R± *dddddd*

This information indicates the Radius of Circle. R == 0.0 is not possible. R > 0.0 indicate Arc of Circle <= 180.0, R < 0.0 indicate Arc of Circle > 180.

AU1±dddddd

This information indicates the distance/angle in AU1 to move. The distance/angle is relative to the position reached with the preceding sentence if the modal code G91 is active. If G90 is active, the distance is absolute, that is, relative to the reference system of the contour. The value can be expressed in tenths of micron (no decimal point) or in millimetres (with decimal point) if the modal code G71 is active. If G70 is active, the value can be expressed in 1/100,000 inch (no decimal point) or in inches (with decimal point), if the axis is configured as a linear axis.

If the axis is configured as a rotation axis, the G71/G70 code has no effect.

This word can be omitted, if no movement must be produced in the A1-axis (nothing instead of AU1 ±0).

These values could be added at the end of each sentence in the lower contour.

G00

Each AGIECUT AGIEVISION contour is placed in a Cartesian reference system. G00 sets the contour start point relative to the origin of this reference system. A G00 sentence is mandatory as first sentence in a V/ISO- Code file. G00 also sets the height at which the contour is defined through a Z address. Both XY planes (upper & lower contour) can be set at a given Z value with a double G00 sentence (normally the Z value for the lower contour is omitted laying the contour at Z=0)

G01

This function tells the AGIECUT EVOLUTION / CLASSIC that the movement expressed in this sentence is linear. G01 is *not modal*. If it's used in the next sentence, it has to be repeated

G02

This function tells the AGIECUT EVOLUTION / CLASSIC that the information contained in this sentence is relative to a circle in clockwise direction (CLW). G02 is *not modal.*

If it's used in the next sentence, it has to be repeated. As programming practice we recommend to split the circle at 180° or 270° whenever a full circle must be produced.

G03

This function tells the AGIECUT EVOLUTION / CLASSIC that the information contained in this sentence is relative to a circle in counter clockwise direction (CCLW).

The same rules as for *"G02*" apply.

G70

Stand alone code. After a G70 all X, Y, Z, I and J values are considered as inch values. G70 is *modal*.

G71

Stand alone code. After a G71 all X, Y, Z, I and J values are considered as mm values. This is the default case, when no *G7x* is specified. G71 is *modal*.

G90

Stand alone code. After a G90 all X, Y and Z values are considered as absolute values. I and J values remain incremental values.

This is the default case, when no *G9x* is specified. G90 is *modal*.

G91

Stand alone code. After a G91 all X, Y and Z values are considered as incremental values. I and J values are always incremental values.
G91 is *modal*.

M02

Stand alone code. It marks the end of the program.

;

Mandatory for the end of a sentence.

( )

A comment embedded in a pair of parenthesis can span multiple lines.

This kind of comment may be nested.

#

All characters, which follows a "#" until the end of the line (LF), are treated as a comment.

7.4 Syntax rules

7.4.1 General syntax rules

All AGIECUT AGIEVISION functions must be entered by the following rules:

- All alphabetical characters must be entered in upper case.
  If G71 is active and if the decimal point appears in a numerical field, the value of the field is in mm (millimetres). If no decimal point is used then the value is in 0.0001 mm (1 tenth of a micron). If G70 is active and if the decimal point appears in a numerical field, the value of the field is in inches. If no decimal point is used, the value is in 0.00001 inch (1/100.000 inch).
- The numerical fields may have variable length with a maximum of 40 digits.
- Carriage Return (CR) and the Line Feed (LF) are not necessary. They can be used for readability purposes (to divide one sentence from another or to break one double sentence in upper and lower contour).

- There is no need to separate the tokens in a sentence with a blank space (tabs, spaces). They can be used for readability purposes.

7.4.2 Syntax rules for movement sentences

In a movement sentence the token sequence is relevant:

- G00 Xddd Yddd Zddd
- G01 Xddd Yddd
- G02 Xddd Yddd Iddd Jddd
- G03 Xddd Yddd Iddd Jddd

7.4.3 Syntax rules for double sentences

A double sentence is divided in two parts. The first part begins after the sentence number and specifies a movement in the XY plane of the lower contour. The type of movement is specified by a G0x code followed by the appropriate number of co-ordinate values. The second part specifies a movement in the XY plane of the upper contour. A semicolon (';') closes the sentence.

Example:

```
N006    G01  X+0002.309401  Y-0004.000000
        G03  X+0000.400000  Y-0000.692820  I+0000.800000 ;
```

8 Format of the AGIECUT AGIEVISION data catalogue

8.1 Introduction data catalogue

A data catalogue is a data format that transfers the measuring data from a measuring machine to the erosion machine.

8.2 The directory structure

- There will not be any fixed directory structure for the storage of the AGIECUT EVOLUTION / CLASSIC data catalogue.
- The filename of the data catalogue may be chosen freely.
- The filename extension is ".MES" .

8.3 Format of the data catalogue

The data catalogue includes the following Information:

Designation	**Meaning**	**For object**
Object Link	A complete string of the objects, starting with the hierarchical highest one (identical names as in the PIECEDITOR)	--
Object Type	Correction value: **W**: workpiece **I**: start point **A**: work **R**: group of work **G**: group **P**: pallet **V**: table Reference value: **N**: Auxiliary Reference	--
Related Object	Object, that is associated with the measured object	N
Reserved		--
Reference X	X-Reference (axis value out of the drawing)	N
Y	Y-Reference (axis value out of the drawing)	N
Z	Z-Reference (axis value out of the drawing)	N
A	A-Reference (rotation value out of the drawing)	N
B	B-Reference (rotation value out of the drawing)	N
C	C-Reference (rotation value out of the drawing)	N
Correction X	X-correction (shift value referred to the nominal position)	W/I/A/G/P
Y	Y-correction (shift value referred to the nominal position)	W/I/A/G/P
Z	Z-correction (distance between the upper object plane and the zero plane of the machine)	W/A/G/P
A	A-correction (object inclination around the X-axis)	W/A/G/P
B	B-correction (object inclination around the new Y-axis)	W/A/G/P
C	C-correction (object inclination around the new Z-axis)	W/A/G/P
Tilt A	Object was tilted around the measuring machine A-axis during the settings: No / Yes (180°)	W
Tilt B	Object was tilted around the measuring machine B-axis during the settings: No / Yes (180°)	W
Rotated C	Object was rotated around the measuring machine C-axis during the settings: 0° / 90° / 180° / 270°	W
H	Object height	W
HS	Safety plane (distance between the upper guide head and the upper object plane)	W
Designation	**Meaning**	**For object**

	Clearance	Undersize for electrodes	A/R
	HP	Return plane (height of the collision free traverse plane)	W
PW1	X	X-co-ordinate of point 1 of the travel limit related to the object	W/P/V
	Y	Y-co-ordinate of point 1 of the travel limit related to the object	W/P/V
PW2	X	X-co-ordinate of point 2 of the travel limit related to the object	W/P/V
	Y	Y-co-ordinate of point 2 of the travel limit related to the object	W/P/V

Reference and correction values may only be introduced into the corresponding data fields.

Reference values are:
Auxiliary Reference (solely measurable reference value)

Correction values are:
workpiece, startpoint, work, group of work, group, pallet, table

- Since object inclination is corrected in the space, one has to calculate the axes values of X, Y and Z related to the rotation axes A, B and C. The result of this calculation then must be entered into the data catalogue of the AGIECUT AGIEVISION.
- This operation is not valid for reference values.
- The file of a data catalogue is an ASCII-file. That means that the content of a data catalogue can be shown and modified with a text editor or a spreadsheet program.
- A data sentence must not necessarily be complete. The missing information has to be added through the operator <-> machine dialog before the work job start. Otherwise the work cannot start.
- The data catalogue file contains single lines, each of which representing a data sentence. The single lines end with the string Carriage Return - Line Feed (CR/LF, ASCII: 0DH/0AH).
- The number of data sentences per data catalogue file is not limited.
- The single entries in a data sentence are subdivided by commas (“,”, ASCII: 2CH) (CSV - format).
- If in a data sentence single entries are omitted and followed by other entries, this will be shown by a series of commas without value between them.
- If in a data sentence single entries are omitted which are not followed by other entries, the data sentence can end with the string Carriage Return - Line Feed (CR/LF, ASCII: 0DH/0AH).
- The real figure values must not include unused digits (e.g. 35.67). The decimal is indicated by a point (“.”, ASCII 2EH). Negative values are preceded by the minus sign (“-”, ASCII: 2DH), positive ones by the plus sign (“+”, ASCII: 2BH). The use of the plus sign for positive figures is optional, i. e. it can be omitted.
- Angle information is always in degrees (full circle = 360°).
- Values out of the given range are considered as not being available.

- The input “Object Link” is a list in which the single entries are subdivided by semicolons (“;”, ASCII: 3BH). Two successive semicolons are not allowed.

The following signs are allowed for the input of the object names:

Capital letters	:	“A”…“Z”	ASCII: 41H - 5AH
Small letters	:	“a” …“z”	ASCII: 61H - 7AH
Vowel-mutation capital	:	“Ä”, “Ö”, “Ü”	ASCII: 8EH, 99H, 9AH
Vowel-mutation small	:	“ä”, “ö”, “ü”	ASCII: 84H, 94H, 81H
Accents	:	“é”, “è”, “ê”	ASCII: 82H, 8AH, 88H
		“à”, “ç”, “ñ”	ASCII: 85H, 87H, A4H
Figures	:	“0” …“9”	ASCII: 30H - 39H
Parenthesis	:	“{”, “}”	ASCII: 7BH, 7DH
Space	:	“ “	ASCII: 20H
Underline	:	“_”	ASCII: 5FH

Other signs are not allowed. The designation of a single object has a maximal length of 20 signs. The data field “Object Link” can include a string with maximal 4 objects (max. 83 signs, incl. Semicolons).

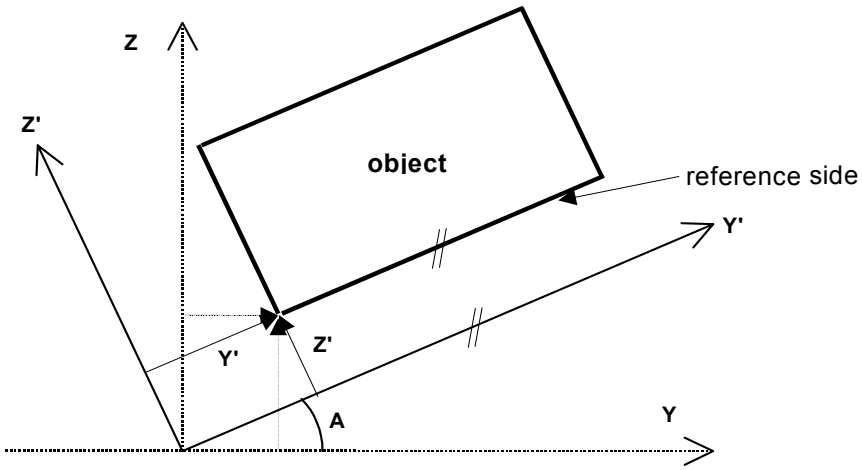
- The input “Related object” is a string, which marks an object. The following signs are allowed for the input of the object name:

Capital letters	:	“A”…“Z”	ASCII: 41H - 5AH
Small letters	:	“a” …“z”	ASCII: 61H - 7AH
Vowel-mutation capital	:	“Ä”, “Ö”, “Ü”	ASCII: 8EH, 99H, 9AH
Vowel-mutation small	:	“ä”, “ö”, “ü”	ASCII: 84H, 94H, 81H
Accents	:	“é”, “è”, “ê”	ASCII: 82H, 8AH, 88H
		“à”, “ç”, “ñ”	ASCII: 85H, 87H, A4H
Figures	:	“0” …“9”	ASCII: 30H - 39H
Parenthesis	:	“{”, “}”	ASCII: 7BH, 7DH
Space	:	“ “	ASCII: 20H
Underline	:	“_”	ASCII: 5FH

Other signs are not allowed. The designation of the object has a maximal length of 20 signs.

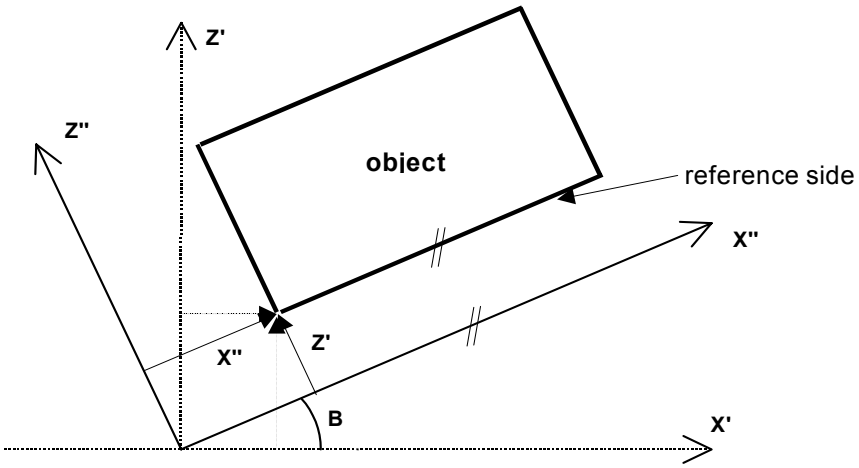
8.4 3D-Rotation and transformation of co-ordinates

The correction values Y and Z related to the A rotation axis:



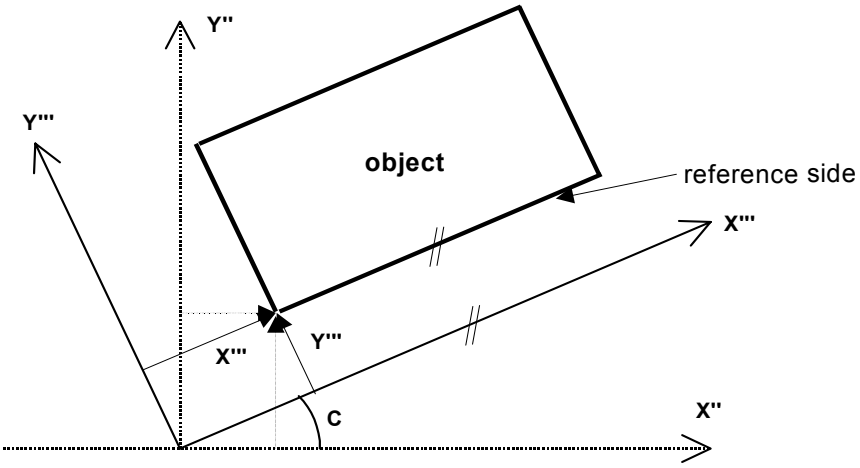
Reference coordinate system
Correction coordinate system with the Y', Z' and A values

The correction values X'' and Z'' related to the B rotation axis:



Reference coordinate system after rotation of A angle
Correction coordinate system with the X'', Z'' and B values

The correction values X and Y related to the C rotation axis:



Reference coordinate system after rotation of angles A,B
Correction coordinate system with the X''', Y''' and C values

After having measured the XYZABC values on the CMM, it's necessary to transform the XYZ co-ordinates from the original co-ordinate system (of the chuck) to the co-ordinate system of the Workpiece.

Calculate the new Xcorr-, Ycorr- and Zcorr-Values, where:
Xoffs: is the offset value from the chuck Reference (X=0) to the Piece Reference (X' = 0)
Yoffs: is the offset value from the Chuck Reference (Y=0) to the Piece Reference (Y' = 0)
Zoffs: is the offset value from the Chuck Reference (Z=0) to the Piece Reference (Z' = 0)

and A,B,C angles are the measured angles on the CMM. See 6.5. how A,B is found.

8.5 Description of A,B and C

A Workpiece has to be eroded. It has a Reference Point from where the NC-Programs will be defined. The Workpiece has to be placed on a holder, which also has a Reference Point. The same holder is used to measure the Piece reference and to perform the erosion.

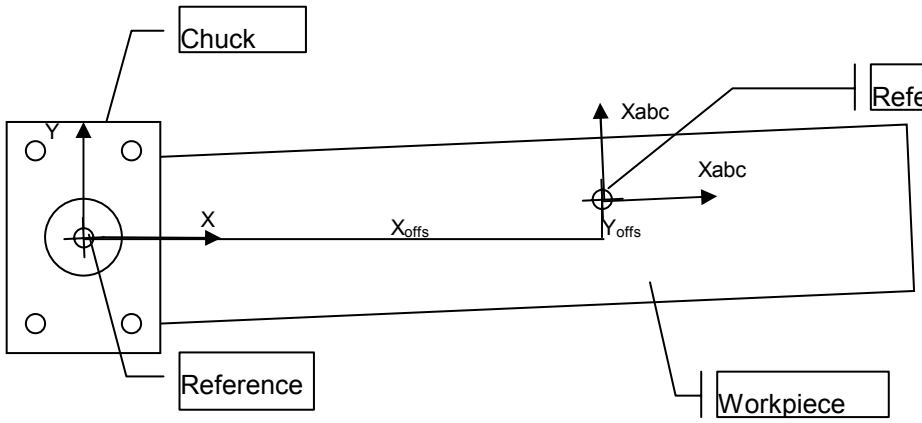


Fig. #1

On the measuring machine (CMM) the distance of the Piece Reference from the Chuck Reference is first measured, so that we get X_{offs}, Y_{offs} and Z_{offs} value. Then the angles A and B are measured taking three points on the upper XY-Plane. At the end the C angle is measured by taking two points on the XZ surface.

The new co-ordinate system of the Piece has now to be found, because it's the Piece we would like to erode on our machine and in a perfectly aligned co-ordinate system. The rotation angles are A, B and C, and the new co-ordinates of the Reference Point are calculated by the mathematical formulas for rotation of an orthogonal co-ordinate system in a 3-dimensional space, giving X_{corr}, Y_{corr} and Z_{corr}.

Formula 1:

$$X_{corr} = X_{offs} * \cos(\beta) * \cos(\chi) + Y_{offs} * \left(\cos(\alpha) * \sin(\chi) + \sin(\alpha) * \sin(\beta) * \cos(\chi)\right) + \\ + Z_{offs} * \left(\sin(\alpha) * \sin(\chi) - \cos(\alpha) * \sin(\beta) * \cos(\chi)\right) \qquad 1.1$$

$$Y_{corr} = -X_{offs} * \cos(\beta) * \sin(\chi) + Y_{offs} * \left(\cos(\alpha) * \cos(\chi) - \sin(\alpha) * \sin(\beta) * \sin(\chi)\right) + \\ + Z_{offs} * \left(\sin(\alpha) * \cos(\chi) + \cos(\alpha) * \sin(\beta) * \sin(\chi)\right) \qquad 1.2$$

$$Z_{corr} = X_{offs} * \sin(\beta) - Y_{offs} * \sin(\alpha) * \cos(\beta) + Z_{offs} * \cos(\alpha) * \cos(\beta) \qquad 1.3$$

8.5.1 Method

First angle A and B are found by measuring three points on the upper XY-surface. Two vectors are place into these three points. The vector product of these two vectors yield the Z* vector which is per definition perpendicular to the measured plane. Any rotation in C will give exactly the same A and B angles, because the C-angle is measured turning around the Z* axis.

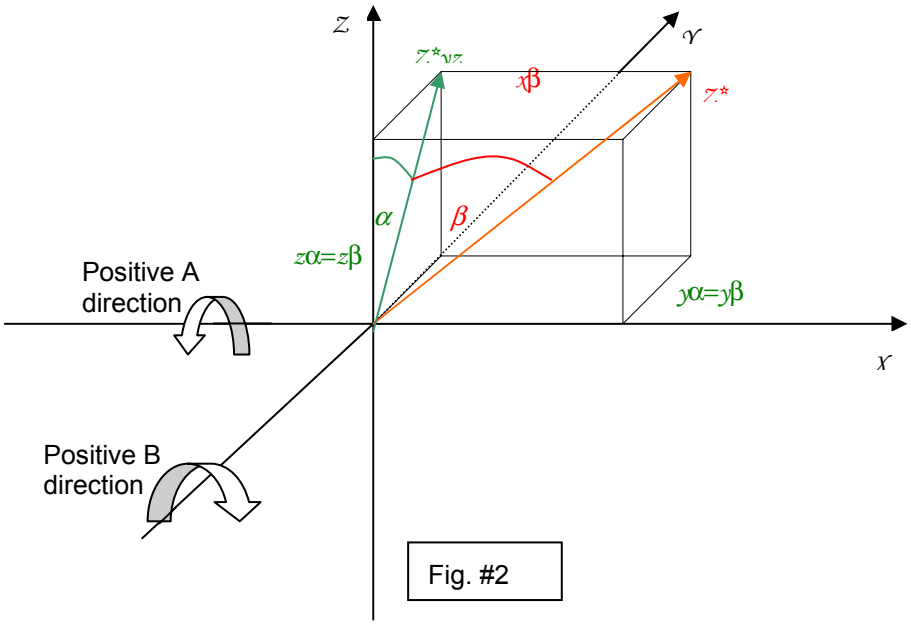


Fig. #2

Measuring at least 3 points on the upper plane of the piece (Fig.#3) you get a plane which has a normal vector marked as Z* calculated by vector product. This is the same vector drawn in Fig. #2.

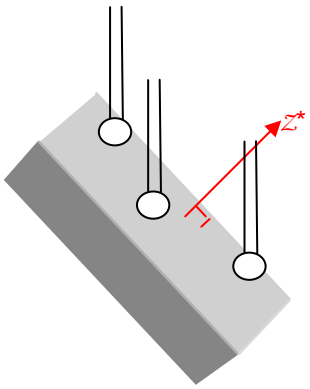


Fig. #3

8.5.2 How to calculate β

The angle β can be looked at, as the angle between the vectors $z^*$and z^*yz which is an orthogonal projection of Z* on the yz –plane. So it is the vector z^* without the **X** component. The calculation is:

$$\beta = \arctan\left(\frac{x_\beta}{\sqrt{y_\beta^{\,2} + z_\beta^{\,2}}}\right)$$

8.5.3 How to calculate α

The angle α is calculated being the angle between the vector *z*yz and the vector *z*α.

As the angle α referenced to *z* is rotated in clockwise direction we have that yα is positive for negative α (see fig #1) and vice-versa. This gives:

$$\alpha = \arctan\left(\frac{-y_\alpha}{z_\alpha}\right)$$

8.5.4 How to calculate χ

After having measured and found the angles A,B, we have a new co-ordinate system (X_{ab},Y_{ab}, Z_{ab}) rotated by these two angles.
Measuring two Points (P1,P2) on the $X_{ab}Z_{ab}$-plane gives us a line (Lp1p2). See fig. #4.

The angle χ is the angle in the new co-ordinate system (X_{ab},Y_{ab}, Z_{ab}) between the line relative to the a,b-rotated X-axis and the line (Lp1p2)

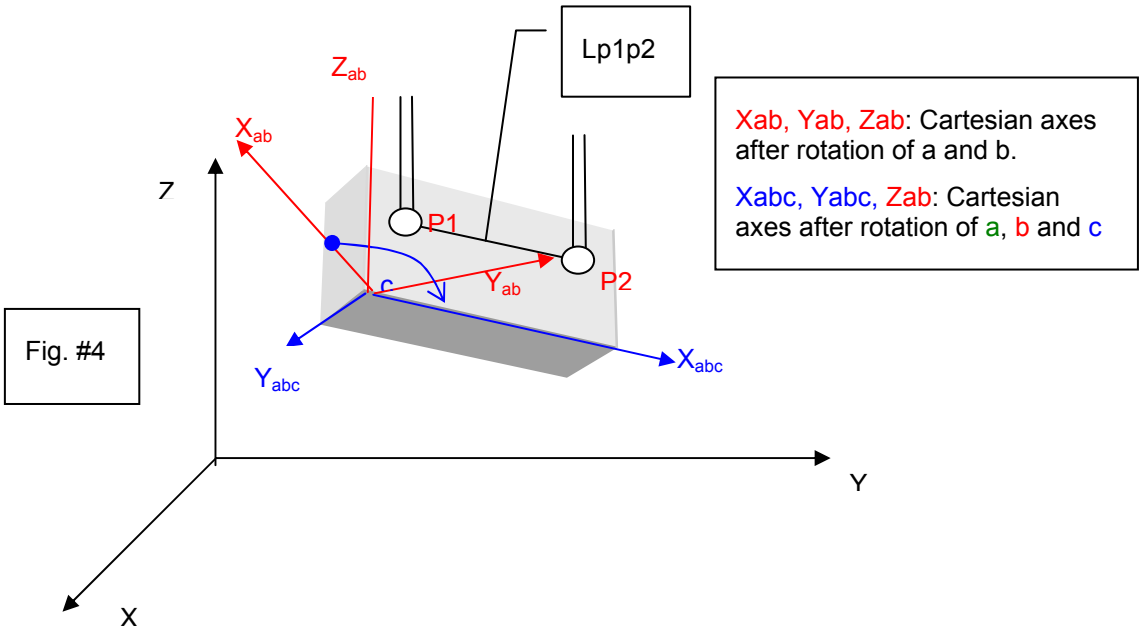


Fig. #4

First operation to perform is to find the co-ordinates of the Points P1 and P2 relative to the new co-ordinate system (X_{ab},Y_{ab}, Z_{ab}). We transform therefore the co-ordinates of P1 and P2 according to the formulas 1.1, 1.2 and 1.3, where the angle C is zero.

$$P1Xab = P1X_{offs} * \cos(\beta) + P1Y_{offs} * \sin(\alpha) * \sin(\beta) - P1Z_{offs} * \cos(\alpha) * \sin(\beta)$$

$$P1Yab = P1Y_{offs} * \cos(\alpha) + P1Z_{offs} * \sin(\beta)$$

And for P2 :

$$P2Xab = P2X_{offs} * \cos(\beta) + P2Y_{offs} * \sin(\alpha) * \sin(\beta) - P2Z_{offs} * \cos(\alpha) * \sin(\beta)$$

$$P2Yab = P2Y_{offs} * \cos(\alpha) + P2Z_{offs} * \sin(\beta)$$

The angle χ_{p1p2} of the line Lp1p2 will therefor be:

$$\chi_{P1P2} = \arctan\left(\frac{P2Y_{ab} - P1Y_{ab}}{P2X_{ab} - P1X_{ab}}\right) = C$$

Examples of data catalogue sentences

Data's belonging to the workpiece "AD2345_54":
AD2345_54,W,,,,,,,,,0.765,0.567,50.456,0.146,0.356,1.245,0,0,0,49.998,0.05,,30,24.567,30.567,70.445,50.346

Data's belonging to the startpoint "233_344", of the workpiece "AD2345_54":
AD2345_54;233_334,I,,,,,,,,,3.455,4.234

Data's belonging to a group "G7_AB670" in Workpiece Piece1:
Piece1;G7_AB670,G,,,,,,,,,12.857,4.678,,11.234

Data's belonging to the Auxiliary Reference "Z_5839" which belongs to the table "73489" :
73489,N,Z_5839,,23,45,79,0.34,0.456,0.456

The *.MES - file format of the AGIEVISION

The Filename extension must be MES. The Filename itself can be any, but maximum 8 characters in length. For practical reason its best to give the filename the same name as the Workpiecename.

Workpiece name: PIECE

Filename: PIECE.MES

An empty Measure file can be created in AGIEVISION to facilitate the filling of the measured data's together with the information of the piecenames.

Content of empty Messfile Piece,W,,,,,,,,,,,,,,,,,,,

The Longname is given in the *.MER file

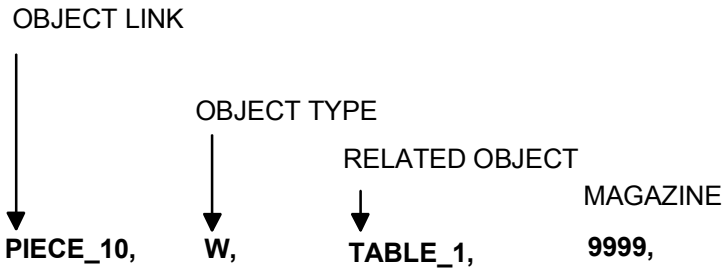
- MEASURE1.MES real name (Physical file name)
CIRCLE:1 present name (in AGIEVISION)

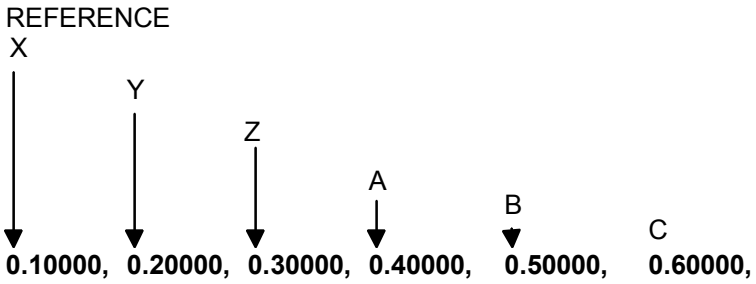
- Content of the MEASURE1.MER

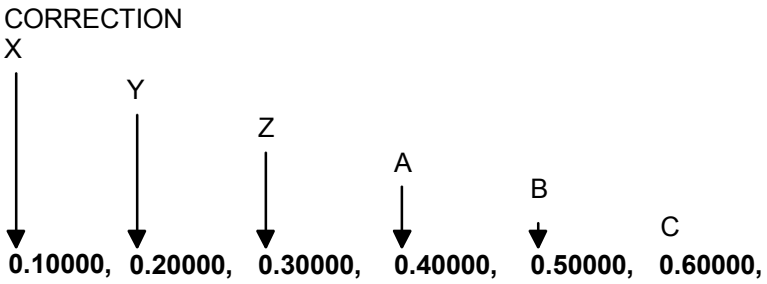
AGIE.VERSION 0,02.03.00;

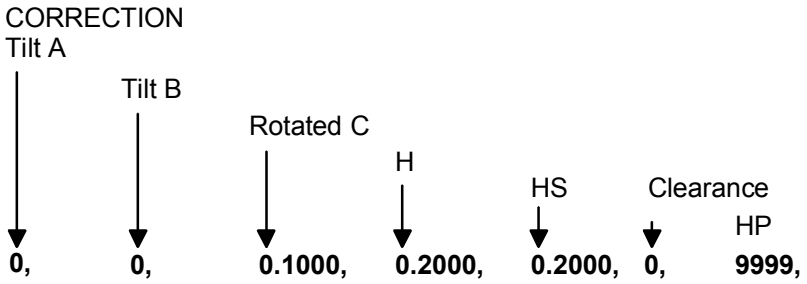
.LONGNAME **CIRCLE:1**;

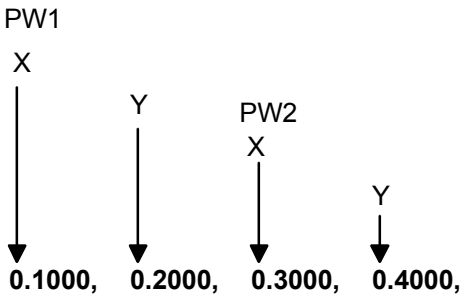
The values are sorted in a data sentence in the following order:











The sequence of the values in the data catalogue file cannot be modified.

The following value ranges are valid for the inputs in the data catalogue:

OBJECT LINK		→	**String [83]**
OBJECT TYPE		→	W : WORKPIECE I : START POINT A : WORK R : WORK OF GROUP G : GROUP P : PALLET V : TABLE N : AUXILIARY REFERENCE
RELATED OBJECT		→	String [20]
RESERVED			
REFERENCE	X	→	-999.99999 - 999.99999
	Y	→	-999.99999 - 999.99999
	Z	→	-999.99999 - 999.99999
	A	→	-999.99999 - 999.99999
	B	→	-999.99999 - 999.99999
	C	→	-999.99999 - 999.99999
CORRECTION	X	→	-999.99999 - 999.99999
	Y	→	-999.99999 - 999.99999
	Z	→	-999.99999 - 999.99999
	A	→	-360.00000 - 360.00000
	B	→	-360.00000 - 360.00000
	C	→	-360.00000 - 360.00000
	TILT A	→	0 : NO 1 : YES (180°)
	TILT B	→	0 : NO 1 : YES (180°)
ROTATED C		→	0 : NO 1 : 90° 2 : 180° 3 : 270°
	H	→	0 - 999.99999
	HS	→	0 - 999.99999
CLEARANCE		→	-999.99999 - 999.99999
	HP	→	0 - 999.99999
PW1	X	→	-999.99999 - 999.99999
	X	→	-999.99999 - 999.99999
PW2	X	→	-999.99999 - 999.99999
	Y	→	-999.99999 - 999.99999

9 Programming Examples

9.1 Minimal content of a scriptfile with startpoint information (compare with example 1/piece1.sbl)

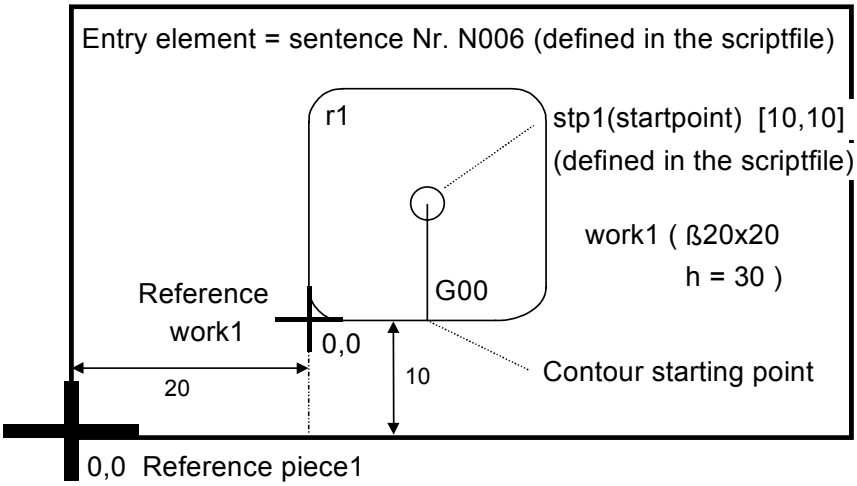
```
'comment 1 at the beginning of a scriptfile
'$Include "jescript.sbh"
sub main
ok = JE_Initiate
if (ok=0) then
'comment 2 in the middle of a scriptfile
'comment 3
'comment 4
ok=JE_Create(WORK,je_piece,je_grp,"work1")
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_GEOMETRY,"AGIE.USING_work1a.ISO",je_dim)
ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"work1")
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_STP,"stp1",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_STPMODE,c_work,je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","stp1",ID_POSX,"10",je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","stp1",ID_POSY,"10",je_dim)
ok=JE_ClosePiece(je_piece)
else
stop
end if
end sub

'comment 5 at the end of a scriptfile
```

The use of a comment line

You can write a comment everywhere in a scriptfile. The Number of comments isn't limited.

9.2 Example 1 (piece 1): Die, cylindrical

(ß 20x20, h=30 mm)



material = Cold die Steel Ra = 1.8 µm
wire = Cobra Cut D 0.25 Tkm = ±10 µm
reverse cut = true Te = 10 -15 µm

Fig. # 1 separation cut = 1 mm

V/ISO-Code (contour): example 1 / work1a.iso
(with absolute (a) values in X, Y and Z)

```
N00002 G00 X10.0 Y0.0 ;        # Contour starting point  /  relative to the work  reference
N00004 G90 ;                   # The values in X, Y and Z are absolute.
N00006 G01 X19.0 ;             # First contour element
N00008 G03 X20.0 Y1.0 J1.0 ;   # Second contour element
N00010 G01 Y19.0 ;
N00012 G03 X19.0 Y20.0 I-1.0;
N00014 G01 X1.0 ;
N00016 G03 X0.0 Y19.0 J-1.0
N00018 G01 Y1.0 ;
N00020 G03 X1.0 Y0.0 I1.0 ;
N00022 G01 X10.0 ;             # Last contour element
N00024 M02 ;                   # Program end.
```

Contour reference file: example 1 / piece1.sbr

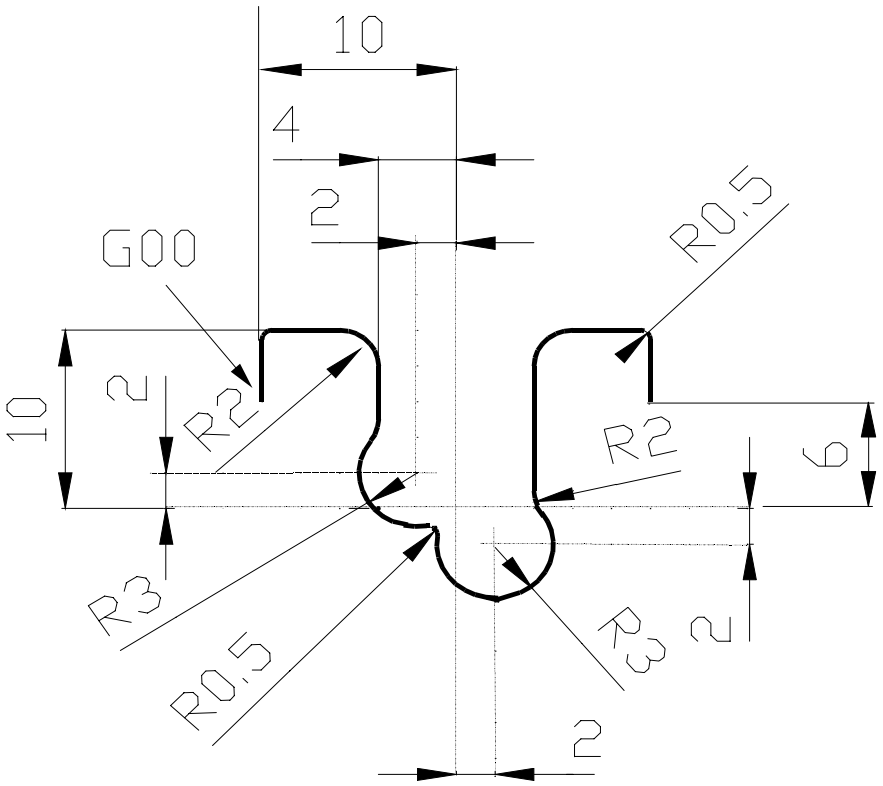
AGIE.USING_[filename] IMPORT [filename];

in this example: AGIE.USING_work1a.ISO IMPORT work1a.ISO;

Scriptfile: example1 / piece1.sbl

```
'$Include "jescript.sbh"
sub main
  ok = JE_Initiate
  if (ok=0) then
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"30",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"piece1",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,"0001",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut D 0.25",je_dim)
    ok=JE_Create(WORK,je_piece,je_grp,"work1")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_GEOMETRY,"AGIE.USING_work1a.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_PUNCH,c_die,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_CreateQuality(je_piece,"Q1","1.8,12.5,10.0",je_q1)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_QUALITY, je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_SEPCUT,"1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_REVCUT,"T",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_POSX,"20",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_POSY,"10",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_ENTRY,"6",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"work1")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_STP,"stp1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work1",NULL,ID_STPMODE,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","stp1",ID_POSX,"10",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work1","stp1",ID_POSY,"10",je_dim)
    ok=JE_GenerateAttrib(c_tecauto, c_tecauto_t)
    ok=JE_GenerateAttrib(c_tecassign, c_tecass_fi)
    ok=JE_GenerateAttrib(c_tecalert, c_tecalert_sea)
    ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASDELETE,NULL)
    ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASAGIE,NULL)
    ok=JE_ClosePiece(je_piece)
  else
    stop
  end if
end sub
```

9.3 Example 2 (piece 2): Open contour, cylindrical (h = 5 mm)



Rounding radius = 2 mm

material = Cold die Steel
wire = Cobra Cut D 0.25

Ra = 1.8 µm
Tkm = ±10 µm
Te = 10 -15 µm

Fig. # 2a

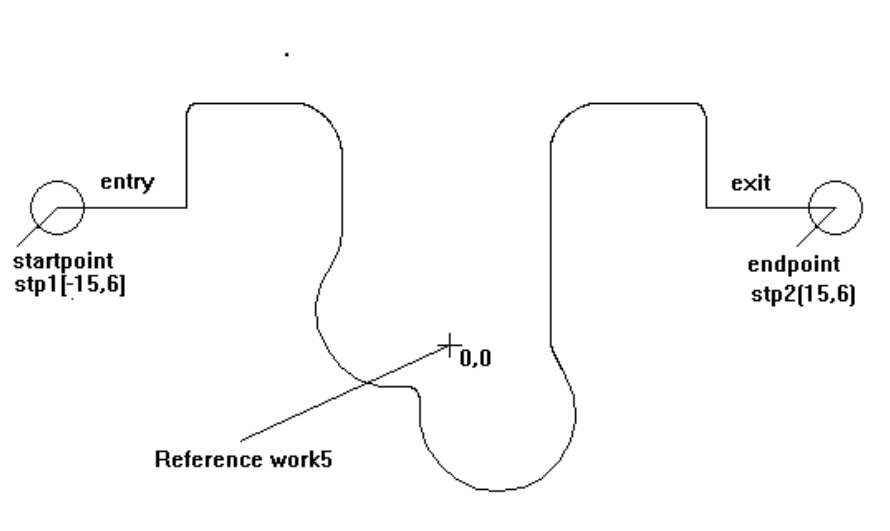
V/ISO-Code (contour): example 2 / work2.iso
(with absolute (a) values in X, Y and Z)

```
N00001 G00 X-10.0 Y6.0 ;
N00002 G01 Y9.5 ;
N00003 G02 X-9.5 Y10.0 I0.5 ;
N00004 G01 X-6.0 ;
N00005 G02 X-4.0 Y8.0 J-2.0 ;
N00006 G01 Y5.0 ;
N00007 G02 X-4.4 Y3.8 I-2.0 ;
N00008 G03 X-1.535204 Y-0.963775 I2.4 J-1.8 ;
N00009 G02 X-0.963775 Y-1.535204 I0.077466 J-0.493963 ;
N00010 G03 X4.4 Y-0.2 I2.963775 J-0.464796 ;
N00011 G02 X4.0 Y1.0 I1.6 J1.2 ;
N00012 G01 Y8.0 ;
N00013 G02 X6.0 Y10.0 I2.0 ;
N00014 G01 X9.5 ;
N00015 G02 X10.0 Y9.5 J-0.5 ;
N00016 G01 Y6.0 ;
N00017 M02 ;
```

Contour reference file: **example 2 / piece2.sbr**

AGIE.USING_[filename] IMPORT [filename];

in this example: AGIE.USING_work2.ISO IMPORT work2.ISO;



02397a_e.bmp

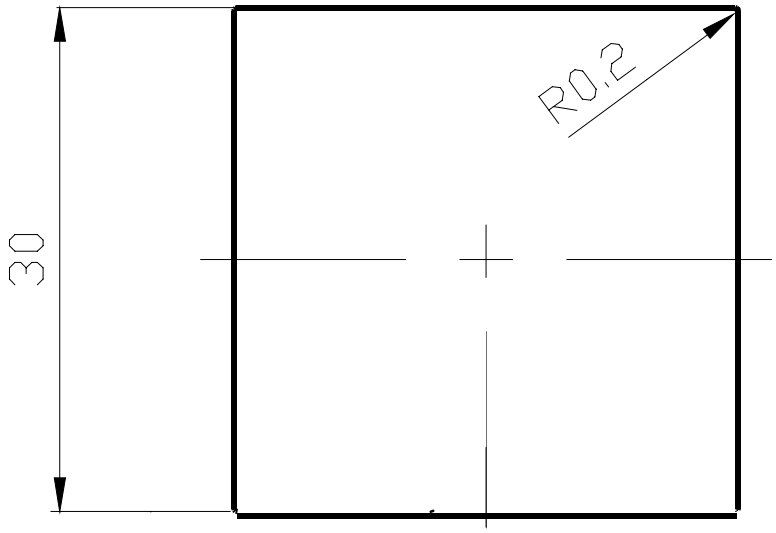
Fig. # 2b

Scriptfile: example 2 / piece2.sbl

```
'$Include "jescript.sbh"
sub main
  ok = JE_Initiate
  if (ok=0) then
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"5",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"piece2",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,”0001”,je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut D 0.25",je_dim)
    ok=JE_Create(WORK,je_piece,je_grp,"work5")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_GEOMETRY,"AGIE.USING_work2.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_EXITMODE,c_entper,je_dim)
    ok=JE_CreateQuality(je_piece,”Q5”,”1.8,12.5,10.0”,je_q1)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_QUALITY, je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_POSX,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_POSY,"0",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"work5")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_STPENTRY,"stp1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_STPOPEN,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work5","stp1",ID_POSX,"-15",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work5","stp1",ID_POSY,"6",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp2",je_piece,je_grp,"work5")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_STPEXIT,"stp2",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work5",NULL,ID_STPOPEX,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work5","stp2",ID_POSX,"15",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work5","stp2",ID_POSY,"6",je_dim)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work5",ASDELETE,NULL)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work5",ASAGIE,NULL)
    ok=JE_ClosePiece(je_piece)
  else
    stop
  end if
end sub
```

9.4 Example 3 (piece 3): conic with a cylindrical contour

(ß 30x30, h = 50 mm, 7.50)



Rounding radii = 4 x 0.2 mm

material = Cold die Steel
wire = Cobra Cut D 0.25
reverse cut = true
separation cut = 2 mm

Ra = 1.8 µm
Tkm = ±10 µm
Te = 10 -15 µm

Fig. # 3a

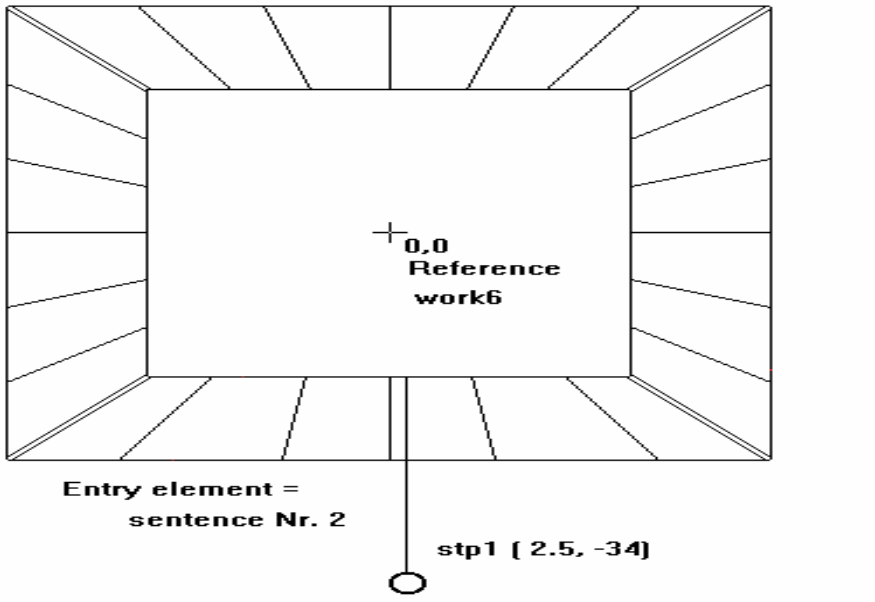
V/ISO-Code (contour): example 3 / work3.iso
(with absolute (a) values in X, Y and Z)

```
N00001 G00 X2.5 Y-15.0 ;
N00002 G01 X14.8 ;
N00003 G03 X15.0 Y-14.8 J0.2 ;
N00004 G01 Y14.8 ;
N00005 G03 X14.8 Y15.0 I-0.2 ;
N00006 G01 X-14.8 ;
N00007 G03 X-15.0 Y14.8 J-0.2 ;
N00008 G01 Y-14.8 ;
N00009 G03 X-14.8 Y-15.0 I0.2 ;
N00010 G01 X2.5 ;
N00011 M02 ;
```

Contour reference file: **example 3 / piece3.sbr**

AGIE.USING_[filename] IMPORT [filename];

in this example: AGIE.USING_work3.ISO IMPORT work3.ISO;



02396a_e.bmp

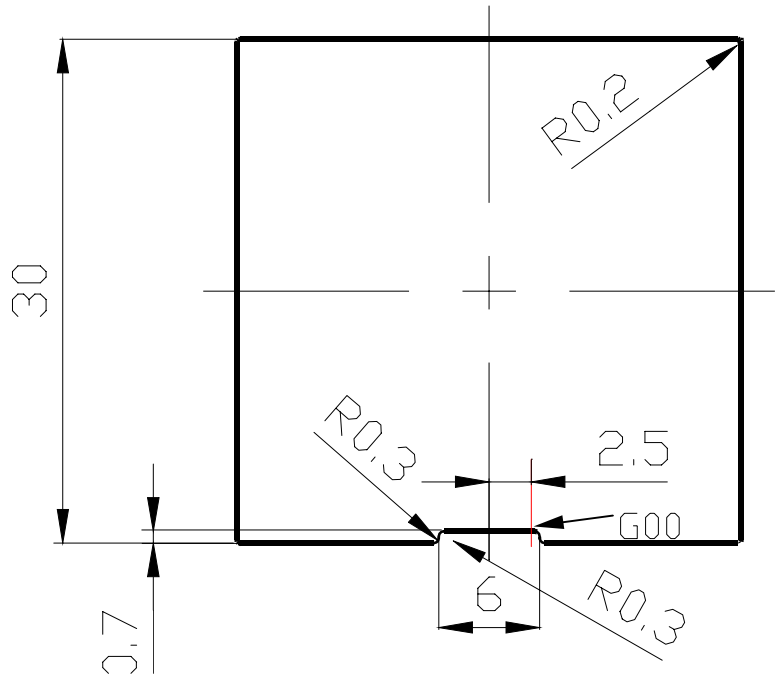
Fig. # 3b

Resulting Script File : example 3 / piece3.sbl

```
'$Include "jescript.sbh"
sub main
  ok = JE_Initiate
  if (ok=0) then
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"50",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"piece3",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,"0001",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut A 0.25",je_dim)
    ok=JE_Create(WORK,je_piece,je_grp,"work6")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_GEOMETRY,"AGIE.USING_work3.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_PUNCH,c_punch,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_TAPER,"7.5",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_TAPERMODE,c_isocon,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_CreateQuality(je_piece,"Q6","1.8,12.5,10.0",je_q1)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_QUALITY, je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_SEPCUT,"2",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_REVCUT,"T",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_POSX,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_POSY,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_POSZ,"-50",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_ENTRY,"2",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"work6")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_STP,"stp1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6",NULL,ID_STPMODE,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6","stp1",ID_POSX,"2.5",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6","stp1",ID_POSY,"-34",je_dim)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work6",ASDELETE,NULL)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work6",ASAGIE,NULL)
    ok=JE_ClosePiece(je_piece)
  else
   stop
  end if
end sub
```

9.5 Example 4 (piece 4): conic with iso radii

(ß 30x30, h = 50mm, 7.50)



Rounding radii = 4 x 0.2 mm and 4 x 0.3 mm

	material = Cold die Steel	Ra = 1.8 µm
	wire = Cobra Cut D 0.25	Tkm = ±10 µm
	reverse cut = true	Te = 10 -15 µm
Fig. # 4a	separation cut = 2 mm	

V/ISO-Code (contour): example 4 / work4.iso
(with absolute (a) values in X, Y and Z)

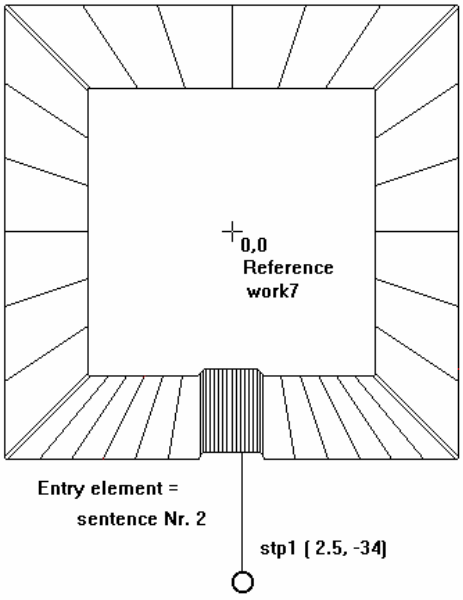
```
N00001 G00 X2.5 Y-14.3 Z0.0
       G00 X2.5 Y-20.882625 Z50.0 ;
N00002 G01 X2.7
       G01 X2.7 ;
N00003 G02 X3.0 Y-14.6 J-0.3
       G02 X3.0 Y-21.182625 J-0.3 ;
N00004 G01 Y-14.7
       G01 Y-21.282625 ;
N00005 G03 X3.3 Y-15.0 I0.3
       G03 X3.3 Y-21.582625 I0.3 ;
N00006 G01 X14.8
       G01 X21.382625 ;
N00007 G03 X15.0 Y-14.8 J0.2
       G03 X21.582625 Y-21.382625 J0.2 ;
N00008 G01 Y14.8
        G01 Y21.382625 ;
N00009 G03 X14.8 Y15.0 I-0.2
        G03 X21.382625 Y21.582625 I-0.2 ;
```

```
N00010 G01 X-14.8
       G01 X-21.382625 ;
N00011 G03 X-15.0 Y14.8 J-0.2
       G03 X-21.582625 Y21.382625 J-0.2 ;
N00012 G01 Y-14.8
       G01 Y-21.382625 ;
N00013 G03 X-14.8 Y-15.0 I0.2
       G03 X-21.382625 Y-21.582625 I0.2 ;
N00014 G01 X-3.3
       G01 X-3.3 ;
N00015 G03 X-3.0 Y-14.7 J0.3
       G03 X-3.0 Y-21.282625 J0.3 ;
N00016 G01 Y-14.6
       G01 Y-21.182625 ;
N00017 G02 X-2.7 Y-14.3 I0.3
       G02 X-2.7 Y-20.882625 I0.3 ;
N00018 G01 X2.5
       G01 X2.5 ;
N00019 M02 ;
```

Contour reference file: **example 4 / piece4.sbr**

AGIE.USING_[filename] IMPORT [filename];

in this example: AGIE.USING_work4.ISO IMPORT work4.ISO;



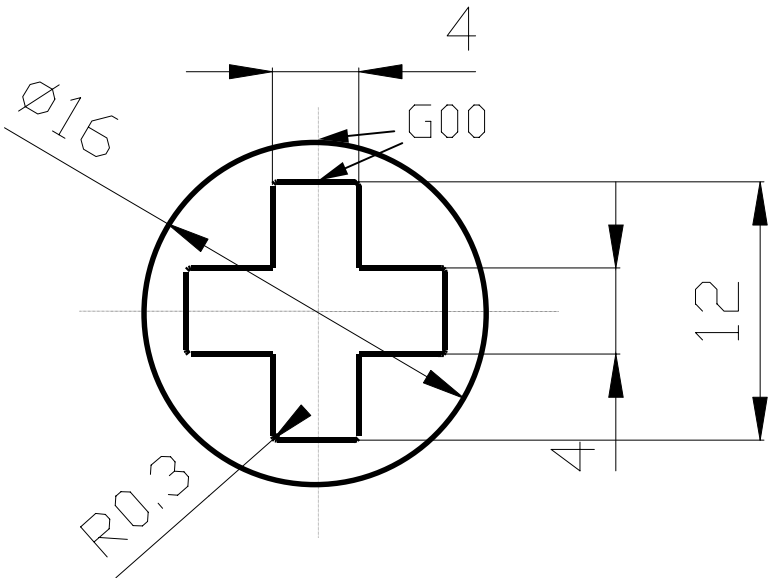
02395a_e.bmp

Fig. # 4b

Scriptfile: example 4 / piece4.sbl

```
'$Include "jescript.sbh"
sub main
  ok = JE_Initiate
  if (ok=0) then
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"50",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"piece4",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,”0001”,je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut A 0.25",je_dim)
    ok=JE_Create(WORK,je_piece,je_grp,"work7a")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_GEOMETRY,"AGIE.USING_work4.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_PUNCH,c_punch,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_CreateQuality(je_piece,”Q7”,”1.8,12.5,10.0”,je_q1)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_QUALITY, je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_SEPCUT,"2",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_REVCUT,"T",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_POSX,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_POSY,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_POSZ,"-50",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_ENTRY,"2",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"work7a")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_STP,"stp1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work7a",NULL,ID_STPMODE,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work7a","stp1",ID_POSX,"2.5",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work7a","stp1",ID_POSY,"-34",je_dim)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work7a",ASDELETE,NULL)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work7a",ASAGIE,NULL)
    ok=JE_ClosePiece(je_piece)
  else
    stop
  end if
end sub
```

9.6 Example 5 (piece 5): conic with radii and rough edges (h = 50mm)



Rounding radius = 8 x 0.3 mm

material = Cold die Steel
wire = Cobra Cut D 0.25

Ra = 1.8 µm
Tkm = ±10 µm
Te = 10 -15 µm

Fig. # 5a

V/ISO-Code (contour): example 5 / work5.iso
(with absolute (a) values in X, Y and Z)

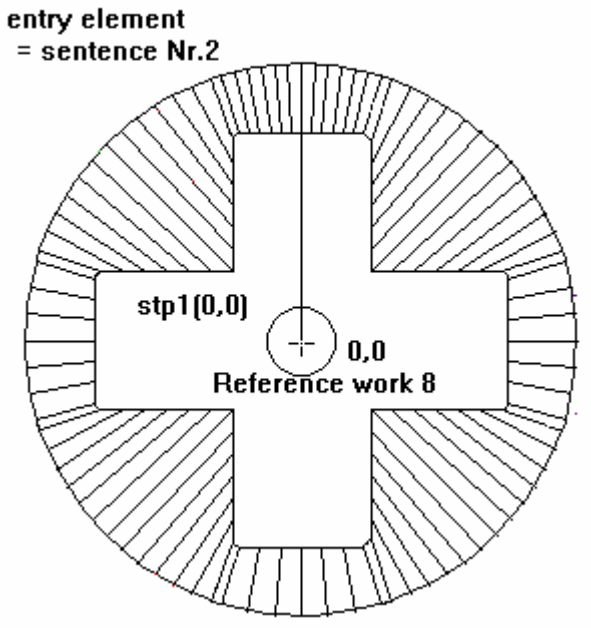
```
N00001 G00 X0.0 Y6.0 Z0.0
       G00 X0.0 Y8.0 Z50.0 ;
N00002 G01 X-1.7
       G03 X-2.180821 Y7.697014 J-8.0 ;
N00003 G03 X-2.0 Y5.7 J-0.3
       G03 X-2.648702 Y7.5488 I2.180821 J-7.697014 ;
N00004 G01 Y2.0
       G03 X-5.656854 Y5.656854 I2.648702 J-7.5488 ;
N00005 G01 X-5.7
       G03 X-7.5488 Y2.648702 I5.656854 J-5.656854 ;
N00006 G03 X-6.0 Y1.7 J-0.3
       G03 X-7.697014 Y2.180821 I7.5488 J-2.648702 ;
N00007 G01 Y-1.7
       G03 Y-2.180821 I7.697014 J-2.180821 ;
N00008 G03 X-5.7 Y-2.0 I0.3
       G03 X-7.5488 Y-2.648702 I7.697014 J2.180821 ;
N00009 G01 X-2.0
       G03 X-5.656854 Y-5.656854 I7.5488 J2.648702 ;
N00010 G01 Y-5.7
       G03 X-2.648702 Y-7.5488 I5.656854 J5.656854 ;
N00011 G03 X-1.7 Y-6.0 I0.3
       G03 X-2.180821 Y-7.697014 I2.648702 J7.5488 ;
N00012 G01 X1.7
       G03 X2.180821 I2.180821 J7.697014 ;
```

```
N00013 G03 X2.0 Y-5.7 J0.3
       G03 X2.648702 Y-7.5488 I-2.180821 J7.697014 ;
N00014 G01 Y-2.0
       G03 X5.656854 Y-5.656854 I-2.648702 J7.5488 ;
N00015 G01 X5.7
       G03 X7.5488 Y-2.648702 I-5.656854 J5.656854 ;
N00016 G03 X6.0 Y-1.7 J0.3
       G03 X7.697014 Y-2.180821 I-7.5488 J2.648702 ;
N00017 G01 Y1.7
       G03 Y2.180821 I-7.697014 J2.180821 ;
N00018 G03 X5.7 Y2.0 I-0.3
       G03 X7.5488 Y2.648702 I-7.697014 J-2.180821 ;
N00019 G01 X2.0
       G03 X5.656854 Y5.656854 I-7.5488 J-2.648702 ;
N00020 G01 Y5.7
       G03 X2.648702 Y7.5488 I-5.656854 J-5.656854 ;
N00021 G03 X1.7 Y6.0 I-0.3
       G03 X2.180821 Y7.697014 I-2.648702 J-7.5488 ;
N00022 G01 X0.0
       G03 X0.0 Y8.0 I-2.180821 J-7.697014 ;
N00023 M02 ;
```

Contour reference file: **example 5 / piece5.sbr**

AGIE.USING_[filename] IMPORT [filename];

in this example: AGIE.USING_work5.ISO IMPORT work5.ISO;



02406a_e.bmp

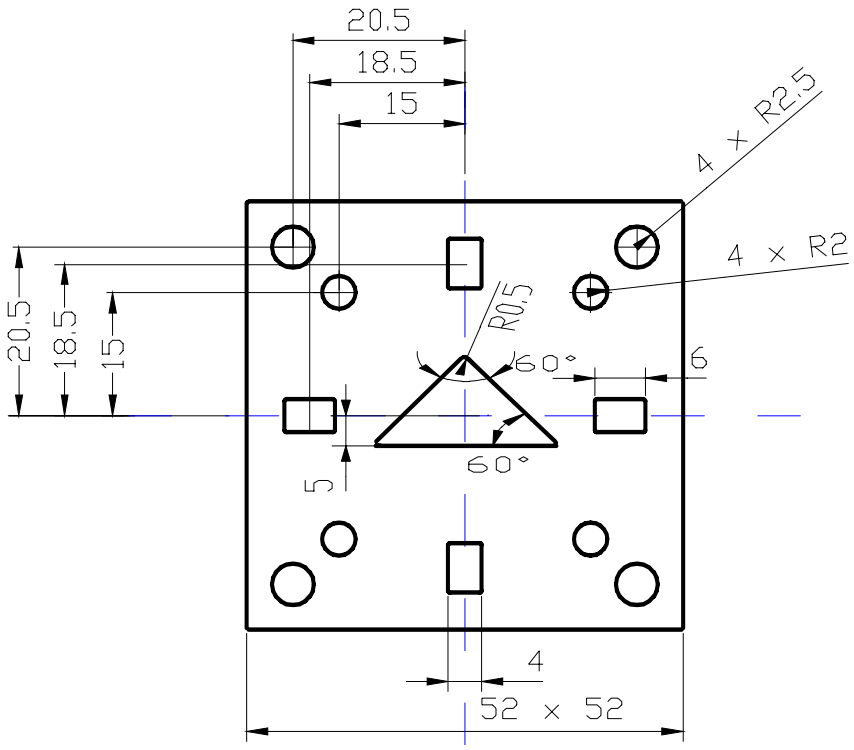
Fig. # 5b

Scriptfile: example 5 / piece5.sbl

```
'$Include "jescript.sbh"
sub main
  ok = JE_Initiate
  if (ok=0) then
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"50",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"piece5",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,”0001”,je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut D 0.25",je_dim)
    ok=JE_Create(WORK,je_piece,je_grp,"work8")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_GEOMETRY,"AGIE.USING_work5.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_PUNCH,c_die,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_CreateQuality(je_piece,”Q8”,”1.8,12.5,10.0”,je_q1)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_QUALITY, je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_POSX,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_POSY,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_POSZ,"-50",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_ENTRY,"2",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"work8")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_STP,"stp1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work8",NULL,ID_STPMODE,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work8","stp1",ID_POSX,"0",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work8","stp1",ID_POSY,"0",je_dim)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work8",ASDELETE,NULL)
    ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work8",ASAGIE,NULL)
    ok=JE_ClosePiece(je_piece)
  else
    stop
  end if
end sub
```

(h = 50mm)

9.7 Example 6 (piece 6): Piece with different works plus startpoint definitions



rounding radius = 0.2 mm height = 50 mm

WORK6_A to WORK6_H	Ra = 0.7 µm Tkm = ± 8 µm Te = 6 -10 µm	→ with 2 trim cuts
WORK6_I to WORK6_L	Ra = 1.8 µm Tkm = ±10 µm Te = 10 -15 µm	→ with 1 trim cut
WORK6_M to WORK6_N	Ra = 0.3 µm Tkm = ±3 µm Te = 2 - 6 µm	→ with 3 trim cuts

Fig. # 6a wire = Cobra Cut D 0.25 material = Cold die Steel

V/ISO-Code (contour):

example 6 / work6_A.iso to work6_N.iso
(with absolute values in X, Y and Z)

There are only 5 different geometries. The geometries are placed inside the Script.

V/ISO of WORK6_A.ISO for WORK6_A to WORK6_D:

```
N00001 G00 X-18.0 Y20.5 ;
N00002 G03 X-23.0 I-2.5 ;
```

N00003 G03 X-18.0 I2.5 ;
N00004 M02 ;

NC-CODE of WORK6_E.ISO for WORK6_E to WORK6_H:

N00001 G00 X-13.0 Y15.0 ;
N00002 G03 X-17.0 I-2.0 ;
N00003 G03 X-13.0 I2.0 ;
N00004 M02 ;

NC-CODE of WORK6_I.ISO for WORK6_I to WORK6_L:

N00001 G00 X0.0 Y21.5 ;
N00002 G01 X-1.8 ;
N00003 G03 X-2.0 Y21.3 J-0.2 ;
N00004 G01 Y15.7 ;
N00005 G03 X-1.8 Y15.5 I0.2 ;
N00006 G01 X1.8 ;
N00007 G03 X2.0 Y15.7 J0.2 ;
N00008 G01 Y21.3 ;
N00009 G03 X1.8 Y21.5 I-0.2 ;
N00010 G01 X0.0 ;
N00011 M02 ;

NC-CODE of WORK6_M.ISO:

N00001 G00 X0.0 Y-5.0 ;
N00002 G01 X7.794229 ;
N00003 G03 X8.227241 Y-4.25 J0.5 ;
N00004 G01 X0.433013 Y9.25 ;
N00005 G03 X-0.433013 I-0.433013 J-0.25 ;
N00006 G01 X-8.227241 Y-4.25 ;
N00007 G03 X-7.794229 Y-5.0 I0.433012 J-0.25 ;
N00008 G01 X0.0 ;
N00009 M02 ;

NC-CODE of WORK6_N.ISO for punch:

N00001 G00 X0.0 Y26.0 ;
N00002 G01 X-25.8 ;
N00003 G03 X-26.0 Y25.8 J-0.2 ;
N00004 G01 Y-25.8 ;
N00005 G03 X-25.8 Y-26.0 I0.2 ;
N00006 G01 X25.8 ;
N00007 G03 X26.0 Y-25.8 J0.2 ;
N00008 G01 Y25.8 ;
N00009 G03 X25.8 Y26.0 I-0.2 ;
N00010 G01 X0.0 ;
N00011 M02 ;

Contour reference file: example 6 / piece6.sbr

AGIE.USING_[filename] IMPORT [filename];

in this example:

AGIE.USING_work6_a.ISO IMPORT work6_a.ISO;
AGIE.USING_work6_e.ISO IMPORT work6_e.ISO;
AGIE.USING_work6_i.ISO IMPORT work6_i.ISO;
AGIE.USING_work6_m.ISO IMPORT work6_m.ISO;
AGIE.USING_work6_n.ISO IMPORT work6_n.ISO;

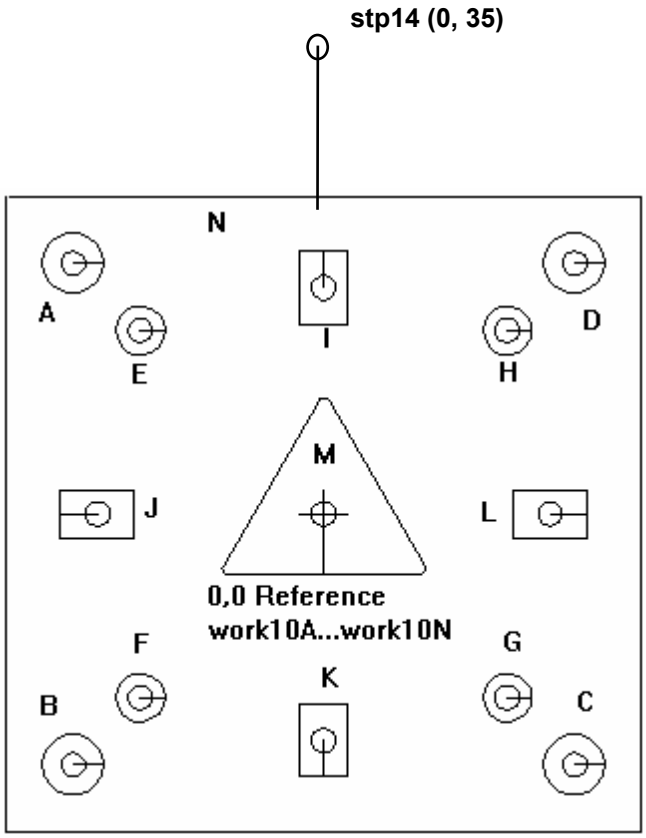


Fig. # 10b (02402a_e.bmp)

Scriptfile: example 6 / piece6.sbl

```
'$Include "jescript.sbh"
sub main
  ok = JE_Initiate
  if (ok=0) then
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"50",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"piece6",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,”0001”,je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut D 0.25",je_dim)
    'comment  *****  work6_a  *****
    ok=JE_Create(WORK,je_piece,je_grp,"work6_a")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_a",NULL,ID_GEOMETRY,"AGIE.USING_work6_a.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_a",NULL,ID_PUNCH,c_die,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_a",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_CreateQuality(je_piece,”Q10a”,”0.7,8.0,8.0”,je_q1)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_a",NULL,ID_QUALITY, je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_a",NULL,ID_POSX,"-20.5",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_a",NULL,ID_POSY,"20.5",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_a",NULL,ID_ENTRY,"2",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"work6_a")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_a",NULL,ID_STP,"stp1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_a",NULL,ID_STPMODE,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_a","stp1",ID_POSX,"-20.5",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_a","stp1",ID_POSY,"20.5",je_dim)
    'comment  *****  work6_b  *****
    ok=JE_Create(WORK,je_piece,je_grp,"work6_b")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_b",NULL,ID_GEOMETRY,"AGIE.USING_work6_a.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_b",NULL,ID_PUNCH,c_die,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_b",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_b",NULL,ID_QUALITY, je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_b",NULL,ID_POSX,"-20.5",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_b",NULL,ID_POSY,"-20.5",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_b",NULL,ID_ENTRY,"2",je_dim)
```

```
   ok=JE_CreateStartPoint(WORK,"stp2",je_piece,je_grp,"work6_b")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_b",NULL,ID_STP,"stp2",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_b",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_b","stp2",ID_POSX,"-20.5",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_b","stp2",ID_POSY,"-20.5",je_dim)
'comment  *****  work6_c  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_c")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_c",NULL,ID_GEOMETRY,"AGIE.USING_work6_a.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_c",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_c",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_c",NULL,ID_QUALITY, je_q1,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_c",NULL,ID_POSX,"20.5",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_c",NULL,ID_POSY,"-20.5",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_c",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp3",je_piece,je_grp,"work6_c")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_c",NULL,ID_STP,"stp3",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_c",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_c","stp3",ID_POSX,"20.5",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_c","stp3",ID_POSY,"-20.5",je_dim)
   'comment  *****  work6_d  *****
ok=JE_Create(WORK,je_piece,je_grp,"work6_d")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_d",NULL,ID_GEOMETRY,"AGIE.USING_work6_a.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_d",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_d",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_d",NULL,ID_QUALITY, je_q1,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_d",NULL,ID_POSX,"20.5",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_d",NULL,ID_POSY,"20.5",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_d",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp4",je_piece,je_grp,"work6_d")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_d",NULL,ID_STP,"stp4",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_d",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_d","stp4",ID_POSX,"20.5",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_d","stp4",ID_POSY,"20.5",je_dim)
'comment  *****  work6_e  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_e")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_e",NULL,ID_GEOMETRY,"AGIE.USING_work6_e.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_e",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_e",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_e",NULL,ID_QUALITY, je_q1,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_e",NULL,ID_POSX,"-15",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_e",NULL,ID_POSY,"15",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_e",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp5",je_piece,je_grp,"work6_e")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_e",NULL,ID_STP,"stp5",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_e",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_e","stp5",ID_POSX,"-15",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_e","stp5",ID_POSY,"15",je_dim)
   'comment  *****  work6_f  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_f")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_f",NULL,ID_GEOMETRY,"AGIE.USING_work6_e.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_f",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_f",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_f",NULL,ID_QUALITY, je_q1,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_f",NULL,ID_POSX,"-15",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_f",NULL,ID_POSY,"-15",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_f",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp6",je_piece,je_grp,"work6_f")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_f",NULL,ID_STP,"stp6",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_f",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_f","stp6",ID_POSX,"-15",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_f","stp6",ID_POSY,"-15",je_dim)
'comment  *****  work6_g  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_g")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_g",NULL,ID_GEOMETRY,"AGIE.USING_work6_e.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_g",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_g",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_g",NULL,ID_QUALITY, je_q1,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_g",NULL,ID_POSX,"15",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_g",NULL,ID_POSY,"-15",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_g",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp7",je_piece,je_grp,"work6_g")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_g",NULL,ID_STP,"stp7",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_g",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_g","stp7",ID_POSX,"15",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_g","stp7",ID_POSY,"-15",je_dim)
```

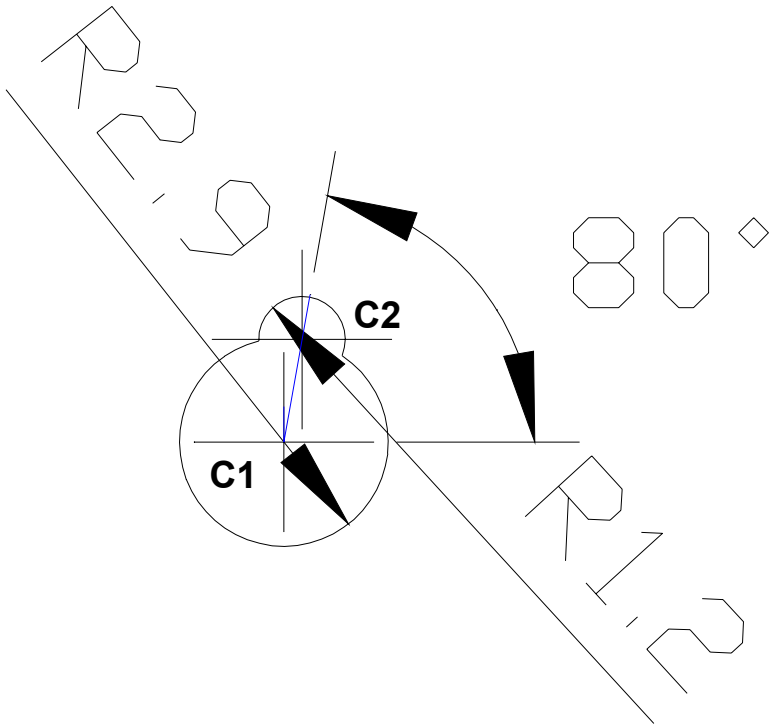
```
'comment  *****  work6_h  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_h")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_h",NULL,ID_GEOMETRY,"AGIE.USING_work6_e.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_h",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_h",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_h",NULL,ID_QUALITY, je_q1,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_h",NULL,ID_POSX,"15",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_h",NULL,ID_POSY,"15",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_h",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp8",je_piece,je_grp,"work6_h")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_h",NULL,ID_STP,"stp8",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_h",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_h","stp8",ID_POSX,"15",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_h","stp8",ID_POSY,"15",je_dim)
'comment  *****  work6_i  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_i")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_i",NULL,ID_GEOMETRY,"AGIE.USING_work6_i.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_i",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_i",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_CreateQuality(je_piece,"Q10i","1.8,12.5,10.0",je_q2)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_i",NULL,ID_QUALITY, je_q2,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_i",NULL,ID_POSX,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_i",NULL,ID_POSY,"18.5",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_i",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp9",je_piece,je_grp,"work6_i")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_i",NULL,ID_STP,"stp9",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_i",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_i","stp9",ID_POSX,"-0",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_i","stp9",ID_POSY,"18.5",je_dim)
'comment  *****  work6_j  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_j")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_GEOMETRY,"AGIE.USING_work6_i.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_QUALITY, je_q2,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_POSX,"-18.5",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_POSY,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_ROTATION,"90",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp10",je_piece,je_grp,"work6_j")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_STP,"stp10",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_j",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_j","stp10",ID_POSX,"-18.5",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_j","stp10",ID_POSY,"-0",je_dim)
'comment  *****  work6_k  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_k")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_GEOMETRY,"AGIE.USING_work6_i.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_QUALITY, je_q2,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_POSX,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_POSY,"-18.5",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_ROTATION,"180",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp11",je_piece,je_grp,"work6_k")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_STP,"stp11",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_k",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_k","stp11",ID_POSX,"0",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_k","stp11",ID_POSY,"-18.5",je_dim)
'comment  *****  work6_l  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_l")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_GEOMETRY,"AGIE.USING_work6_i.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_QUALITY, je_q2,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_POSX,"18.5",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_POSY,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_ROTATION,"270",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp12",je_piece,je_grp,"work6_l")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_STP,"stp12",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_l",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_l","stp12",ID_POSX,"18.5",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_l","stp12",ID_POSY,"0",je_dim)
```

```
'comment  *****  work6_m  *****
   ok=JE_Create(WORK,je_piece,je_grp,"work6_m")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_m",NULL,ID_GEOMETRY,"AGIE.USING_work6_m.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_m",NULL,ID_PUNCH,c_die,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_m",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_CreateQuality(je_piece,”Q10m”,”0.3,4.0,3.0”,je_q3)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_m",NULL,ID_QUALITY, je_q3,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_m",NULL,ID_POSX,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_m",NULL,ID_POSY,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_m",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp13",je_piece,je_grp,"work6_m")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_m",NULL,ID_STP,"stp13",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_m",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_m","stp13",ID_POSX,"0",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_m","stp13",ID_POSY,"0",je_dim)
   ok=JE_Create(WORK,je_piece,je_grp,"work6_n")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_n",NULL,ID_GEOMETRY,"AGIE.USING_work6_n.ISO",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_n",NULL,ID_PUNCH,c_punch,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_n",NULL,ID_ENTRYMODE,c_entper,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_n",NULL,ID_QUALITY, je_q3,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_n",NULL,ID_POSX,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_n",NULL,ID_POSY,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_n",NULL,ID_ENTRY,"2",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp14",je_piece,je_grp,"work6_n")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_n",NULL,ID_STP,"stp14",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"work6_n",NULL,ID_STPMODE,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_n","stp14",ID_POSX,"0",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"work6_n","stp14",ID_POSY,"35",je_dim)
   ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASDELETE,NULL)
   ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASAGIE,NULL)
   ok=JE_ClosePiece(je_piece)
else
   stop
 end if
end sub
```

9.8 Example 7 (piece 7): Pocketing

(h = 50 mm)

the offset must be set to zero!
ID_Punch = c_open) (open contour)



The centre of the circle with the radius of 2.9 mm is C1 = (-36.17, 22.01).

The centre of the circle with the radius of 1.2 mm is C2 = point of intersection between the radius of the bigger circle and a line rotated with 80 degrees,

material = Cold die Steel
Fig. # 7a wire = Cobra Cut D 0.25

V/ISO-Code (contour): example 7 / work7a.iso
(with absolute (a) values in X, Y and Z)

```
N00001 G00 X-36.17 Y22.01 ;
N00002 G01 X-36.150392 Y22.313367 ;
N00003 G02 X-36.189608 Y21.706633 I-0.019608 J-0.303367 ;
N00004 G02 X-36.150392 Y22.313367 I0.019608 J0.303367 ;
N00005 G01 X-36.140071 Y22.473034 ;
N00006 G02 X-36.199929 Y21.546966 I-0.029929 J-0.463034 ;
N00007 G02 X-36.140071 Y22.473034 I0.029929 J0.463034 ;
N00008 G01 X-36.129751 Y22.632701 ;
N00009 G02 X-36.210249 Y21.387299 I-0.040249 J-0.622701 ;
N00010 G02 X-36.129751 Y22.632701 I0.040249 J0.622701 ;
N00011 G01 X-36.119431 Y22.792367 ;
N00012 G02 X-36.220569 Y21.227633 I-0.050569 J-0.782367 ;
N00013 G02 X-36.119431 Y22.792367 I0.050569 J0.782367 ;
N00014 G01 X-36.109111 Y22.952034 ;
N00015 G02 X-36.230889 Y21.067966 I-0.060889 J-0.942034 ;
N00016 G02 X-36.109111 Y22.952034 I0.060889 J0.942034 ;
N00017 G01 X-36.098791 Y23.111701 ;
N00018 G02 X-36.241209 Y20.908299 I-0.071209 J-1.101701 ;
N00019 G02 X-36.098791 Y23.111701 I0.071209 J1.101701 ;
N00020 G01 X-36.08847 Y23.271368 ;
N00021 G02 X-36.25153 Y20.748632 I-0.08153 J-1.261368 ;
N00022 G02 X-36.08847 Y23.271368 I0.08153 J1.261368 ;
N00023 G01 X-36.07815 Y23.431035 ;
N00024 G02 X-35.770288 Y23.37675 I-0.09185 J-1.421035 ;
N00025 G02 X-36.417275 Y20.607634 I-0.399712 J-1.36675 ;
N00026 G02 X-36.07815 Y23.431035 I0.247275 J1.402366 ;
N00027 G01 X-36.06783 Y23.590702 ;
N00028 G02 X-35.725377 Y23.530318 I-0.10217 J-1.580702 ;
N00029 G02 X-35.863144 Y23.750264 I1.172043 J0.887251 ;
N00030 G02 X-36.06783 Y23.590702 I-1.002588 J1.075044 ;
N00031 G01 X-36.154676 Y23.72508 ;
N00032 G02 X-36.551453 Y23.553565 I-0.711056 J1.100228 ;
N00033 G03 X-36.446101 Y20.444156 I0.381453 J-1.543565 ;
N00034 G03 X-35.283621 Y23.330012 I0.276101 J1.565844 ;
N00035 G02 X-35.810449 Y24.049113 I0.730287 J1.087557 ;
N00036 G02 X-36.154676 Y23.72508 I-1.055283 J0.776195 ;
N00037 G01 X-36.241523 Y23.859459 ;
N00038 G02 X-36.589838 Y23.708893 I-0.624209 J0.965849 ;
N00039 G03 X-36.473884 Y20.286586 I0.419838 J-1.698893 ;
N00040 G03 X-35.194426 Y23.462844 I0.303884 J1.723414 ;
N00041 G02 X-35.620042 Y24.84726 I0.641092 J0.954725 ;
N00042 G03 X-35.716392 Y24.864249 I-0.046378 J0.018682 ;
N00043 G02 X-36.241523 Y23.859459 I-1.14934 J-0.038941 ;
N00044 G01 X-36.328369 Y23.993838 ;
N00045 G02 X-36.628224 Y23.86422 I-0.537363 J0.83147 ;
N00046 G03 X-36.501668 Y20.129017 I0.458224 J-1.85422 ;
N00047 G03 X-35.10523 Y23.595675 I0.331668 J1.880983 ;
N00048 G02 X-35.47163 Y24.787477 I0.551896 J0.821894 ;
N00049 G03 X-35.8763 Y24.858831 I-0.19479 J0.078465 ;
N00050 G02 X-36.328369 Y23.993838 I-0.989432 J-0.033523 ;
N00051 G01 X-36.415216 Y24.128217 ;
N00052 G02 X-36.666609 Y24.019547 I-0.450516 J0.697091 ;
N00053 G03 X-36.529452 Y19.971448 I0.496609 J-2.009547 ;
N00054 G03 X-35.016035 Y23.728506 I0.359452 J2.038552 ;
N00055 G02 X-35.323219 Y24.727694 I0.462701 J0.689063 ;
N00056 G03 X-36.036208 Y24.853413 I-0.343201 J0.138248 ;
```

```
N00057 G02 X-36.415216 Y24.128217 I-0.829524 J-0.028105 ;
N00058 G01 X-36.502062 Y24.262596 ;
N00059 G02 X-36.704994 Y24.174874 I-0.36367 J0.562712 ;
N00060 G03 X-36.557236 Y19.813879 I0.534994 J-2.164874 ;
N00061 G03 X-34.926839 Y23.861338 I0.387236 J2.196121 ;
N00062 G02 X-35.174807 Y24.667911 I0.373505 J0.556231 ;
N00063 G03 X-36.196116 Y24.847995 I-0.491613 J0.198031 ;
N00064 G02 X-36.502062 Y24.262596 I-0.669616 J-0.022687 ;
N00065 G01 X-36.588909 Y24.396975 ;
N00066 G02 X-36.743379 Y24.330202 I-0.276823 J0.428333 ;
N00067 G03 X-36.585019 Y19.65631 I0.573379 J-2.320202 ;
N00068 G03 X-34.837644 Y23.994169 I0.415019 J2.35369 ;
N00069 G02 X-35.026396 Y24.608128 I0.28431 J0.4234 ;
N00070 G03 X-36.356025 Y24.842577 I-0.640024 J0.257814 ;
N00071 G02 X-36.588909 Y24.396975 I-0.509707 J-0.017269 ;
N00072 G01 X-36.675755 Y24.531354 ;
N00073 G02 X-36.781764 Y24.485529 I-0.189977 J0.293954 ;
N00074 G03 X-36.612803 Y19.49874 I0.611764 J-2.475529 ;
N00075 G03 X-34.748449 Y24.127001 I0.442803 J2.51126 ;
N00076 G02 X-34.877984 Y24.548345 I0.195115 J0.290568 ;
N00077 G03 X-36.515933 Y24.837159 I-0.788436 J0.317597 ;
N00078 G02 X-36.675755 Y24.531354 I-0.349799 J-0.011851 ;
N00079 G01 X-36.762602 Y24.665733 ;
N00080 G02 X-36.82015 Y24.640856 I-0.10313 J0.159575 ;
N00081 G03 X-36.640586 Y19.341171 I0.65015 J-2.630856 ;
N00082 G03 X-34.659253 Y24.259832 I0.470586 J2.668829 ;
N00083 G02 X-34.729572 Y24.488562 I0.105919 J0.157737 ;
N00084 G03 X-36.675841 Y24.831741 I-0.936848 J0.37738 ;
N00085 G02 X-36.762602 Y24.665733 I-0.189891 J-0.006433 ;
N00086 M02 ;
```

Contour reference file: **example 7 / piece7.sbr**

AGIE.USING_[filename] IMPORT [filename];
in this example:

AGIE.USING_work7a.ISO IMPORT work7a.ISO;
AGIE.USING_work7b.ISO IMPORT work7b.ISO;

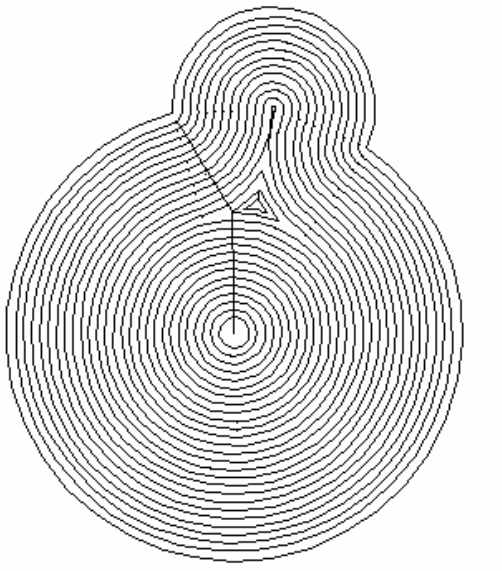
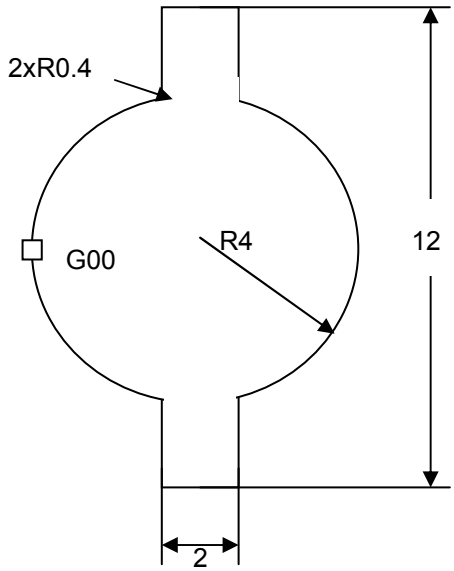


Fig. # 7b (02403a_e.bmp)

Scriptfile: example7 / piece7.sbl

```
'comment1 Pocketing with trim cuts
'$Include "jescript.sbh"
sub main
  ok = JE_Initiate
  if (ok=0) then
    ok=JE_GenerateAttrib(c_tecuser,"0")  ' Do not change the user tec for pocketings
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"piece7",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,"0001",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut D 0.25",je_dim)
    ok=JE_Create(GROUP,je_piece,"poc_grp",NULL)
    ok=JE_AttribObject(GROUP,SETATTR,je_piece,"poc_grp",NULL,NULL,ID_SORTOF,c_pocketing,je_dim)
    ok=JE_Create(WORK,je_piece,"poc_grp","work7a")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,ID_SORTOF,c_pocketing1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,
                       ID_GEOMETRY,"AGIE.USING_work7a.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,ID_PUNCH,c_open,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,ID_POSX,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,ID_POSY,"0",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp1",je_piece,"poc_grp","work7a")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,ID_STPENTRY,"stp1",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,ID_STPOPEN,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"poc_grp","work7a","stp1",ID_POSX,"-36.17",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"poc_grp","work7a","stp1",ID_POSY,"22.01",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"poc_grp","work7a","stp1",ID_DIAMETER,"2",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp2",je_piece,"poc_grp","work7a")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,ID_STPEXIT,"stp2",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7a",NULL,ID_STPOPEX,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"poc_grp","work7a","stp2",ID_POSX,"-36.17",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"poc_grp","work7a","stp2",ID_POSY,"22.01",je_dim)
    ok=JE_GenerateCuts(WORK,je_piece,"poc_grp","work7a",ASDELETE,NULL)
    ok=JE_GenerateCuts(WORK,je_piece,"poc_grp","work7a",ASUSER,"tecuser1")

  'Trim cuts
    ok=JE_Create(WORK,je_piece,"poc_grp","work7b")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7b",NULL,ID_SORTOF,c_pocketing2,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7b",NULL,
                       ID_GEOMETRY,"AGIE.USING_work7b.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7b",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7b",NULL,ID_PUNCH,c_die,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7b",NULL,ID_POSX,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7b",NULL,ID_POSY,"0",je_dim)
    ok=JE_CreateStartPoint(WORK,"stp3",je_piece,"poc_grp","work7b")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7b",NULL,ID_STP,"stp3",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"poc_grp","work7b",NULL,ID_STPMODE,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"poc_grp","work7b","stp3",ID_POSX,"-36.17",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"poc_grp","work7b","stp3",ID_POSY,"22.01",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"poc_grp","work7b","stp3",ID_DIAMETER,"2",je_dim)
    ok=JE_GenerateCuts(WORK,je_piece,"poc_grp","work7b",ASDELETE,NULL)
    ok=JE_GenerateCuts(WORK,je_piece,"poc_grp","work7b",ASUSER,"tecuser2")
    ok=JE_ClosePiece(je_piece)
  else
    stop
  end if
end sub
```

Example 8: Points and sectors



Height = 30 mm, rounding radii where not marked = 0

Wire = Cobra Cut D 0.25, material = Cold die Steel

Dimensions of piece: 120x100 mm with reference in the centre of the upper plane (Z=0)

Fig. #8a

The Scriptfile for this example is shown below:

```
'script file to test all new functions for 0203
'$include "jescript.sbh"

sub main
ok = JE_Initiate
  if (ok=0) then
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"T0203",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"30.0000",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,"0001",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut D 0.25",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_DIML,"120",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_DIMB,"100",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POSPOSX,"-60",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POSPOSY,"-50",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POSPOSZ,"-30",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_VALSECP,"0.1",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_VALRETP,"20",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POSX,"60",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POSY,"80",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POSZ,"10",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_ROTATION,"45",je_dim)
ok=JE_CreateQuality(je_piece,"Qual_fine","0.3,4.0,1.0",je_q1)
ok=JE_Create(WORK,je_piece,je_grp,"lav_d1")
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_GEOMETRY,"AGIE.USING_test0203.ISO",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_PUNCH,c_punch,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_QUALITY,je_q1,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_POSX,"-5.0",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_POSY,"0.0",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_ENTRY,"2",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_ENTRYMODE,c_entlib,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_SEPCUT,"0.3",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_REVCUT,"T",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_COMMPOINTENTRY,"2.0",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_COMMPOINTEXIT,"2.0",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_CLEARENCETRENN,"0.002",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_ASWITHOUT,"2",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_RADIUSMINLA,"T",je_dim)
ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"lav_d1")
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_STP,"stp1",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d1",NULL,ID_STPMODE,c_work,je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"lav_d1","stp1",ID_POSX,"5.0000",je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"lav_d1","stp1",ID_POSY,"0.0000",je_dim)
ok=JE_CreatePoint("pt1",je_piece,je_grp,"lav_d1")
ok=JE_CreatePoint("pt2",je_piece,je_grp,"lav_d1")
ok=JE_CreatePoint("pt3",je_piece,je_grp,"lav_d1")
ok=JE_CreatePoint("pt4",je_piece,je_grp,"lav_d1")
ok=JE_CreatePoint("pt5",je_piece,je_grp,"lav_d1")
ok=JE_CreatePoint("pt6",je_piece,je_grp,"lav_d1")
```

```
ok=JE_CreatePoint("pt7",je_piece,je_grp,"lav_d1")
ok=JE_CreatePoint("pt8",je_piece,je_grp,"lav_d1")
ok=JE_CreateSector("s1",je_piece,je_grp,"lav_d1")
ok=JE_CreateSector("s2",je_piece,je_grp,"lav_d1")
ok=JE_CreateSector("s3",je_piece,je_grp,"lav_d1")
ok=JE_CreateSector("s4",je_piece,je_grp,"lav_d1")
ok=JE_CreateSector("s5",je_piece,je_grp,"lav_d1")
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt1",ID_NSENTENCE,"3",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt1",ID_PERSENTENCE,"0.0",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt2",ID_NSENTENCE,"6",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt2",ID_PERSENTENCE,"0.50",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt3",ID_NSENTENCE,"8",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt3",ID_PERSENTENCE,"0.2",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt4",ID_NSENTENCE,"8",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt4",ID_PERSENTENCE,"0.8",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt5",ID_NSENTENCE,"10",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt5",ID_PERSENTENCE,"0.0",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt6",ID_NSENTENCE,"10",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt6",ID_PERSENTENCE,"1.0",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt7",ID_NSENTENCE,"11",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt7",ID_PERSENTENCE,"0.0",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt8",ID_NSENTENCE,"11",je_dim)
ok=JE_AttribObject(POINT,SETATTR,je_piece,je_grp,"lav_d1","pt8",ID_PERSENTENCE,"1.0",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",ID_SECT_PS,"pt5",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",ID_SECT_PF,"pt6",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",ID_SECT_TYPE,c_sector_cle,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s1",ID_SECT_CLEARANCE,"0.005",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s2",ID_SECT_PS,"pt1",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s2",ID_SECT_PF,"pt2",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s2",ID_SECT_TYPE,c_sector_tap,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s2",ID_SECT_TAPERMODE,c_fixcon,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s2",ID_SECT_TAPERT,"-2",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s2",ID_SECT_TAPERP,"-2",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s3",ID_SECT_PS,"pt3",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s3",ID_SECT_PF,"pt4",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s3",ID_SECT_TYPE,c_sector_tap,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s3",ID_SECT_TAPERMODE,c_stdcon,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s3",ID_SECT_TAPERT,"-1",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s4",ID_SECT_PS,"pt1",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s4",ID_SECT_PF,"pt2",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s4",ID_SECT_TYPE,c_sector_rad,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s4",ID_SECT_E_TYPE,c_radius_sv,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s5",ID_SECT_PS,"pt7",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s5",ID_SECT_PF,"pt8",je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s5",ID_SECT_TYPE,c_sector_pos,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s5",ID_SECT_POS,c_sector_tposmain,je_dim)
ok=JE_AttribObject(SECTOR,SETATTR,je_piece,je_grp,"lav_d1","s5",ID_SECT_SPEEDPOS,"0.2",je_dim)
ok=JE_Create(WORK,je_piece,je_grp,"lav_d2")
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_GEOMETRY,"AGIE.USING_test0203.ISO",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_PUNCH,c_punch,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_ROTATION,"180",je_dim)
```

```
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_QUALITY,je_q1,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_POSX,"5.0",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_POSY,"0.0",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_ENTRY,"2",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_ENTRYMODE,c_entlib,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_SEPCUT,"0.3",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_REVCUT,"T",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_COMMPOINTENTRY,"2.0",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_COMMPOINTEXIT,"2.0",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_CLEARENCETRENN,"0.002",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_I_TYPE,c_radius_sv,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_E_TYPE,c_radius_rf,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_E_VALUE,"0.3",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_TAPERMODE,c_fixcon,je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_TAPER,"0.4",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_TAPERP,"0.5",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_ASWITHOUT,"2",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_RADIUSMINLA,"T",je_dim)
ok=JE_CreateStartPoint(WORK,"stp1",je_piece,je_grp,"lav_d2")
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_STP,"stp1",je_dim)
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"lav_d2",NULL,ID_STPMODE,c_work,je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"lav_d2","stp1",ID_POSX,"5.0000",je_dim)
ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"lav_d2","stp1",ID_POSY,"0.0000",je_dim)
ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASDELETE,NULL)
ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASAGIE,NULL)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_EVTACT,"WEIA+8043+0;0;0;1;0;0;0;0;0;0;13;14;+",je_dim)
ok=JE_AttribObject(ASCH,SETATTR,je_piece,je_grp,NULL,"1",ID_EVTACT,"SERPpt1+8014+;+",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_ASG,"test1",je_dim)
ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_STATEGY,"A",je_dim)
ok=JE_ClosePiece(je_piece)
  else
    stop
 end if
end sub

_
```

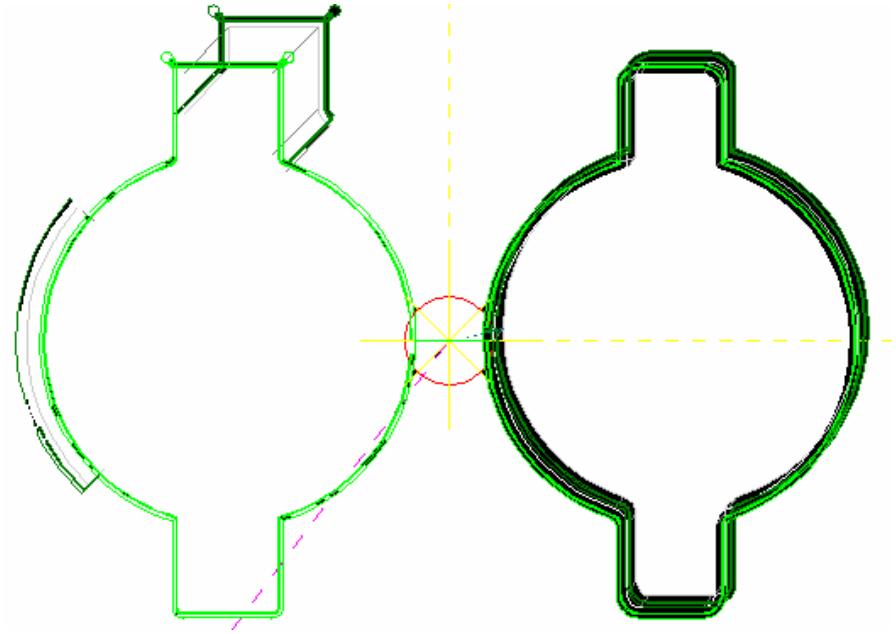
The Isocode test0203.ISO is shown below:

```
N00001 G00 X4.0 Y0.0 ;
N00002 G03 X1.272727 Y3.792119 I-4.0 ;
N00003 G02 X1.0 Y4.171331 I0.127273 J0.379212 ;
N00004 G01 Y6.0 ;
N00005 G01 X-1.0 ;
N00006 G01 Y4.171331 ;
N00007 G02 X-1.272727 Y3.792119 I-0.4 ;
N00008 G03 X-1.0 Y-3.872983 I1.272727 J-3.792119 ;
N00009 G01 Y-6.0 ;
N00010 G01 X1.0 ;
N00011 G01 Y-3.872983 ;
N00012 G03 X4.0 Y0.0 I-1.0 J3.872983 ;
N00013 M02 ;
```

The used sectors and Points are described in following table:

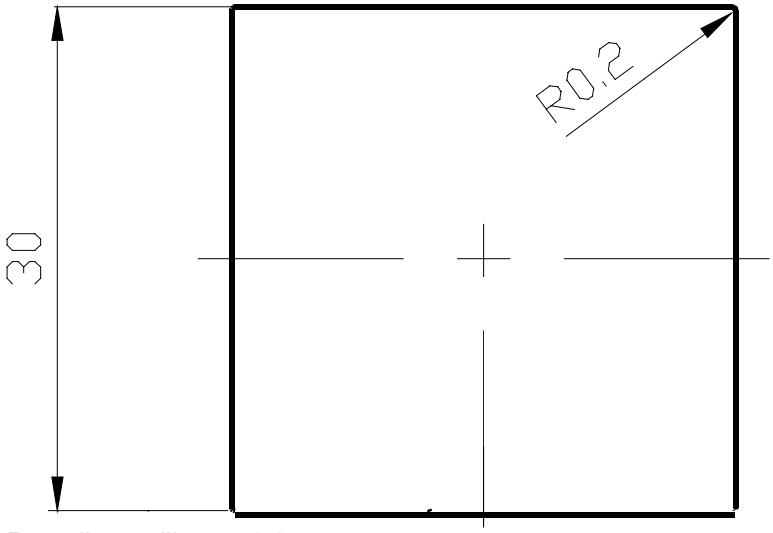
Sector name	Sector type	Initial point	Final point	Initial Sentence bloc (percentage)	Final Sentence bloc (percentage)
S1	Clearance	pt5	pt6	N00010 (0%)	N00010 (100%)
S2	Fixed taper	pt1	pt2	N00003 (0%)	N00006 (50%)
S3	Standard taper	pt3	pt4	N00008 (20%)	N00008 (80%)
S4	sharp edges	pt1	pt2	N00003 (0%)	N00006 (50%)
S5	Positioning	pt7	pt8	N00011 (0%)	N00011 (100%)

The resulting graphic check gives following drawing:



9.10 Example 9: Collar of Type 3

Height of PIECE 9: 30mm



Rounding radii = 4 x 0.2 mm

	material = Cold die steel	Ra = 1.8 μm
	wire = CCA 0.25	Tkm = ±10 μm
	reverse cut = true	Te = 10-15 μm
Fig. # 9a	Separation cut = 2mm	
	Clearance = 0.015	

V/ISO-Code (contour): example 3 / work3.iso
(with absolute (a) values in X, Y and Z)

```
N00001 G00 X2.5 Y-15.0 ;
N00002 G01 X14.8 ;
N00003 G03 X15.0 Y-14.8 J0.2 ;
N00004 G01 Y14.8 ;
N00005 G03 X14.8 Y15.0 I-0.2 ;
N00006 G01 X-14.8 ;
N00007 G03 X-15.0 Y14.8 J-0.2 ;
N00008 G01 Y-14.8 ;
N00009 G03 X-14.8 Y-15.0 I0.2 ;
N00010 G01 X2.5 ;
N00011 M02 ;
```

Side View of PIECE 9:

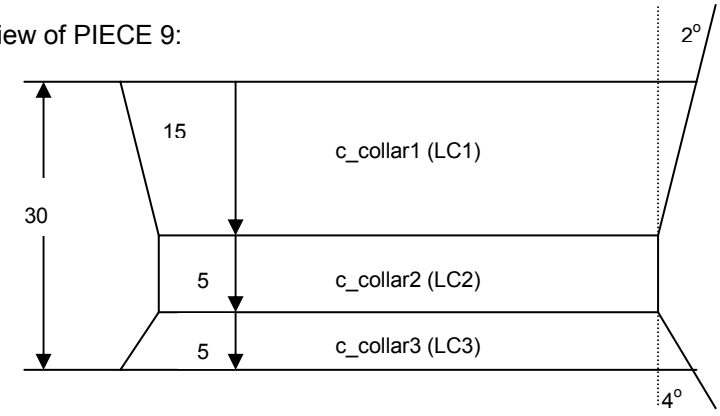


Fig # 3b

Contour Reference file: Example9 / piece9.sbr

AGIE.USING_[filename] IMPORT [filename];

In this example: AGIE.USING_work9.iso IMPORT work9.iso;

Resulting Script File: example 9 / piece9.sbl

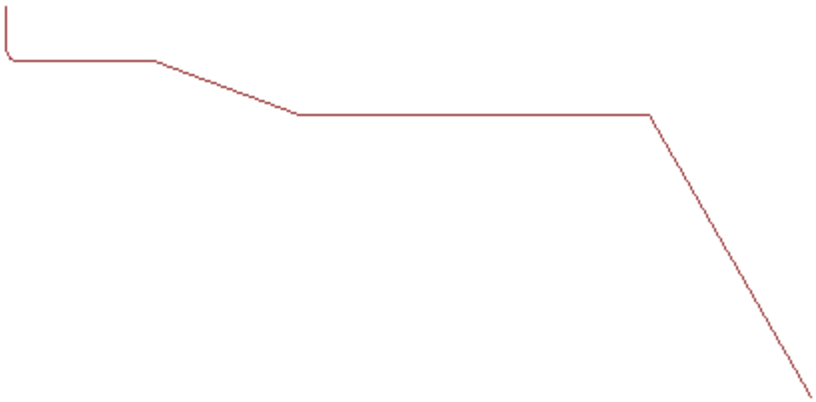
```
'$Include "jescript.sbh"
sub main
  ok=JE_Initiate
  if (ok=0) then
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"30.000",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"piece1",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,"0001",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut A 0.25",je_dim)
' First create collar group
    ok=JE_Create(GROUP,je_piece,"EXAMP_09",NULL)
    ok=JE_AttribObject(GROUP,SETATTR,je_piece,"EXAMP_09",NULL,NULL,ID_SORTOF,c_collar,je_dim)
    ok=JE_AttribObject(GROUP,SETATTR,je_piece,"EXAMP_09",NULL,NULL,ID_COLLAR,c_collar3,je_dim)
    ok=JE_CreateStartPoint(GROUP,"stp1a",je_piece,"EXAMP_09",NULL)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"EXAMP_09",NULL,"stp1a",ID_POSX,"10",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,"EXAMP_09",NULL,"stp1a",ID_POSY,"10",je_dim)
' Create Upper conic machining
    ok=JE_Create(WORK,je_piece,"EXAMP_09","LC1")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_GEOMETRY,"AGIE.USING_work9.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_PUNCH,c_die,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_CreateQuality(je_piece,"Q1a2","0.30,4.0,4.0",je_q1)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_HEIGHT,"30.00",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_QUALITY,je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_SORTOF,c_collar1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_POSZ,"-15.000",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_TAPER,"2.000",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_TAPERMODE,c_stdcon,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_SEPCUT,"3.000",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_REVCUT,"T",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_CLEARANCE,"0.015",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_POSX,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_POSY,"0",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_ENTRY,"6",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_STP,"stp1a",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC1",NULL,ID_STPMODE,c_group,je_dim)
' Create cilindrical part
    ok=JE_Create(WORK,je_piece,"EXAMP_09","LC2")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_GEOMETRY,"AGIE.USING_work9.ISO",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_PUNCH,c_die,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_ENTRYMODE,c_entper,je_dim)
    ok=JE_CreateQuality(je_piece,"Q1a2","0.30,4.0,4.0",je_q1)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_QUALITY,je_q1,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_SORTOF,c_collar2,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_HEIGHT,"5.00",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_POSZ,"-15.000",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_TAPER,"0.000",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_TAPERMODE,c_stdcon,je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_SEPCUT,"3.000",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_REVCUT,"T",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_CLEARANCE,"0.015",je_dim)
```

```
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_POSX,"0",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_POSY,"0",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_ENTRY,"6",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_STP,"stp1a",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC2",NULL,ID_STPMODE,c_group,je_dim)
  ok=JE_Create(WORK,je_piece,"EXAMP_09","LC3")
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_GEOMETRY,"AGIE.USING_work9.ISO",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_PUNCH,c_die,je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_ENTRYMODE,c_entper,je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_ENTRY,"6",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_STP,"stp1a",je_dim
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_STPMODE,c_group,je_dim)
  ok=JE_CreateQuality(je_piece,"Q1a3","0.90,13.0,8.0",je_q2)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_QUALITY,je_q2,je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_SORTOF,c_collar3,je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_HEIGHT,"15.00",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_POSZ,"-20.000",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_TAPER,"-4.000",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_TAPERMODE,c_stdcon,je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_POSX,"0",je_dim)
  ok=JE_AttribObject(WORK,SETATTR,je_piece,"EXAMP_09","LC3",NULL,ID_POSY,"0",je_dim)
  ok=JE_GenerateCuts(PIECE,je_piece,NULL,NULL,ASDELETE,NULL)
  ok=JE_GenerateCuts(PIECE,je_piece,NULL,NULL,ASAGIE,NULL)
  ok=JE_ClosePiece(je_piece)
 else
  stop
 end if
end sub
```

9.11 Example 10: Auxiliary Axis AU1

As it is very difficult to show a real example of geometry using auxiliary axes, we will only show an example of a geometry using a rotating auxiliary axis and an SBL which positions the Auxiliary axis before beginning with erosion.

The V/ISO code could look like following:



```
N00001 G00 X+127.717436 Y+10.624000 Z+0.000000 AU1+355.745738
     G00 X+127.717236 Y+10.621000 Z+26.200000 ;
N00002 G90 ;
N00003 G01 X+127.717236 Y-1.578351 AU1+355.745738
     G01 X+127.717236 Y-1.578351 ;
N00004 G01 X+123.917236 Y-1.578351 AU1+355.745738
     G01 X+123.917236 Y-1.578351 ;
N00005 G01 X+121.551519 Y-1.578351 AU1+355.745738
     G01 X+123.873734 Y-1.578351 ;
N00006 G01 X+121.255127 Y-1.070167 AU1+355.808281
     G01 X+123.477427 Y-1.070167 ;
N00007 G01 X+120.754712 Y-0.531907 AU1+355.820827
     G01 X+123.250915 Y-0.531907 ;
N00008 G01 X+120.662281 Y-0.023575 AU1+355.833366
     G01 X+122.957787 Y-0.023575 ;
N00009 G01 X+120.365831 Y+0.787831 AU1+355.875907
     G01 X+122.658033 Y+0.787831 ;
N00010 G01 X+120.069361 Y+0.993310 AU1+355.858748
     G01 X+122.361564 Y+0.993310 ;
N00011 G01 X+119.772873 Y+1.501863 AU1+355.870989
     G01 X+122.125076 Y+1.501863 ;
N00012 G01 X+119.476366 Y+2.010489 AU1+355.883528
     G01 X+121.868569 Y+2.010489 ;
N00013 G01 X+119.179839 Y+2.519188 AU1+355.896068
     G01 X+121.472042 Y+2.519188 ;
N00014 G01 X+118.883603 Y+3.027438 AU1+355.908606
     G01 X+121.175806 Y+3.027438 ;
N00015 G01 X+118.578274 Y+3.547576 AU1+357.659550
     G01 X+120.870477 Y+3.547576 ;
N00016 G01 X+118.543403 Y+3.607681 AU1+357.659550
     G01 X+120.835606 Y+3.607681 ;
N00017 G01 X+118.473314 Y+3.607681 AU1+357.659550
     G01 X+120.765517 Y+3.607681 ;
N00018 G01 X+116.862312 Y+3.607681 AU1+357.716534
     G01 X+119.154515 Y+3.607681 ;
N00019 G01 X+115.251309 Y+3.607681 AU1+357.773508
     G01 X+117.543512 Y+3.607681 ;
N00020 G01 X+113.640307 Y+3.607681 AU1+357.726483
     G01 X+115.932510 Y+3.607681 ;
N00021 M02 ;
```

The associated SBL could be like following:

```
'$Include "jescript.sbh"
sub arb001
   ok=JE_Create(WORK,je_piece,je_grp,"arb001")
ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_GEOMETRY,"AGIE.USING_arb001.ISO",je_dim
)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_PUNCH,c_left,je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_SEPCUT,"0",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_POSX,"+0.000",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_POSY,"+0.000",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_POSZ,"-30.000",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_POSA1,"+12.000",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_ENTRY,"1",je_dim)
   ok=JE_CreateStartPoint(WORK,"stp001",je_piece,je_grp,"arb001")
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_STPENTRY,"stp001",je_dim)
   ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_STPOPEN,c_work,je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp001",ID_POSX, "+150.000",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp001",ID_POSY, "+100.000",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp001",ID_POSZ,"+0.000",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp001",ID_STP_A1, "+10.089",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp001",ID_POSX_S, "+0.000",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp001",ID_POSY_S, "+0.000",je_dim)
   ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp001",ID_POSZ_S, "+30.000000",je_dim)
```

```
    ok=JE_CreateStartPoint(WORK,"stp002",je_piece,je_grp,"arb001")
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_STPEXIT,"stp002",je_dim)
    ok=JE_AttribObject(WORK,SETATTR,je_piece,je_grp,"arb001",NULL,ID_STPOPEX,c_work,je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp002",ID_POSX, "+67.426",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp002",ID_POSY, "+14.254",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp002",ID_POSZ, "+0.000",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp002",ID_STP_A1, "+10.089",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp002",ID_POSX_S, "+4.216",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp002",ID_POSY_S, "+0.600",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp002",ID_POSZ_S, "+30.000",je_dim)
    ok=JE_AttribObject(STARTPOINT,SETATTR,je_piece,je_grp,"arb001","stp002",ID_STP_F1,"1",je_dim)
end sub

sub main
  ok = JE_Initiate
  if (ok=0) then
    ok=JE_GenerateAttrib(c_tecauto,c_tecauto_t)
    ok=JE_GenerateAttrib(c_tecassign,c_tecass_fi)
    ok=JE_GenerateAttrib(c_tecalert,c_tecalert_sea)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POS_X,"+30.000000",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POS_Y,"+100.000000",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POS_Z,"+60.000000",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_POSA1,"-20.000000",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_HEIGHT,"3",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_NOMEOBJ,"wkst1",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_THREAD,"Cobra Cut A 0.25",je_dim)
    ok=JE_AttribObject(PIECE,SETATTR,je_piece,je_grp,NULL,NULL,ID_MATERIAL,"0001",je_dim)
    arb001
    ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASDELETE,NULL)
    ok=JE_GenerateCuts(PIECE,je_piece,je_grp,NULL,ASUSER,"hsns3_1")
else
    stop
  end if
end sub
```

10 Addendum A

10.1 Description of Events for the SCRIPT

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A. Code of Event

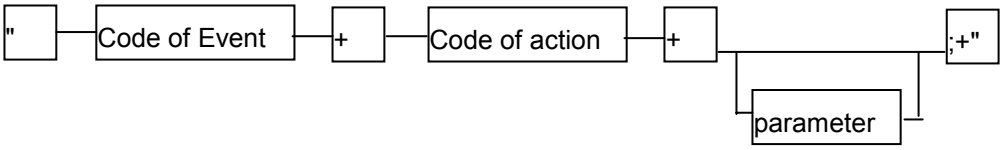
Description Text of Description

USE

See C3.5 and C4.0 of the machine manuals

ACTION	CODE FOR SCRIPT
• **Title of Action**	• **Code of Action**
Argument	
Parameters	Value of parameter
	Final CODE OF SCRIPT

Description how the Code for the Script is built:



B. List of not mentioned Events

There are some less important events, which aren't documented here, but still could be used in the SCRIPT. These are:

ACAB	Machining: Check movements: Interrupted
ACFA	Machining: Check movements: Absolute End
ACFI	Machining: Check movements: End
ACIA	Machining: Check movements: Absolute beginning
ACIN	Machining: Check movements: Beginning
ACRO	Machining: Check movements: Behaviour when radius smaller than offset
ACRS	Machining: Check movements: Type of return to start point
ACSF	Machining: Check movements: Drop-out part to be fixed
ACSR	Machining: Check movements: Drop-out part to be removed
AEAB	Machining: Erosion: Interrupted
AECX	Machining: Erosion: Short circuit nth mm close to sep. cut
AESC	Machining: Erosion: Startpoint reached in short-circuit or short > … mm
GCAB	Group: Check movements: Interrupted
GCFA	Group: Check movements: Absolute end
GCFI	Group: Check movements: End
GCIA	Group: Check movements: Absolute beginning
GCIN	Group: Check movements: Beginning
GEAB	Group: Erosion: Interrupted
IEUN	Startpoint: Movements check: Not used
IEUN	Startpoint: Erosion: Not used
IIUN	Startpoint: Threading Check: Not used
IJUN	Startpoint: Check with Jet: Not used
SCAC	Working Step: Check movements: Separation cut interrupted
SCAL	Working Step: Check movements: Contour cut interrupted
SCFA	Working Step: Check movements: Absolute end of contour cut

SCFC	Working Step: Check movements: End of separation cut (interrupted)
SCFG	Working Step: Check movements: Physical en of contour
SCFL	Working Step: Check movements: End of contour (interrupted)
SCFS	Working Step: Check movements: Absolute end of separation cut
SCFT	Working Step: Check movements: Physical end of separation cut
SCIC	Working Step: Check movements: Absolute beginning separation cut
SCIG	Working Step: Check movements: Physical beginning of contour cut
SCIL	Working Step: Check movements: Absolute beginning contour cut
SCIT	Working Step: Check movements: Physical beginning of separation cut
SCRC	Working Step: Check movements: Beginning separation cut (resume)
SCRL	Working Step: Check movements: Beginning contour cut (resume)
SCRP	Working Step: Check movements: Point on the contour reached
SCUA	Working Step: Check movements: Wire missing
SCUD	Working Step: Check movements: Electrode disposable
SEAC	Working Step: Erosion: Separation cut interrupted
SEAL	Working Step: Erosion: Contour cut interrupted
SEFA	Working Step: Erosion: Absolute end of contour cut
SEFC	Working Step: Erosion: End of separation cut (interrupted)
SEFG	Working Step: Erosion: Physical end of contour cut
SEFL	Working Step: Erosion: End of contour cut (interrupted)
SEFS	Working Step: Erosion: Absolute end of separation cut
SEFT	Working Step: Erosion: Physical end of separation cut
SEIC	Working Step: Erosion: Absolute beginning separation cut
SEIG	Working Step: Erosion: Physical beginning of contour cut
SEIL	Working Step: Erosion: Absolute beginning contour cut
SEIT	Working Step: Erosion: Physical beginning of separation cut
SERC	Working Step: Erosion: Beginning separation cut (resume)
SERL	Working Step: Erosion: Beginning contour cut (resume)
SEUA	Working Step: Erosion: Wire missing
SEUD	Working Step: Erosion: Electrode disposable
WCAB	Piece: Check movements: Interrupted
WCFA	Piece: Check movements: Absolute end of contour cut
WCFI	Piece: Check movements: End
WCIA	Piece: Check movements: Absolute beginning
WCIN	Piece: Check movements: Beginning
WCLA	Piece: Check movements: Piece missing on pallet
WCLD	Piece: Check movements: Pallet disposable
WCLF	Piece: Check movements: Pieces terminated on pallet
WCMS	Piece: Check movements: Machine stopped
WCPA	Piece: Check movements: Piece missing
WCPD	Piece: Check movements: Piece disposable
WCPO	Piece: Check movements: Behaviour in case of faulty geometric parameters
WCSO	Piece: Check movements: Behaviour in case of faulty startpoint
WCTA	Piece: Check movements: Table missing
WCTD	Piece: Check movements: Table disposable
WCTF	Piece: Check movements: Pieces terminated on table
WEAB	Piece: Erosion: Interrupted
WEBO	Piece: Erosion: Behaviour in case of error in the ISO File
WELA	Piece: Erosion: Pallet missing
WELD	Piece: Erosion: Pallet disposable
WELF	Piece: Erosion: Pieces terminated on pallet

WEPA	Piece: Erosion: Piece missing
WEPD	Piece: Erosion: Piece disposable
WEPO	Piece: Erosion: Behaviour in case of faulty geometric parameters
WESO	Piece: Erosion: Behaviour in case of faulty startpoint
WETA	Piece: Erosion: Table missing
WETD	Piece: Erosion: Table disposable
WETF	Piece: Erosion: Pieces terminated on table

C. Documented Events

10.1.1 AECI

Machining: Erosion: Behaviour at threading

ACTIONS	CODE OF SCRIPT
• **Raise Z to thread**	• **8059**
1. mm [mm]	Acts at Return plane on Startpoint
a) numerical value	0
	"AECI+8059+0;+"

10.1.2 AEFA

Machining: Erosion: Absolute end

ACTIONS	CODE OF SCRIPT
• **Activate Reference**	• **8000**
1. Type of object	
a) Auxiliary Reference	N
b) Table	T
c) Pallet	P
d) Piece	W
e) Group	G
f) Group Machining	R
g) Single Machining	A
2. Name of object	
a) Name	String
3. Group or Machining name	
a) Name	String
4. Machining Name	
a) Name	String
5. Object correction	
a) Enabled (Check Box)	0 = Not enabled; 1 = Enabled
	"AEFA+8000+N;Name;Name;Name;0;+"

• **Centring of a nose**	• **8043**
1. Wire tension [FW]	
a) Numerical value	0
2. With bath	
a) Yes	1
b) No	0
3. Precision	
a) Low	0
b) High	1

4. Displacement with wire	
a) Yes	1
b) No	0
4. Startpoint X [mm]	
a) Numerical value	0
5. Startpoint Y [mm]	
a) Numerical value	0
6. Startpoint Z [mm]	
a) Numerical value	0
7. Startpoint U [mm]	
a) Numerical value	0
8. Startpoint V [mm]	
a) Numerical value	0
10. Cycle Rotation	
a) 0	0
b) 90	1
c) 180	2
d) 270	3
11. Distance X [mm]	
a) Numerical value	10
12. Distance Y [mm]	
a) Numerical value	10
	"AEFA+8043+0;0;0;1;0;0;0;0;0;0;10;10;+"

• **Centring of 2 faces**	• **8045**
1. Wire Tension [FW]	
a) numerical value	0
2 With Bath	
a) Yes	1
b) No	0
3 Precision	
a) Low	0
b) High	1
4. Touch angle	
a) numerical value	0
5. Startpoint X [mm]	
a) Numerical value	0
6. Startpoint Y [mm]	
a) Numerical value	0
7. Startpoint Z [mm]	
a) Numerical value	0
8. Startpoint U [mm]	
a) Numerical value	0
9. Startpoint V [mm]	
a) Numerical value	0
	“AEFA+8045+0;0;0;0;0;0;0;0;0;+”

• **Centring of a hole**	• **8040**
1. Wire Tension [FW]	
a) numerical value	0
2. With Bath	
a) Yes	1
b) No	0
3. Precision	
a) Low	0
b) High	1
4. Startpoint X [mm]	

a) Numerical value	0
5. Startpoint Y [mm]	
a) Numerical value	0
6. Startpoint Z [mm]	
a) Numerical value	0
7. Startpoint U [mm]	
a) Numerical value	0
8. Startpoint V [mm]	
a) Numerical value	0
9. Touch angle	
a) Numerical value	0
	"AEFA+8040+0;0;0;0;0;0;0;0;0;0;+"

• **Disalignment in A/B; Pos.Z**	• **8048**
1. Precision	
a) Low	0
b) High	1
2. Startpoint X [mm]	
a) Numerical value	0
3. Startpoint Y [mm]	
a) Numerical value	0
4. Startpoint Z [mm]	
a) Numerical value	0
5. Startpoint U [mm]	
a) Numerical value	0
6. Startpoint V [mm]	
a) Numerical value	0
7. Distance in X [mm]	
a) Numerical value	10
8. Distance in Y [mm]	
a) Numerical value	10
9. Cycle rotation	
a) 0	0
b) 90	1
c) 180	2
d) 270	3
	"AEFA+8048+0;0;0;0;0;0;10;10;0;+"

• **Disalignment in C**	• **8046**
1. Wire Tension [FW]	
a) numerical value	0
2. With Bath	
a) Yes	1
b) No	0
3. Precision	
a) Low	0
b) High	1
4. Displacement with wire	
a) Yes	1
b) No	0
5. Startpoint X [mm]	
a) Numerical value	0
6. Startpoint Y [mm]	
a) Numerical value	0
7. Startpoint Z [mm]	
a) Numerical value	0
8. Startpoint U [mm]	

a) Numerical value	0
9. Startpoint V [mm]	
a) Numerical value	0
10. Angle of side to be measured	
a) Numerical value	0
11. Cycle rotation	
a) 0	0
b) 90	1
c) 180	2
d) 270	3
12. Distance [mm]	
a) Numerical value	10
	"AEFA+8046+0;0;0;0;0;0;0;0;0;0;0;10;+"

• **Set Puls**	• **8006**
1. Channel ID	
a) Numerical value	0
2. State	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
3. Impulse Length	
a) Numerical value	0
	"AEFA+8006+0;0;0;+"

• **Set Level**	• **8012**
1. Type of Bath level	
a) below piece	0
b) above piece	1
c) thermostabilized	2
d) drain	3
e) set	4
2. Level Height [mm]	
a) Numerical value	0
	"AEFA+8012+0;0;+"

• **Move to**	• **8010**
1. X [mm]	
a) Numerical value	0
2. Y [mm]	
a) Numerical value	0
3. Z [mm]	
a) Numerical value	0
4. U [mm]	
a) Numerical value	0
5. V [mm]	
a) Numerical value	0
6. Speed [mm]	
a) Numerical value	0
7. Incremental / Absolute	
a) Incremental	0
b) Absolute	1
8. Reference / Machine 0	
a) Reference	0
b) machine 0	1
	"AEFA+8010+0;0;0;0;0;0;0;0;+"

• **Move Worktank**	• **8013**
1. Worktank door	

a) Lift	0
b) Lower	1
	"AEFA"+8013+0;+"

• **Offset 2 AGIEPILOT**	• **8052**
1. Wire Tension (Fw)	
a) Numerical value	17
2. Wire Speed	
a) Numerical value	90
3. With Bath	
a) Yes	1
b) No	0
4. Startpoint X [mm]	
a) Numerical value	0
5. Startpoint Y [mm]	
a) Numerical value	0
6. Startpoint Z [mm]	
a) Numerical value	0
7. Startpoint U [mm]	
a) Numerical value	0
8. Startpoint V [mm]	
a) Numerical value	0
	"AEFA+8052+17;90;0;0;0;0;0;0;+"

• **Reset Bit**	• **8003**
1. From Channel ID	
a) Numerical value	0
2. To Channel ID	
a) Numerical value	0
	"AEFA+8003+0;0;+"

• **Rotation/Centring of 2 holes**	• **8051**
1. Wire Tension (Fw)	
a) Numerical value	0
2. With Bath	
a) Yes	1
b) No	0
3. Precision	
a) Low	0
b) High	1
4. Correction X/Y	
a) First hole Centre	0
b) Centring of 2 holes	1
c) Second hole centre	2
5. Side to be measure	
a) X	0
b) Y	1
6. Distance X [mm]	
a) Numerical value	10
7. Distance Y [mm]	
a) Numerical value	10
8. Startpoint X [mm]	
a) Numerical value	0
9. Startpoint Y [mm]	
a) Numerical value	0
10. Startpoint Z [mm]	
a) Numerical value	0

11. Startpoint U [mm]	
a) Numerical value	0
12. Startpoint V [mm]	
a) Numerical value	0
	“AEFA+8051+0;0;0;0;0;10;10;0;0;0;0;0;+”

• **Set Bit**	• **8004**
1. Channel ID	
a) Numerical value	0
2. State	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
	“AEFA+8004+0;0;+”

• **Set Port**	• **8005**
1. Port ID	
a) Numerical value	0
2. Mask	
a) Numerical value	0
	“AEFA+8005+0;0;+”

• **X/Y Edge**	• **8047**
1. Wire Tension (Fw)	
a) Numerical value	0
2. With Bath	
a) Yes	1
b) No	0
3. Precision	
a) Low	0
b) High	1
4. Displacement with the wire	
a) Yes	1
b) No	0
5. Startpoint X [mm]	
a) Numerical value	0
6. Startpoint Y [mm]	
a) Numerical value	0
7. Startpoint Z [mm]	
a) Numerical value	0
8. Startpoint U [mm]	
a) Numerical value	0
9. Startpoint V [mm]	
a) Numerical value	0
10. Distance in X [mm]	
a) Numerical value	10
11. Distance in Y [mm]	
a) Numerical value	10
12. Cycle rotation	
a) 0	0
b) 90	1
c) 180	2
d) 270	3
	“AEFA+8047+0;0;0;1;0;0;0;0;0;10;10;0;+”

• **Stop**	• **8014**
	“AEFA+8014+;+”

• **Wire Shear**	• **8011**

	"AEFA+8011+;+"

• **Chuck cover**	• **8053**
1. Position of the Chuck cover	
a) Numerical value	1
	"AEFA+8053+1;+"

• **Touch in X/Y**	• **8044**
1. Wire Tension (Fw)	
a) Numerical value	0
2. With Bath	
a) Yes	1
b) No	0
3. Precision	
a) Low	0
b) High	1
4. Cycle rotation	
a) 0	0
b) 90	1
c) 180	2
d) 270	3
5. Startpoint X [mm]	
a) Numerical value	0
6. Startpoint Y [mm]	
a) Numerical value	0
7. Startpoint Z [mm]	
a) Numerical value	0
8. Startpoint U [mm]	
a) Numerical value	0
9. Startpoint V [mm]	
a) Numerical value	0
	"AEFA+8044+0;0;0;0;0;0;0;0;0;+"

• **Touch in Z**	• **8042**
1. Precision	
a) Low	0
b) High	1
2. Startpoint X [mm]	
a) Numerical value	0
3. Startpoint Y [mm]	
a) Numerical value	0
4. Startpoint Z [mm]	
a) Numerical value	0
5. Startpoint U [mm]	
a) Numerical value	0
6. Startpoint V [mm]	
a) Numerical value	0
	"AEFA+8042+0;0;0;0;0;0;+"

• **Move to Re.Pl.**	• **8009**
	"AEFA+8009+;+"

• **Move to Sic.Pl.**	• **8008**
	"AEFA+8008+;+"

• **Wait Bit**	• **8001**

1. Channel ID	
a) Numerical value	0
2. State	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
3. TimeOutOn	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
4. Time-out	
a) Numerical value	0
	"AEFA+8001+0;0;0;0;+"

• **Wait port**	• **8002**
1. ID Port	
a) Numerical value	0
2. Mask	
a) Numerical value	0
3. TimeOutOn	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
4. Time-out	
a) Numerical value	0
	"AEFA+8002+0;0;0;0;+"

10.1.3 AEFI

Machining: Erosion: End

ACTIONS (See AEFA)

10.1.4 AEIA

Machining: Erosion: Absolute Beginning

ACTIONS (See AEFA)

10.1.5 AEIN

Machining: Erosion: Beginning

ACTIONS (See AEFA)

10.1.6 AENI

Machining: Erosion: Cannot thread

ACTIONS	CODE OF SCRIPT
• **Skip**	• **8016**
1. Number of threadings	
a) Numerical value	0
	"AENI+8016+0;+"

• **Stop**	• **8015**
1. Number of threadings	
a) Numerical value	0
	"AENI+8015+0;+"

10.1.7 AEPC

Machining: Erosion: Start in short circuit

ACTIONS	CODE OF SCRIPT
• **Continue**	• **8057**
1. Waiting period	
a) Numerical value	60
	"AEPC+8057+60;+"

• **Stop**	• **8058**
1. Waiting period	
a) Numerical value	60
	"AEPC+8058+60;+"

10.1.8 AERF

Machining: Erosion: Wire break

ACTIONS	CODE OF SCRIPT
• **Thread on the Spot**	• **8030**
	"AERF+8030+;+"

• **Continue after n breaks**	• **8031**
1. Max. number local wire breaks	
a) Numerical value	4
2. Area of local wire breaks [mm]	
a) Numerical value	0
3. Max. number of wire breaks	
a) Numerical value	9
	"AERF+8031+4;0;9;+"

• **Retry**	• **8033**
	"AERF+8033+;+"

• **Stop after n wire breaks**	• **8032**
1. Max. number local wire breaks	
a) Numerical value	4
2. Area of local wire breaks [mm]	
a) Numerical value	0
3. Max. number of wire breaks	
a) Numerical value	9
	"AERF+8032+4;0;9;+"

• **Stop**	• **8018**
	"AERF+8018+;+"

10.1.9 AERO

Machining: Erosion: Behaviour when radius smaller than offset

ACTIONS	CODE OF SCRIPT
• **With undercuts**	• **8056**
	"AERO+8056+;+"

• **With undercuts on offset and conic**	• **8086**
	"AERO+8086+;+"

• **Without undercuts**	• **8060**
	"AERO+8060+;+"

10.1.10 AERP

Machining: Erosion: Technology for return to cut

ACTIONS	CODE OF SCRIPT
• **of Re-entry**	• **8025**
	"AERP+8025+;+"

• **Programmed**	• **8025**
	"AERP+8026+;+"

• **Without Current**	• **8024**
	"AERP+8024+;+"

10.1.11 AERR

Machining: Erosion: Technology after return

ACTIONS	CODE OF SCRIPT
• **Programmed**	• **8027**
	"AERR+8027+;+"

• **Reduced**	• **8028**
1. Reduction of parameter P	
a) Numerical value	6
2. Increase of parameter td	
a) Numerical value	30
3. Increase of parameter ISH	
a) Numerical value	0
4. Path length at reduced technological parameters [mm]	
a) Numerical value	0
	"AERR+8028+6;30;0;0;+"

10.1.12 AERS

Machining: Erosion: Type of return to startpoint

ACTIONS	CODE OF SCRIPT
• **Returning on the contour**	• **8036**
	"AERS+8036+;+"

• **By the shortest Way**	• **8034**
	"AERS+8034+;+"

10.1.13 AESF

Machining: Erosion: Drop-out part to be fixed

ACTIONS	CODE OF SCRIPT
• **AutoFix**	• **8019**
1. Distance to be left [mm]	
a) Numerical value	0.38
	"AESF+8019+0.38;+"

• **Drop**	• **8020**
1. Distance from separation cut [mm]	
a) Numerical value	0
2. Maximum length in short circuit [mm]	
a) Numerical value	0
	"AESF+8020+0;0;+"

• **Stop**	• **8018**
	"AESF+8018+;+"

• **Chuck cover**	• **8053**
1. Position of the Chuck cover	
a) Numerical value	1
	"AESF+8053+1;+"

10.1.14 AESR

Machining: Erosion: Drop-out part to be removed

ACTIONS	CODE OF SCRIPT
• **Stop**	• **8018**
	"AESR+8018+;+"

• **Chuck cover**	• **8053**
1. Position of the Chuck cover	
a) Numerical value	1
	"AESR+8053+1;+"

10.1.15 GEFA DESCRIPTION

Group: Erosion: Absolute end

ACTIONS (See AEFA)

10.1.16 GEFI

Group: Erosion: End

ACTIONS (See AEFA)

10.1.17 GEIA

Group: Erosion: Absolute beginning

ACTIONS (See AEFA)

10.1.18 GEIN

Group: Erosion: Beginning

ACTIONS (See AEFA)

10.1.19 WEFA

Piece: Erosion: Absolute end

ACTIONS	CODE OF SCRIPT
• **Export Data (new)**	• **8084**
1. Info on execution process	
a) enabled	0
b) not enabled	1
2. Number of considered hours	
a) Numeric value	Integer (100 default)
3. Filename progress information	
a) Name	String (BDE or MSG) (8 char max)
4. Real Times	
a) enabled	0
b) not enabled	1
5. Real Times Filename	
a) Name	String (BDE or TIME) (8 char max)
6. Path	
a) Name	String
7. Overwriting	
a) enabled	0
b) not enabled	1
	"WEFA+8084+1;100;bdename;1;timename;X:\;0;+"

10.1.20 WEFI

Piece: Erosion: End

ACTIONS (See AEFA)

10.1.21 WEIA

Piece: Erosion: Absolute beginning

ACTIONS (See AEFA)

10.1.22 WEIN

Piece: Erosion: Beginning

ACTIONS (See AEFA)

10.1.23 WEMS

Piece: Erosion: Machine stopped

ACTIONS	CODE OF SCRIPT
• **Set Puls**	• **8006**
1. Channel ID	
a) Numerical value	0
2. State	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
3. Impulse Length	
a) Numerical value	0
	"WEMS+8006+0;0;0;+"

• **Reset Bit**	• **8003**
1. From Channel ID	
a) Numerical value	0
2. To Channel ID	
a) Numerical value	0
	"WEMS+8003+0;0;+"

• **Set Bit**	• **8004**
1. Channel ID	
a) Numerical value	0
2. State	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
	"WEMS+8004+0;0;+"

• **Set Port**	• **8005**
1. ID Port	
a) Numerical value	0
2. Mask	
a) Numerical value	0 = Not Enabled; 1 = Enabled
	"WEMS+8005+0;0;+"

• **Wait Bit**	• **8001**
1. Channel ID	
a) Numerical value	0
2. State	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
3. TimeOutOn	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
4. Time-out	
a) Numerical value	0
	"WEMS+8001+0;0;0;0;+"

• **Wait port**	• **8002**
1. Port ID	
a) Numerical value	0
2. Maschera	
a) Numerical value	0
3. TimeOutOn	
a) Enabled (Check Box)	0 = Not Enabled; 1 = Enabled
4. Time-out	
a) Numerical value	0
	"WEMS+8002+0;0;0;0;+"

10.1.24 SERPxx (xx replaces name of point)

Cut: Erosion: Point on the contour reached

ACTIONS	CODE OF SCRIPT
• **Set Puls**	• **8006**
1. Channel ID	
a) Numerical value	0
2. State	
a) Enabled (Check Box)	0 = Not Enabled; 1: Enabled
3. Impulse Length	
a) Numerical value	0
	"SERPxx+8006+0;0;0;+"

• **Set Technology**	• **8007**
1. Item selection: Choose cut	
a) Trimcut Name	String
	"SERPxx+8007+Trimcut Name;+"

• **Reset Bit**	• **8003**
1. From Channel ID	
a) Numerical value	0
2. To Channel ID	
a) Numerical value	0
	"SERPxx+8003+0;0;+"

• **Set Bit**	• **8004**
1. Channel ID	
a) Numerical value	0
2. State	
a) Enabled (Check Box)	0 = Not Enabled; 1: Enabled
	"SERPxx+8004+0;0;+"

• **Set Port**	• **8005**
1. ID Port	
a) Numerical value	0
2. Mask	
a) Numerical value	0
	"SERPxx+8005+0;0;+"

• **Stop**	• **8014**
	"SERPxx+8014+;+"

11 Addendum B

11.1 Limits of SBL

11.1.1 Number of lines in SUB

The maximum number of lines accepted in a Sub (like Sub Main) is 600 lines. If this number of lines is exceeded, an error message is displayed on AGIEVISION during execution of SBL-File with CAM-LINK. To overcome this problem, divide the large sub in smaller subs, like this:

```
Sub part1
ok=JE_.....
ok=JE_.....
....
End Sub
Sub Part2
ok=JE_...
ok=JE_...
...
End Sub
Sub Main
ok=JE_...
ok=JE_...
part1
part2
....
end Sub
```

11.1.2 Constant Space

There is a precise amount of Constant Space reserved in SBL. It is calculated in bytes.

As it is very difficult to tell when this amount is used up, we suggest not to place more than 100 machinings into a single SBL-file. This means that a Workpiece holding more than 100 machinings has to be divided into two or more Workpieces. This is not a big problem, as now there is a simple method to merge back all those SBL-files into a single Workpiece. The method is described in the document **C12.14 Description of input formats for COMSCRIPT** with the command **LP_Open(...).**

The interesting thing is that the normal SBL-files haven't to be changed to permit later merging.

11.1.3 Allowed characters for SUB-names

The only characters that are allowed for sub names are the alphanumeric characters made out of letters and numbers.

11.1.4 Usertechnology names

New with 04.XX: The length of the user technology name cannot be longer than 14 characters.

12 Addendum C

(valid from Agiecut Vertex 05.02.xx)

12.1 Introduction

In this document we want to explain the new attributes and functions valid only for this new type of AGIECUT, the VERTEX. All the attributes and functions valid for the previous versions of AGIEVISION are correctly read by the VERTEX, but not all of them have the same meaning or a meaning at all. Where possible, the VERTEX tries to interpret the older attribute by adapting it to the new situation, otherwise it is simply ignored and a default value is set. It's also possible, that an invalid data for the VERTEX is chosen, in this case an error message should appear on AGIEVISION informing you that there is no such value. You must then operate the modification manually directly on the VERTEX or change the value in the SBL-Script. Generally, this makes it possible to continue to use SBL-Scripts and geometries of all previous versions.

There are some new attributes belonging to the different objects, but the most important modifications or additions belong to the technology. This is due to the new generator IPG, which is very different from the previous ones.

Attributes and functions not mentioned in this document are still valid and can be found in the previous C12.04 Document for version 03.04.03.

12.2 Quality association

12.2.1 New Concept

The concept of Quality association has changed significantly. Before, you could define a needed quality target and AGIEVISION searched inside his database a technology file which matched exactly or got very close to the quality target. When there was no exact match you could force with SBL (**JE_GenerateAttrib**(c_tecass, [c_tecass_nauto | c_tecass_fi]) to take the first nearest technology of the database or make appear the 13 technologies from where to choose manually.

The **new concept** will create the technology files **at runtime** by means of ranges of possible values chosen by the quality target. Every value contained in the range will generate a technology, matching exactly the expected quality. If the value falls outside the range, then a closest match to the expected value is chosen. The chance to find an exact match has therefore increased significantly.

On the other hand, the commands **JE_GenerateAttrib**(c_tecassign,…) and **JE_GenerateAttrib**(c_tecalert, …) have become meaningless. The only differentiation you can have now is:

automatic association of the technology : **YES**
automatic association of the technology : **NO**

This is still done with **JE_GenerateAttrib**(c_tecauto, [c_tecauto_t | c_tecauto_f])

If **YES** is chosen, the in any case a technology will be created automatically, but the outcoming quality should be checked by the user for correct correspondence.

12.2.2 JE_CreateQuality

The previous ParamList of the function **JE_CreateQuality** was:

"Ra, Te, Tkm, High Speed, Surface Quality, unused"

With the new IPG, Te, High Speed and Surface Quality have disappeared. Te is substituted by Tf. Nevertheless the parameters Tkm, Te, High Speed and Surface quality maintain their position, for compatibility reason. If you enter the previous ParamList into the SBL for the VERTEX, it will try to create Tf from Tkm and Te.

E.g. a Tkm of 4, Te of 2, will give a **Tf** of 8.5

New ParamList is now:

"Ra, Te, Tkm, High Speed, Surface Quality, **Tf, F, F, F,F,F**"

The last five parameters are still unused. To summarize, at the moment only two values in the ParamList are significant for the definition of the Quality target:

Ra and **Tf** or **Ra** and **Tkm**, depending if **Tkm** or **Tf** is configured on the AGIEVISION by the User.

This is the list of the available Ra values:

Ra in µm
0.01 SF - 0.15 SF Step of 0.01
0.17 SF
0.20 OPT
0.25 OPT
0.30 - 1.00 Step of 0.05
1.10
1.20

Ra in µm
1.50
1.80
2.00
2.30
2.50
3.00
5.00

The list of available **Tf** values are:

Tf in µm
0.5 - 10 Steps of 0.5
11.0 - 20.0 Steps of 1.0
25.0 - 100.0 Steps of 5.0
0.25 OPT
0.30 - 1.00 Step of 0.05

The list of available **Tkm** are:

Tkm in µm
1.50
1.80
2.00
2.30
2.50
3.00
5.00

12.2.3 User Tec association and c_tecfromtecno

The quality target can also be associated, as before, by using a USER technology, instead of an AGIEDB working step. This is done with the sentence:

ok=JE_GenerateCuts(WORK,je_piece,je_grp,"work2",ASUSER,"user1")

Why do we mention something which hasn't been changed?

Well, you surely know, that a User Technology is a set of parameters defined by the operator, which is stored with a name on the AGIEVISION. Also the wire type is already defined. Now, what happens, if inside the WORK you define another wire type? By default, the wire type in the User Technology has priority over the WORK definition. This default can be overridden by SBL with a special command:

ok=JE_GenerateAttrib(**c_tecfromtecno**,"**0**")

After this, the wire defined in the WORK by your SBL has priority over the user technology. This command is **modal**. To reset to the default situation enter the command:

ok=JE_GenerateAttrib(**c_tecfromtecno**,"**1**")

This command is valid only for User Technology and **not for AGIEDB**. If a wire change is defined for a **working step**, then this command has no influence. This means that in any case the wire defined in the SBL has priority.

WARNING! WARNING! WARNING! WARNING! WARNING!

A wire change can already be present in a correctly tested Usertechnology. Overwriting such a technology can have several consequences, because AGIEVISION will **not adapt any parameter** to the forced wire type from the SBL. So be careful letting use this function

12.3 Two wires in one workpiece

With AGIECUT VERTEX a machine Family has been developed adding a very useful and interesting capability to the AGIEVISION machine stock: Automatic change of wire type during erosion. This enhancement has positive effects on **erosion time reduction**.

From the geometrical point of view using two wires with different radii in the same geometry, can have important **side effects**: In some situation the bigger wire won't enter small slits, when the second smaller wire will indeed enter. This can generate dangerous drop-out pieces which can block and **damage** the machine. For the moment AGIECUT VERTEX has **not** implemented an algorithm to avoid such drop-out pieces from falling down. For a CAM-System this functionality could be implemented in two ways:

- Warning message that a drop-out piece will be generated, showing the exact places where this will happen.
- Modifying the geometries in a way to avoid the problem.

12.3.1 How to define a wire change for one or more machinings

To change the wire from one machining to the next is very simple. Just define for the object **WORK** the desired wire with **ID_THREAD** and the job is done. If used in conjunction with a **User technology**, you must first decide if the wire given in the **WORK** has **priority** or not over the wire defined in the User technology. See previous point 2.3.

12.3.2 How to define a wire change for one or more Working steps

The object for the Working step is **ASCH**, as you know already. The sentence must be written **after** the **JE_GenerateCuts** of the implied **WORK**. Each working step where the wire change is valid must be explicitly written in the SBL. Each working step has a number, starting at **1** for the **main cut**.

WARNING! WARNING! WARNING! WARNING! WARNING!

A wire change can already be present in an **AGIEDB**. Overwriting such a technology can have several consequences, because AGIEVISION will **not adapt any parameter** to the forced wire type from the SBL. So be careful letting use this function. Eventually you must supply the needed technological parameter adaptation from SBL. See chapter 7.

12.4 New SCRIPT Attributes

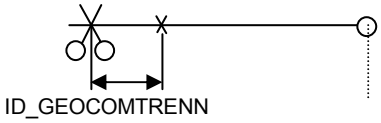
Only a few new attributes are introduced in AGIECUT VERTEX. This attributes are called by

JE_AttribObject(**byval SortOfObject as long,**
byval GetSet as long,
byval PieceName as string,
byval GroupName as string,
byval WorkName as string,
byval Name as string,
byval id as long,
byval strid as string,
byval dimstr as long)

WORK attributes

New id: ID_GEOCOMTRENN

Purpose: This value is a distance in mm with **default 999.9999mm**. It's the anticipation distance from the wire cut point in a separation cut, where the technology is changed from main to the exit.



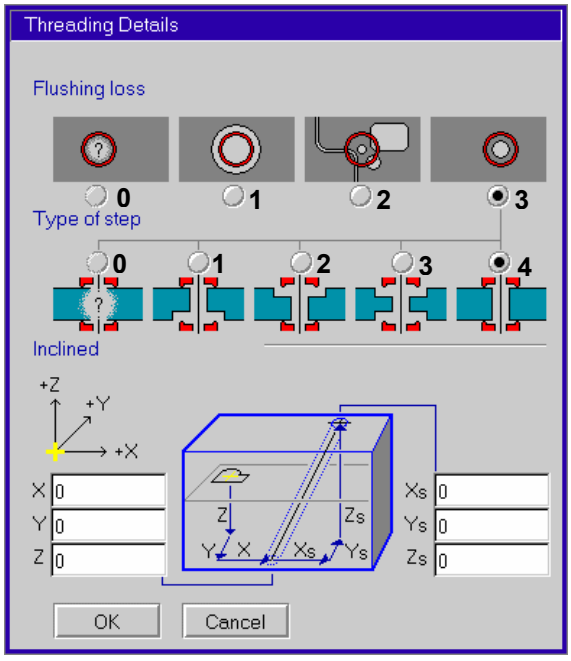
ID_GEOCOMTRENN

STARTPOINT attributes

New: **ID_STP_PL**

Purpose: Flushing loss (see picture)

Possible values for strid: "0","1","2","3"



ID_STP_PL

ID_STP_TS

New: ID_STP_TS

Purpose: Type of step (see picture):

Possible values for strid: "0","1","2","3","4".

As seen on the picture, this parameter is onl available for a flushing loss set to "3".

ID_POSZ, ID_HEIGHT, ID_POSPOSZ

ATTENTION! This is not a change of attributes, but a VERY IMPORTANT information on it's new application.

For cylindrical workpieces, the positions and heights where not so important, because the wire was perpendicular and the geometry valid for every position in Z. Now an algorithm has been developed to fine-tune the verticality of the workpiece. For this reason, it is now decisive where the effective position of the WORK is defined in relation to the real material.

12.5 New Wires

To define a wire the usual attribute **ID_THREAD** is called. The only difference to previous versions is that the wire can be defined also for object **WORK** and **ASCH**. See Chapter 3 for more explanations.

the complete table of wires now is:

Wire Type
Cobra Cut A 0.10
Cobra Cut A 0.15
Cobra Cut A 0.20
Cobra Cut A 0.25
Cobra Cut A 0.30
Cobra Cut D 0.25
Cobra Cut W 0.25
Cobra Cut S 0.30
Cobra Cut S 0.33
Tungsteno 0.03
Tungsteno 0.05
TWS-20
TWS-30
TWS-50
SP Wire 0.05
SP Wire 0.07
Berco Cut 0.15
Berco Cut 0.20
Berco Cut 0.25
Berco Cut 0.30
Berco Cut 0.10
SW20 A_TC
SW15 A_TC
SW10 A_TC
Brass20_TC
Brass15_TC
Brass10_TC
Cobra Cut G 0.20
Cobra Cut G 0.15

Remember to write the wire name exactly as it is written in above table with upper/lower case sensitivity!

12.6 New (modified) Events/Actions

12.6.1 New Parameters

AERR - Machining: Erosion: Technology after Resume point.

in Action **Reduced** a new parameter is **ADDED**.

ACTIONS	**CODE OF SCRIPT**
♦ Programmed	♦ 8027
	"AERR+8027+;+"
♦ Reduced	♦ 8028
1. Reduction of parameter P	**Default / Minimum / Maximum**
a) numerical value	6 / 0 / 30
2. Increase of parameter Ssoll	
a) numerical value	0 / 0 / 50
3. Increase of parameter ISH	
a) numerical value	1 / 0 / 7
4. Path length at reduced technological parameters (mm)	
a) numerical value	0
Example string of strid	"AERR+8028+6;30;1;0;+"

WEIA - Piece: Erosion: Absolute beginning.
AEIA - Machining: Erosion: Absolute beginning.

A **new parameter** is added to the Action **Rotation/centering of 2 holes**.

ACTION	**CODE OF SCRIPT**
♦ Rotation/Centering of 2 holes	♦ **8051**
1. Wire Tension (Fw)	
a) Numerical value	0
2. With Bath	
a) Yes	1
b) No	0
3. Precision	
a) 1µm	0
b) 2µm	1
c) 3µm	2
d) 4µm	3
e) 5µm	4
f) 7µm	5
g) 10µm	6
h) 15	7
i) 20µm	8
j) 1µm pin touch	9
4. Wire cut	
a) Only at cycle end	1
b) Never	3
5. Correction X/Y	
a) First hole Centre	0
b) Centring of 2 holes	1
c) Second hole centre	2
6. Side to be measure	
a) X	0
b) Y	1
7. Distance X [mm]	
a) Numerical value	10
8. Distance Y [mm]	
a) Numerical value	10
9. Startpoint X [mm]	
a) Numerical value	0
10. Startpoint Y [mm]	
a) Numerical value	0
11. Startpoint Z [mm]	
a) Numerical value	0
12. Startpoint U [mm]	
a) Numerical value	0
13. Startpoint V [mm]	
a) Numerical value	0
	"AEIA+8051+0;0;6;3;0;0;10;10;0;0;0;0;0;+"

AERF - Machining: Erosion: Wire break. **New parameter**s in Action Continue after n breaks:

ACTIONS	CODE OF SCRIPT
Continue after n breaks	**8031**
1. Max. number local wire breaks	
a) Numerical value	4
2. Area of local wire breaks [mm]	
a) Numerical value	0
3. Max. number of wire breaks	
a) Numerical value	9
4. Wire management	
a) without Ejection	0
b) with Ejection	1
5. X (mm)	
a) numerical value	0
6. Y (mm)	
a) numerical value	0
7. Z (mm)	
a) numerical value	0
8. U (mm)	
a) numerical value	0
9. V (mm)	
a) numerical value	0
10. Incremental/absolute	
a) Incremental	0
b) absolute	1
	"AERF+8031+4;0;9;0;0;0;0;0;0;0;+"

AERF: Machining: Erosion: Wire break: **New Parameters** in Action Retry:

ACTIONS	CODE OF SCRIPT
Retry	**8033**
1. Wire management	
a) without Ejection	0
b) with Ejection	1
2. X (mm)	
a) numerical value	0
3. Y (mm)	
a) numerical value	0
4. Z (mm)	
a) numerical value	0
5. U (mm)	
a) numerical value	0
6. V (mm)	
a) numerical value	0
7. Incremental/absolute	
a) Incremental	0
b) absolute	1
	"AERF+8033+0;0;0;0;0;0;0;+"

AERF: **New parameters** in Action Stop after n wire breaks:

ACTIONS	CODE OF SCRIPT
Stops after n breaks	**8032**
1. Max. number local wire breaks	
a) Numerical value	4
2. Area of local wire breaks [mm]	
a) Numerical value	0
3. Max. number of wire breaks	
a) Numerical value	9
4. Wire management	
a) without Ejection	0
b) with Ejection	1
5. X (mm)	
a) numerical value	0
6. Y (mm)	
a) numerical value	0
7. Z (mm)	
a) numerical value	0
8. U (mm)	
a) numerical value	0
9. V (mm)	
a) numerical value	0
10. Incremental/absolute	
a) Incremental	0
b) absolute	1
	“AERF+8032+4;0;9;0;0;0;0;0;0;+”

12.6.2 New Actions

AEFA - AEIA - SEFA - SEFS - SEIC - SEIL: A **new** Action is **ADDED**:

Discard Wire.

ACTIONS	CODE OF SCRIPT
♦ Discard Wire	♦ **8090**
	"AEFA+8090+;+"

SEUD - Working Step: Erosion: Wire available. A **new** Action is ADDED:

Spool change

ACTIONS	CODE OF SCRIPT
♦ Spool change	♦ **8087**
	"AEFA+8087+;+"

AECI - AICI Behaviour of threading. **New** Actions added.

ACTIONS	CODE OF SCRIPT
♦ Raise Z to thread	♦ **8088**
1. mm (mm)	
a) numerical value	0
2. Flushing loss by cutting slot	
a) Startpoint data	0
b) Total	1
c) Partial	2
d) None	3
3. Type of stepped piece with cutting slut	
a) Startpoint Data	0
b) plane-parallel	1
c) Stepped on top	2
d) stepped on bottom	3
e) stepped on top/bottom	4
4. Flushing loss on die through lacking or removed drop-out part	
a) Startpoint Data	0
b) Total	1
c) partial	2
d) None	3
5. Type of step on die with lacking or removed drop-out part	
a) Startpoint Data	0
b) plane-parallel	1
c) stepped on top	2
d) stepped on bottom	3
e) stepped on top/bottom	4
	"AECI+8088+0;0;0;0;0;+"

WEIA - Piece: Erosion: Absolute beginning.
AEIA - Machining: Erosion: Absolute beginning. New Action ADDED: Centering of 3 points:

ACTION	**CODE OF SCRIPT**
♦ Centering of 3 points	♦ 8083
1. Wire Tension (Fw)	
a) Numerical value	0
2. With Bath	
a) Yes	1
b) No	0
3. Precision	
a) 1µm	0
b) 2µm	1
c) 3µm	2
d) 4µm	3
e) 5µm	4
f) 7µm	5
g) 10µm	6
h) 15	7
i) 20µm	8
j) 1µm pin touch	9
4. Wire cut	
a) on movements and cycle end	0
b) Only on cycle endr	1
c) only on movements	2
d) never	3
5. Startpoint X [mm]	
a) Numerical value	0
6. Startpoint Y [mm]	
a) Numerical value	0
7. Startpoint Z [mm]	
a) Numerical value	0
8. Startpoint U [mm]	
a) Numerical value	0
9. Startpoint V [mm]	
a) Numerical value	0
10. Initial angle	
a) Numerical value	0 - 360 degrees
11. Measured Sector	
a) numerical value	0 - 360 degrees
12. Distance (mm)	
a) numerical value	0
	"WEIA+8083+0;0;6;3;0;0;0;0;0;0;0;0;+"

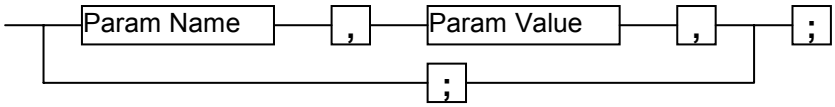
12.7 Technology Parameters Tables

12.7.1 Modify Technological parameters

With the attribute **ID_TEC**, as before, it is possible to change the parameters of the selected technology after import and execution of the SBL file on the AGIEVISION. This technology could be a **user** technology or also a **AGIEDB** technology. In either case the values are just modified temporarily for the ongoing erosion: Re-editing the workpiece and re-associating the technology will also reset the changes.

The values given here must be taken carefully, as there is a very deep and complicated interaction between the several parameters. Setting a parameter to a value, will affect the possible values of other parameters. It is practically impossible to explain the rules on how these parameters will affect each other. All modifications of technology parameters must be done by users knowing exactly what they are doing, otherwise unexpected results and damages to the workpiece could be the cause.

strid for Tec-modifications in JE_AttribObject(..) after **ID_TEC** is:



Example: ok=JE_AttribObject(ASCH, SETATTR, je_piece, je_grp, "work1", "1", **ID_TEC**, "Ofsg,2030,;",je_dim)

It follows a list of modifiable technological parameters and how their Param Code and Param Value is defined.

Param Code	Description	Min.value	Max. value	Step
Module	HW module used	0	255	1
I	Max. amplitude of Impulse	0	255	1
ISH	Diff. between impulse of erosion and short	0	7	1
P	Frequency and shape of impulse	0	87	1
SPL	max. consecutive shorts	0	31	1
Ppos	Number of positive impulses	0	15	1
Pneg	Number of negative impulses	0	15	1
TON	Impulse width for trim cuts	0	32	1
REG	type of regulation	0	139	1
SMode	Servo Mode	0	99	1
SSoll	Servo Soll-Value	8	95	1
STR	Corner strategy/entry/exit	0	99	1
Ofsg	Offset for geometry (unit: 0.1µm)	0	65535	1
WIRF	Wire tension Fw (unit: 0.01N)	0	3000	1
ACC	security level	0	3	tab1
ACO	adaptive control	0	255	tab1
FB	bath	0	2	tab3
FT	flushing type	0	7	tab2
FLP	upper flushing pressure unit: 0.1bar (Soll)	1	200	tab4

Tab. 1 :
ACO = 0: bit0(U) not set: Variocut: No
ACO = 1: bit0(U) set : Variocut: yes
ACC = 0: no adaptive control set
ACC = 1: bit0(W) set: Schleppfehler (conical): Yes
ACC = 2: bit1(C) set: Dynamic Corner Control: Yes
ACC = 3: Schleppfehler and dyn. corner control: Yes

Tab 2 :

Q0	no Flushing
Q11	upper flusing: direct Lower flushing: tap
Q12	upper flushing: tap Lower flushing: direct
Q13	upper flushing: direct Lower flushing: direct
Q14	upper flushing: direct Lower flushing: sucking up
Q15	startron
Q16	upper flushing: tap Lower flushing: tap
Q17	Wire thread jet

tab. 3 :

FB:

0	No bath
1	with bath, wire threading without bath, circulation
2	with bath, wire threading with bath, circulation

tab. 4:

FLP:

5	2	2.5	3	4	5	6	…	19	20
5	20	25	30	40	50	60	…	190	200