STANDARD DESCRIPTION FOR STEEL STRUCTURE PIECES FOR THE NUMERICAL CONTROLS

Recommendations of the DSTV commission

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(7. St Edition)

This Version delete and replace all the previous ones.

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Standard description for steel structure pieces for the numerical controls.

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News of the 7th Corrected Edition

- This page, gives the list of the news of the 7th Edition

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- Annulment of the limitation of 8 Characters for the filenames (Page 4)

   Because the used Operating Systems allows to use longer filenames , the old limitation has no reason to stay.

- Handling of Comments (Page 5, Table of the Blocs Codes)

   The Comments must be taken in account by the programs for in case where, the Interface is exported again. They must be placed in the same place with the same form in the new interface, they cannot be lost. Some new Comments can be introduced.

- Code for left threaded (Page 10)

   The List of Codes for Complete Holes, Threaded, Marking as. Punch or Countersink has been elongated with the Code **I** for the left threaded.

- Adjustment for External and Internal Contours (Page 13)

   All Contours must be closed, it means that the coordinates X and Y of the first and the last points of the Contour must be the same. All other Points of the Contour must be present only once.

- **Bloc Plane Definition** (Page 16 ff.)

   In the **Bloc Profil** the user can define its own Profile Sections, but without the possibility to describe the Geometries as Holes, Internal Contours or Marking of number in all the faces of these profiles. This Problem also appears for the Standard Profile type as Round and Rounded Tube (pipes).

   The **Bloc Plane Definition** brings now the solution.

General Comments

Handling for alternative Descriptions possibilities of Geometries

When for one Geometrie more than one Interpretation of the Interface exists, **It MUST** be taken into account the Interpretation with the lower priority, it means for example that:

- one Hole, which can be described by the Bloc **BO** , can only be described by this Bloc. The use of the Bloc **IK** (Internal Contour) is in this case totally forbidden.

- The use of the Bloc **AK** has higher priority that the Bloc **SC**.

About Theme Skew Cuts and Bloc External Contour

Contrarily to the previous version the Interface asks that the Skew Cuts must be described in the header data, also when the modifications of the External Contours needs other types of the Bloc **AK**. Other Contour Elements have the value 0.0 at this place in the header data.

Foreword

It is a standard interface for the geometrical description of the steel structure pieces for the post-processors with numerical control:

    Saw
    Drill
    Flame Cutting
    Puncher
    …

The essential aim of this interface is to be neutral, it means that with only one standard description we can manage several different NC machines.

The interface standardizes the link between a CAD-program or a graphical system, via a CAM-file for the NC machines.

The geometry of the piece is introduced completely neutraly and after knowing the parameters of the NC machine the post-processor can translate this neutral language to the NC machine language.

The external contour of a beam can be given either by the Code bloc SC (cut) or by the Code bloc AK (external contours of the flanges and the web) but to eliminate any contradictions we recommand to use only one of these two blocs.

At the beginning of this interface, we start with the tradionnal way which describes the external contours.
The Bloc **SC** was created for the description of special 3D cuts which cannot be described by the description of external contours because for example several and different welding preparation can be located on one edge of the piece.

Recommendation for futur users of the DSTV

The factories which are buying a new NC machine should attach this DSTV description to their order form and so protect themself from any surprises.

Generalities

This interface describes the link between the CAD and graphical system to the NC machine of the workshop. It contains only the data of the pieces independently of the NC machine. The datas of the parts are divided in :

- Header Data
- Description of the holes
- Description of internal and external contours with welding preparation
- Description of numerotation
- Description of the marks by powder or by punch
- Description of special cuts
- Description of bended parts

It is the distributor of the machine who must guaranty that its Postprocessor can transform the piece's data from this interface to a correct and collisions free machine program. The advantage of this interface is that the data introduced before the fabrication will not be affected if the workshop needs to use another machine. These changes in the workshop can be done without any changes in the piece data.

Interface file

The interface file is an editable text-file (ASCII-File). This file is created in the CAD computer and sorted by order, it can be transfered by any transfer procedure (KERMIT, DPCI, EMT for example) to the computer of the NC machine or directly in this one.

Each part has its own file. The name of the file is composed by the Name followed by an extension. For the extension, of maximum 3 characters, we recommend **NC**.The Name must be meaningful and contains the number of the Drawing and the Piece. So for example the file **Z23P15.NC** contains the data of the Piece 15 of the Drawing 23. Of course, you must control that the length of the Name is compatible with the Operating System used.

The syntax depends on the different possible descriptions which are described hereafter. The first two columns have a special meaning. They contain a **Code Bloc** giving the beginning of a part, the opening of a bloc or a comment line. The line with the **Code Bloc** is empty from the third column, the data lines start with two space. From the third column the format is free. The separator of the data is the space.
For compatibility reasons, the passage of a numerical value to a letter or vice-versa is also interpreted as a separator. (This is the reason why the numerical value must be separated either by at least one space, or by a letter which must be interpreted.)

Code bloc	Signification
ST	**ST**art = **beginning** of piece description
EN	**EN**de = **end** of piece description
BO	Opening bloc **hole**
SI	Opening bloc **numbering**
AK	Opening bloc **external contour**
IK	Opening bloc **internal contour**
PU	Opening bloc **powder**
KO	Opening bloc **mark**
SC	Opening bloc **cut** (Saw, Cutting)
TO	Opening bloc **To**lerance
UE	Opening bloc **Camber**
PR	Opening bloc **Pr**ofile description
KA	Opening bloc **Bending**
En (0 >= n <= 9)	Opening bloc definition **Plan n**
Bn (0 >= n <= 9)	Opening bloc **BO** of Plan **n**
Sn (0 >= n <= 9)	Opening bloc **SI** of Plan **n**
An (0 >= n <= 9)	Opening bloc **AK** of Plan **n**
In (0 >= n <= 9)	Opening bloc **IK** of Plan **n**
Pn (0 >= n <= 9)	Opening bloc **PU** of Plan **n**
Kn (0 >= n <= 9)	Opening bloc **KO** of Plan **n**
**	Comment Line Can be in any place of the interface These informations are also saved: it means that they cannot be lost with further uses.

Units

The interface contains free text, integer numbers (without unity), lengths, angles, weight and painting surfaces by meter.

Value	Unity	Format
Free Text	-	$ a (cadré à gauche, max. 80 Caract.)
Integer number	-	i
Length	[mm]	f (decimal number)
Angle	degree	f
Weight by meter	[kg/m]	f
Painting surface by meter	[m²/m]	f
Empty column	-	x

The angles are positive in the mathematical orientation (anti-clock-wise).

Used Profils

The interface is previewed for the current steel structure profiles. Considering the quantity of the different designations for different profiles, we will use a **Code Profile** to recognize them more easily.
The names and designations of the profiles are taken in the standard of DSTV called :
„**Einheitliche Bezeichnungen für den Datenaustausch im Stahlbau".**

Code Profile	Type of Profile
I	Profile **I**
L	Profile **L**
U	Profile **U**
B	Sheets, **Plate**, teared sheets, etc.
RU	**Round**
RO	**Rounded Tube**
M	**Rectangular Tube**
C	Profile **C**
T	Profile **T**
SO	**Special** Profile

The **Code profile** identifies the type of the profile.

The coordinates system of the piece

The different faces of a piece depend of the positions of the piece in the machine and are positionned in the coordinates system of these reference planes of the machine. The name of these reference planes and the position of the coordinates sytem by type of profile are represented in the scheme below.


```
V = Web=front face U = Bottom  O = Top  H = Behind
Np = Zero Point    T = Displacement Direction
```

All the coordinates are referenced to this coordinates system with theorical dimensions of perfect profiles perfectly lamined. The smallest X-coordinate of a piece is 0.0, the plates are described by the smallest rectangle in which they can be inserted.

System of Coordinates of the Standard Views
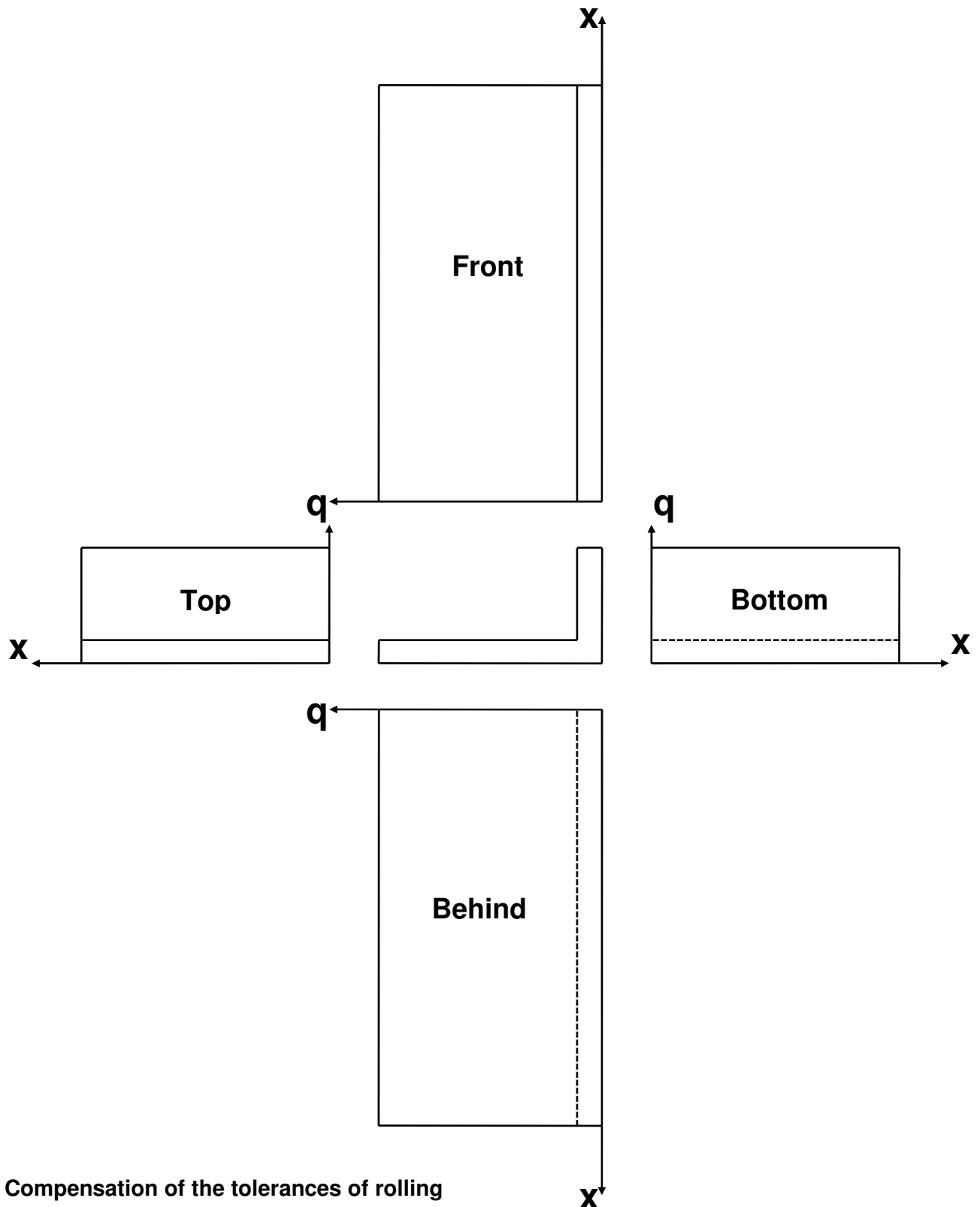
Compensation of the tolerances of rolling

The reference of the dimension (for example „upper edge") indicates from which edge of the piece the dimensions are taken. That means that the eventual tolerances of rolling will be placed on the opposite. If we give no reference for the dimension, the previous value stays valid. The reference of the dimension does not modify the value of a coordinate, it is the post-processor which must uses it to balance the tolerance of rolling.

Header data

The header data follow immediately the Code Bloc **ST** for the beginning of the description of the piece. They contain the most important data of the piece and the geometrical dimensions which are necessary for the NC.

Format	Signification		For the sheets
2x, a	Order identification		
2x, a	Drawing identification		
2x, a	Phase identification		
2x, a	Piece identification		
2x, a	Steel quality		
2x, i	Quantity of pieces		
2x, a	Profile		
2x, a	Code Profile		
2x, f [, f]	Length , Saw Length	< mm >	
2x, f	Profile height	< mm >	Width
2x, f	Flange width	< mm >	0.0
2x, f	Flange thickness	< mm >	0.0
2x, f	Web thickness	< mm >	Sheet thickness
2x, f	Radius	< mm >	
2x, f	Weight by meter	< kg/m >	kg/m²
2x, f	Painting surface by meter	< m²/m >	m²/m²
2x, f	Web Start Cut	< degree >	
2x, f	Web End Cut	< degree >	
2x, f	Flange Start Cut	< degree >	
2x, f	Flange End Cut	< degree >	
2x,a	Text info on piece		
2x,a	Text info on piece		
2x,a	Text info on piece		
2x,a	Text info on piece		

> **The skew cuts angles must be given in any case**

After this bloc containing the header data, follow, in any order, the blocs giving the form. We recognize them with the Code in the columns 1 and 2.
If the program cannot reads a bloc, it must skip to the line where it can found a readable bloc.

Saw length

If an Rough length is necessary for the workshop, this one is introduced behind the normal length as Saw length. The saw length is the length between the teorical points. We will always take the shortest one.
Length data in the Bloc **ST** : Length , Saw Length.

Saw length

Length
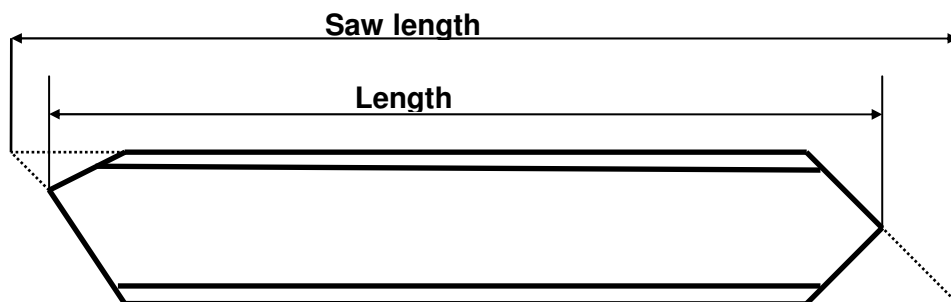
Skew Cuts

The skew cuts of the web are represented in the view of the front face, the ones of the flange in the bottom face.

Front

Bottom

+15 Degree   **-15**   **+15 Degree**   **-15**
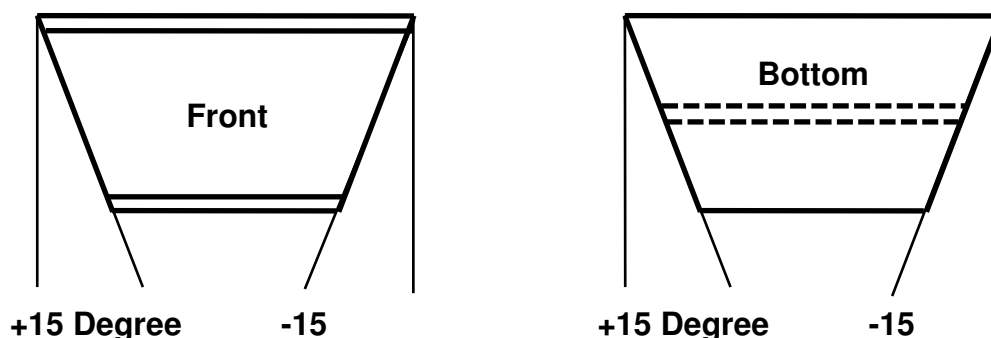
Bloc List of Holes

The Bloc List of holes starts by **BO** in column 1 and 2.

The data relative to a hole are composed by the reference plane of the piece in which the hole has to be done, the absolute coordinates in X and Y, the diameter, one Code for the fabrication and if necessary the data for slotted or rectangular holes.

For the countersink or threaded holes some more data are necessary. It is the post-processor which is doing the repartition for the steps for the pre-drilling and the thread. To describe the slotted or rectangular holes we add the value ttt.tt the letter "`l`" the width, height and the angle.

Format:
2xa1f   a1f   a1 f   1x f   a1 f   1x f   1x f

```
  o             o           g               l
..v xxxxxx.xx qqqqqq.qq  ddd.dd ttt.tt bbbb.bb hhhh.hh ww.ww
  u             s           m
  h             u           s                 l => slotted hole, rectangul. hole
                                              Values : Width, Height, Angle

                                =>  Complete hole. d= diameter, t= 0.0
                              g => Thread. d= diameter, t= 0.0
                              l => Left threaded, d= diameter, t= 0.0
                              m => Mark, Trace. d= 0.0, t= 0.0
                              s => Counter. d= Diameter. t=depth  countersink

                  o => Dimensions reference top edge
                    => Previous Dimensions reference
                  s => Dimensions reference axis
                  u => Dimensions reference bottom edge

      o => top flange
      v => front web
      u => bottom flange
      h => behind web
```
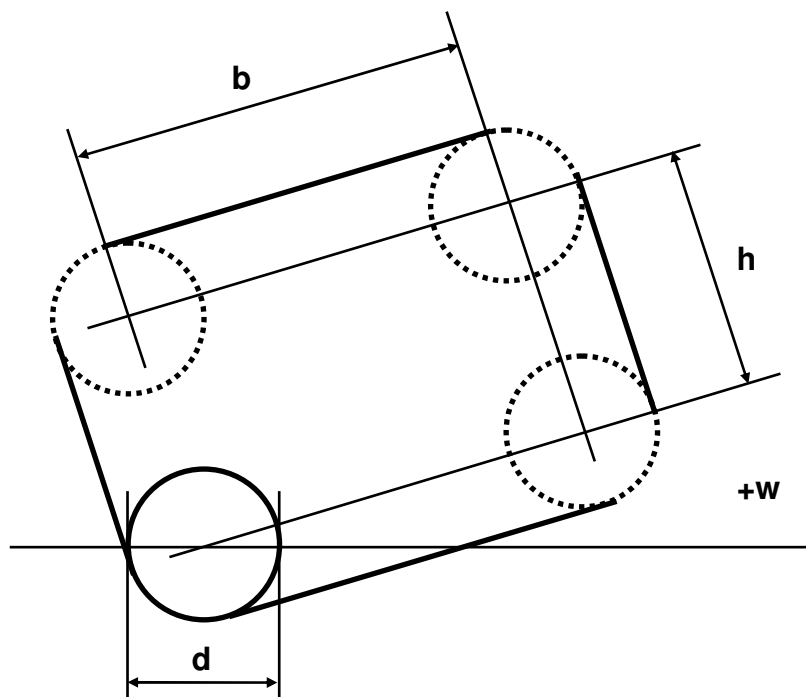
Complete holes, Not complete holes and Countersink holes

The dimensions, etc. for the countersink bolts follow the DIN 74 Part 1 and Part 2, the complete holes the DIN ISO 273 and the diameter for the pre-drilling for the threaded holes the DIN 336. The different forms of holes are represented in the four examples here after:
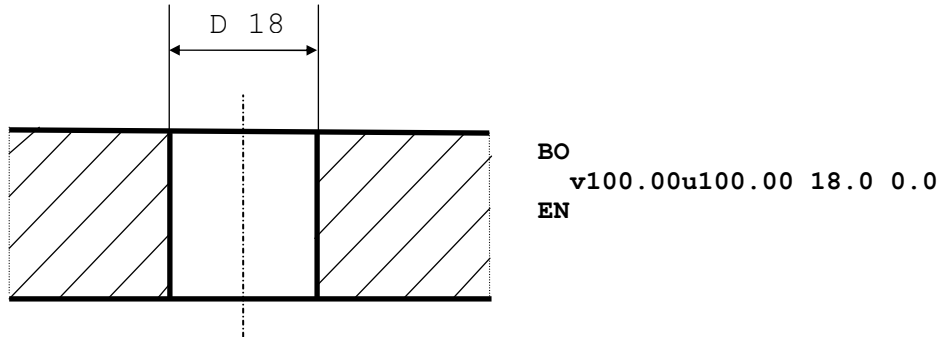

```
BO
  v100.00u100.00 18.0 0.0
EN
```
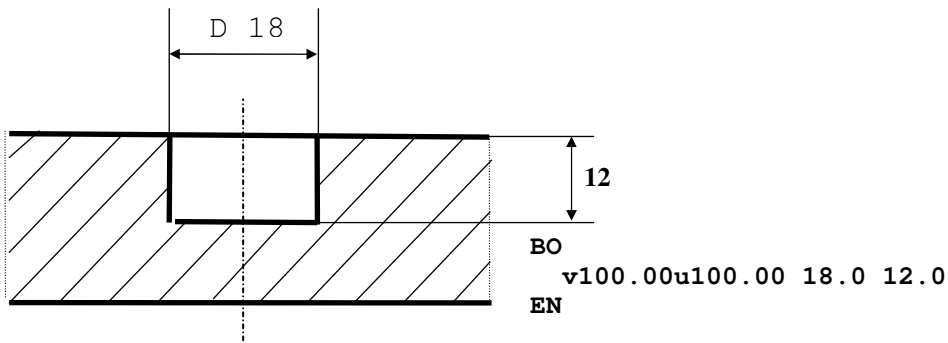


```
BO
  v100.00u100.00 18.0 12.0
EN
```
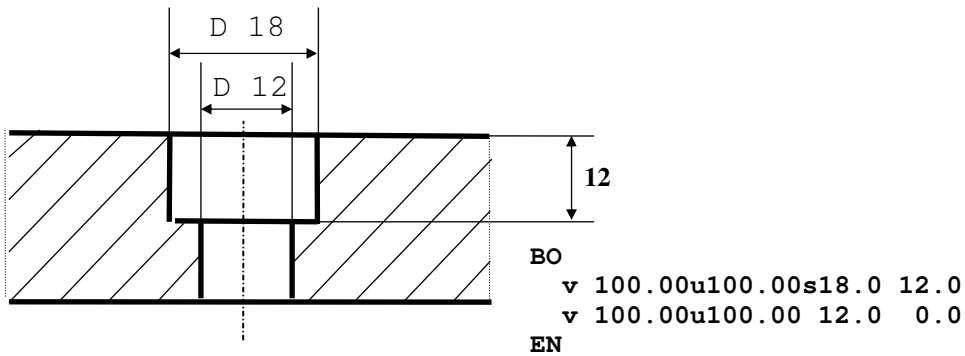


```
BO
  v 100.00u100.00s18.0 12.0
  v 100.00u100.00 12.0  0.0
EN
```
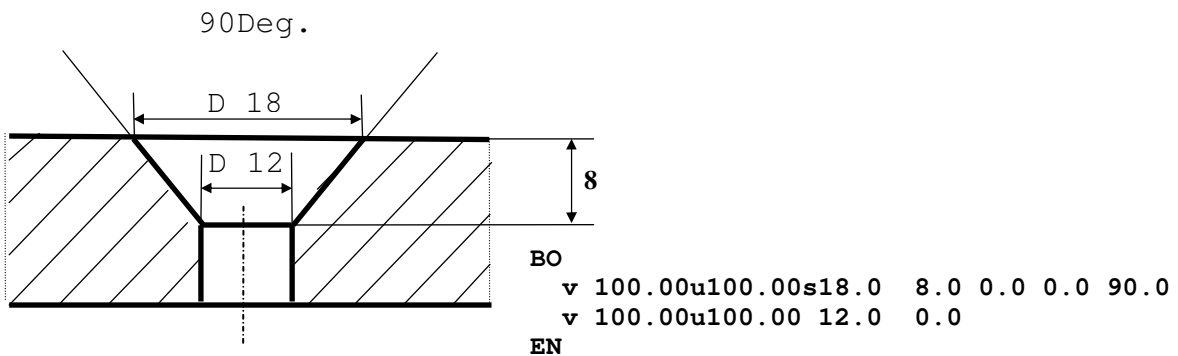


```
BO
  v 100.00u100.00s18.0  8.0 0.0 0.0 90.0
  v 100.00u100.00 12.0  0.0
EN
```

Bloc Marks by Powder or by Punch

The Bloc Marks by Powder or by Punch for the flame cutting begin by the Code Bloc **PU** for the powder and **KO** for the punch in column 1 or 2.

The description is identical to the internal contour one.

Format:
2xa1 f   a1 f   1x f

```
   o          o
..v xxxxxx.xx   qqqqqq.qq rrr.rr
  u          s
  h          u                 |
                               |   Radius
                       |
                       | o => Dimensions reference top edge
                       |   => Previous Dimensions reference
                       | s => Dimensions reference axis
                       | u => Dimensions
        |
        |
        | o => top flange
        | v => front web
        | u => bottom flange
        | h => behind web
        |
```

From the second point of a same contour, it is no more necessary to indicate to which face the contour belongs.

Bloc Numeration

The Bloc Numeration starts by the Code **SI** in column 1 and 2.

The data for a numbering are composed by the reference plane of the piece in which the numbering will be done, the absolute coordinates in X and Y, an angle, the text height and the text to write itself.

Format:
2xa1f   a1 f   1x f   1x i a1 40a1

```
   o        o               r
..v xxxx.xx qqqq.qq ww.ww hhh  a.....a
  u        s               z
  h        u               |
                           |   r => The Text follow the piece if turned
                           |   empty => Text at the same position
                           |   z => Force all parameters
                           |         If one or more parameters are not done
                           |         The numeration is not done.
                    |
                    |  Text Height (mm)
              |
              |  Angle
           |
           | o => Dimensions reference top edge
           |   => Previous Dimensions reference
           | s => Dimensions reference axis
           | u => Dimensions
     |
     | o => top flange
     | v => front web
     | u => bottom flange
     | h => behind web
     |
```

Bloc external & internal Contour

The Bloc Contour starts by **AK** or **IK** in the column 1 and2.

The Bloc External Contour must not be introduced, if the piece is completely described by its length, its dimensions and its skewed cuts in the header data or if the Bloc Cut has been completely and correctly described.

The description of the contour is based on the introduction of Points and parallely introduction of radius. The sign + in front of the Radius gives the orientation of this one: the sign + is the mathematical orientation. The maximal angle is +/- 180°. We must divide an angle of 220° in 2 angles : 180° and 40°

All contours have to be closed, it means that the coordinates X and Y of the first and the last point of the contour are identical. All others points of the contour cannot be described two times. The external contours are described in the mathematic orientation and the internal contours clockwise.

For the profiles, the description of the contour is done by a transformation of the profile in plates. The dimensions of the plates is the total height of the profile, for example the web of a beam HEB has a height equal to the width of the web plus the thickness of the two flanges.

A „Plate" defined like this is easily identified by the letters "o, u, v, h" each letter gives the right reference plane of the beam. Each "Plate" is one face of the beam, it is in real dimensions, and no other material can be in interference with it. You can use all the faces but it is better to use first the faces "o et v". If for a profile, by following the rules here-before, we have several outside contours(in the same view), they will be merged in a unique one. Thus a Rectangular Tube(M) and a C Profile(C) will only have a "PLATE" to describe their web contour.

Format:
```
2xa1f          a1 f          a1 f     1x f     1x f     1x f     1x f

   o              o             t
..v xxxxxx.xx    qqqqqq.qq    rrr.rr www.ww yyy.yy www.ww yyy.yy
   u              s             w
   h              u
                                          Value for the welding preparation

                                 Radius
                             t or w : Tool for the notche

                  o => Dimensions reference top edge
                    => Previous Dimensions reference
                  s => Dimensions reference axis
                  u => Dimensions

      o => top flange
      v => front web
      u => bottom flange
      h => behind web
```

From the second point of a same contour, it is no more necessary to indicate to which face the contour belongs.

For the round tubes and the solid rounds, the „Plate" will be the development of the external cylindric surface of the profile. The width of the "plate" will be the external perimeter of the profile, it is described in „V".

All the contours describe the external edge of the material. If we have also welding preparation they are oriented to the external edge of the contour described in the direction of the material. For the Profiles „divided" in „Plates" the special cuts in direction of the material can be specified by the welding preparation.

Welding preparation (Forming of the edges)

For all the "Plates" described by contour we can give the forming of the edges of the thickness of the plates by introducing the welding preparation.
Two values can be introduced after the radius of a point of the contour, they give for this point the angle of flamecutting (Phi) to the verticale and the distance Y see sketches.

We will use two couples of values if we need a welding preparation on both sides. Phi can be positive or negative see sketches.
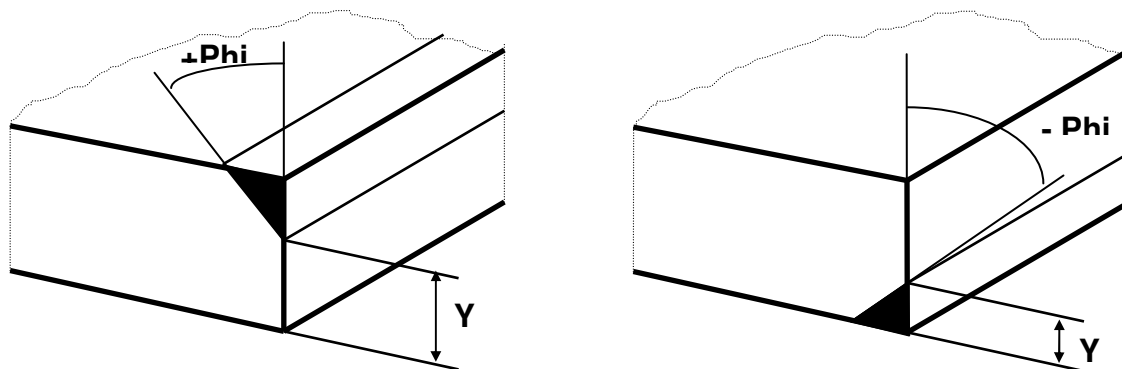
Notches

When notches are needed, the Bloc AK contains an information line which is not a part of the contour description.
This line contains the coordinates of the corner as well as the type of radius to notch this corner. We write "t" if we want a tangential notch or a "w" if we want a hole like hereafter.
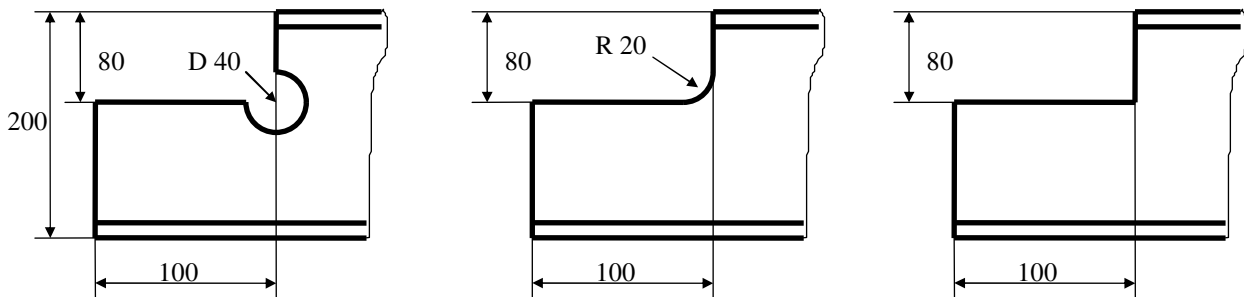
AK			
v	100.00u	200.00	0.00
	100.00	140.00	-20.00
→	100.00	120.00w	-20.00
	100.00	100.00	-20.00
	80.00	120.00	0.00
	0.00	120.00	0.00
	0.00	0.00	0.00

AK			
v	100.00u	200.00	0.00
	100.00	140.00	-20.00
	100.00	120.00t	-20.00
→	80.00	120.00	0.00
	0.00	120.00	0.00
	0.00	0.00	0.00

AK			
v	100.00u	200.00	0.00
	100.00	120.00	0.00
→	100.00	120.00w	0.00
	0.00	120.00	0.00
	0.00	0.00	0.00

Bloc Cut (Saw, Cutting)

The Bloc Cut is opened by the Code Bloc **SC** in column 1 and 2. The cuts are always given by a normal vector to the initial or final section of the profile coming out from the material to outside. This normal vector starts from a specific point of the section.

Format:
```
2x 1x f         1x f         1x  f        1x  f        1x  f        1x  f
_____

  .. xxxxxx.xx yyyyyy.yy zzzzzz.zz xxxxxx.xx yyyyyy.yy zzzzzz.zz
         |         |        |          |         |        |
       |_____|  |_____|
          Specif. Pt. Of the section    Data  of the normal vector
                                        (from the section to outside)
```

Bloc Tolerance

The Bloc Tolerance starts with the Code Bloc **TO** in column 1 and 2 and must be distribute proportionnaly on the length of the piece.

The Tolerance values for one length of beam are given by a minimum and a maximum value.

Format:
```
2x  f        1x  f
_____

..xxxx.xx yyy.yy
     |       |
     |     |_____|
     |        Maximum Value
     |
   |_____|
      Minimum Value
```

Bloc Camber (Preform)

The Bloc Camber starts by the Code **UE** in the column 1 and 2.

All the coordinates of the interface are given for the beam WITHOUT camber.

Format:
```
 2xa1f        1x f
_____

   o
..v xxxx.xx uuuu.uu
  u   |       |
  h   |       |
  |   |       |
  |   |     |_____|
  |   |        Dim. in Y of the Camber
  |   |
  |   |
  |   |_____|
  |      Dim. in X of the Camber
  |
  | o => top flange
  | v => front web
  | u => bottom flange
  | h => behinf web
  |_____|
```

Bloc Plane Definition

We can use more **Planes** only for the Geometries, for which the reference Plane cannot be described by the standard faces of the pieces, given by the letters:

- **v** for Front,
- **o** for Top,
- **u** for Bottom and
- **h** for Behind

The Definition starts with the Code Bloc **E** in Column 1 and a Number between **0** and **9** in Column 2, which is the number of the **Plane**.

After we have 3 lines,
- the first contain the coordinates X-, Y- and Z- of the Original Point of the **Plane**,
- the second contain the coordinates of a point of the X- axis situated at 100mm from the Origin
- the third contain the coordinates of a point of the Y- axis situated at 100mm from the Origin.

As Origin of the **Plane** we take one of the 2 intersection Points of the **Plane** with the Y- Axis and the Z- Axis of the system of coordinates of the piece, the right point is the point which has the smaller distance with the zero-point of the piece.

After the definition of the **Plane** are written the affiliated geometries, in that the opening Code Bloc of the Bloc contains in column 2 the number of the **Plane** to which it is reported. The letter at the start of the lines of coordinates giving the face of the piece (for example. v for Front) is not existing if these lines are reported to a **Plane**.

To not reach the limit of 10 definitions of **Plane**, we can call several times the same number. Before the new call of a number of **Plane** the description of geometries which are reported to the old **Plane** must be finished**.**

The use of the Blocs **BO**, **IK** used for standard pieces, can also be done after the definition of additional **Plane**.

Example of file with a call to an additional Plane E1:

```
ST
**NC-DSTV-Schnittstelle, Stand Juli 1998
  1
  1
  14
  14
  RST37-2
  2
  ZS175*1.5
 SO
   1133.00
    175.00
     81.00
      1.50
      1.50
      4.00
     4.416
     0.753
     0.000
     0.000
     0.000
     0.000
  Pfette


PR
  +   0.000    79.500    0.00
  +  48.000    79.500    0.00
  + 311.000   165.000    0.00
  + 347.000   165.000    0.00
  + 347.000    23.415    0.00
  + 310.400     2.259    0.00
  + 311.910     0.000    0.00
  + 350.000    21.650    0.00
  + 350.000   168.000    0.00
  + 310.510   168.000    0.00
  +  47.540    82.500    0.00
  +   3.000    82.500    0.00
  +   3.000   239.820    0.00
  +  39.620   260.950    0.00
  +  38.120   263.550    0.00
  +   0.000   241.550    0.00
  +   0.000    79.500    0.00
E1
     0.00      0.00     90.00
   100.00      0.00     90.00
     0.00    151.00     41.00
B1
   1100.00u    53.00     18.00
   1100.00u   131.00     18.00
S1
    100.00u    50.00   0000.00     5 1/1/14
EN
```
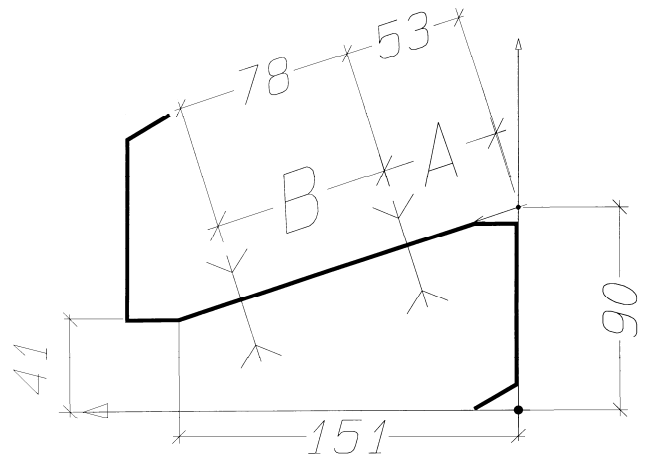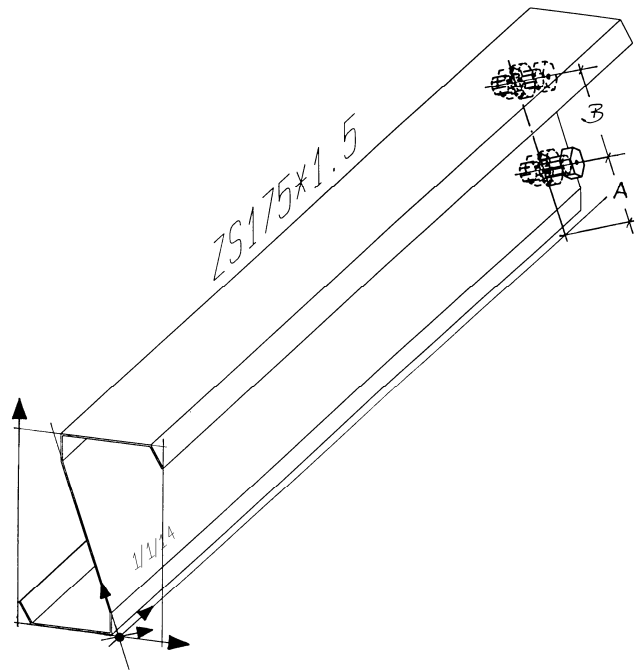
Comment:

For the description of Special Profiles the Section of the profile is defined by the **Bloc Profile**. With the introduction of the interfaces of the Steel Structure Products and the Standardization of the Material description, the preparation of a List of Special Profiles is discussed. This List will clarify the names of Profiles, their Section and their Position refered to the Coordinates System of the Piece. As soon as the used Profile will be in the List, we can forget to use the **Bloc Profile**.
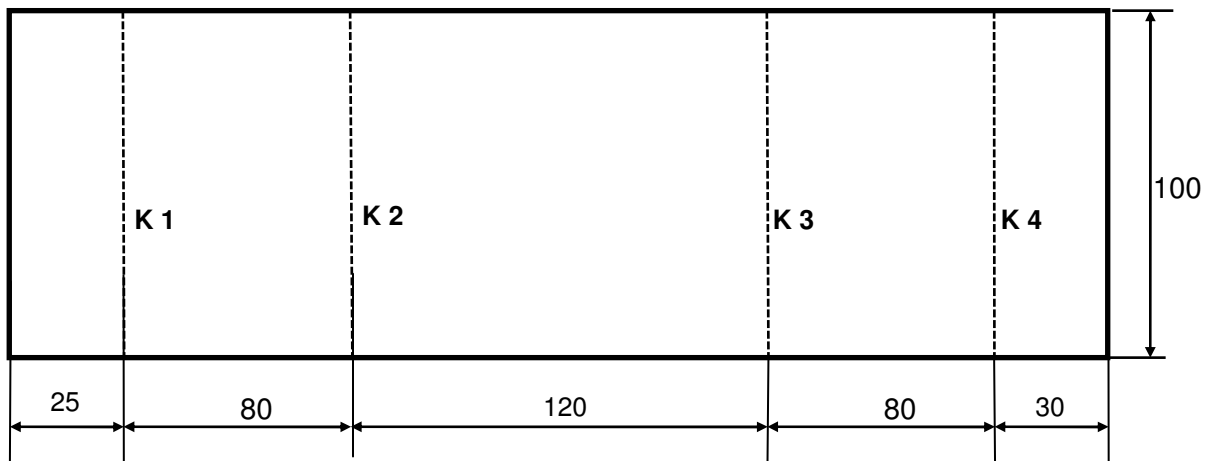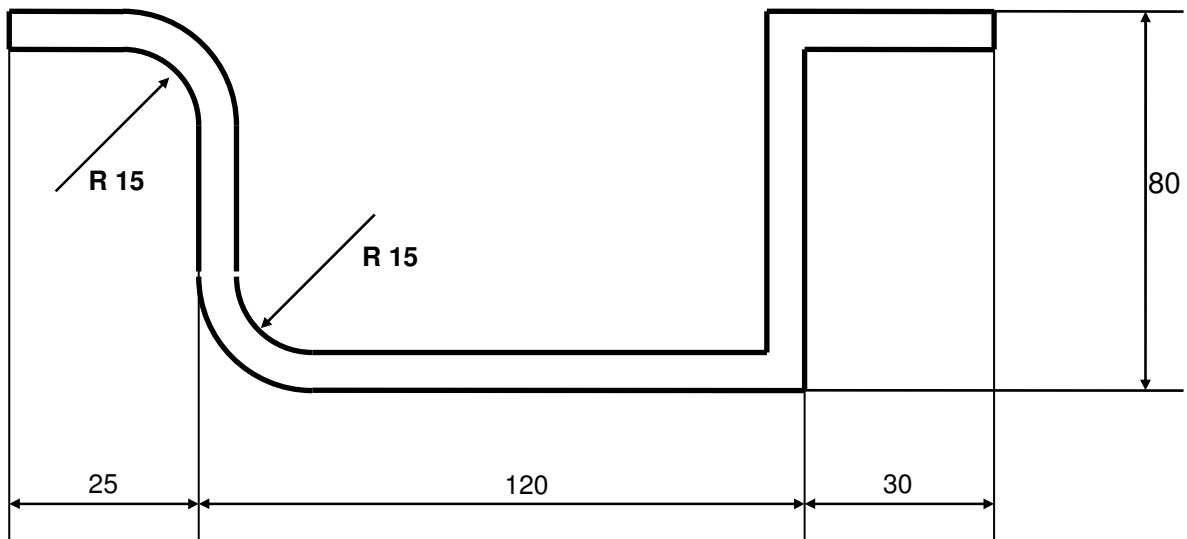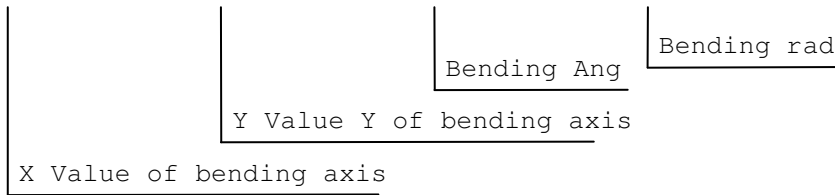
Bloc Bended Parts

The Bloc of the bended parts begins by **KA** in the columns 1 and 2.

After we have for every axis of bending a line with the coordinates of the two points giving the axis of bending, which is in the plane of the material, then the angle and the radius of bending. The coordinates of the bending are given like all other elements compared to the the piece not bended. The sign in front of the angles gives the direction of these angles. A positive angle describes a bending in the plane XY in Z positive direction.

Format:
2x f   1x f   1x f   1x f

```
..xxxxxx.xx    yyyyyy.yy    www.ww        rrr.rr
```

Bending rad

Bending Ang

Y Value Y of bending axis

X Value of bending axis

R 15

R 15

80

25   120   30

K 1   K 2   K 3   K 4

100

25   80   120   80   30

```
KA
  25.0 0.0   25.0 100.0 -90.0 15.0
 105.0 0.0  105.0 100.0  90.0 15.0
 225.0 0.0  225.0 100.0  90.0
 305.0 0.0  305.0 100.0 -90.0
```

Bloc Profile (Own user profile sections)

The Bloc Profile begins by **PR** in the column 1 and 2.

The section of the profile can be described by the Code Bloc **PR** .

The description is done by the contour description. In place of the letters giving the face of the piece we give a sign '+' for the external contours, and a sign '-' for the internal contours of the sections. The description of the contour must follow a normal rotation without crossing. The description is possible only in one of the four faces.
The Code Profile must be **SO**.

Format:
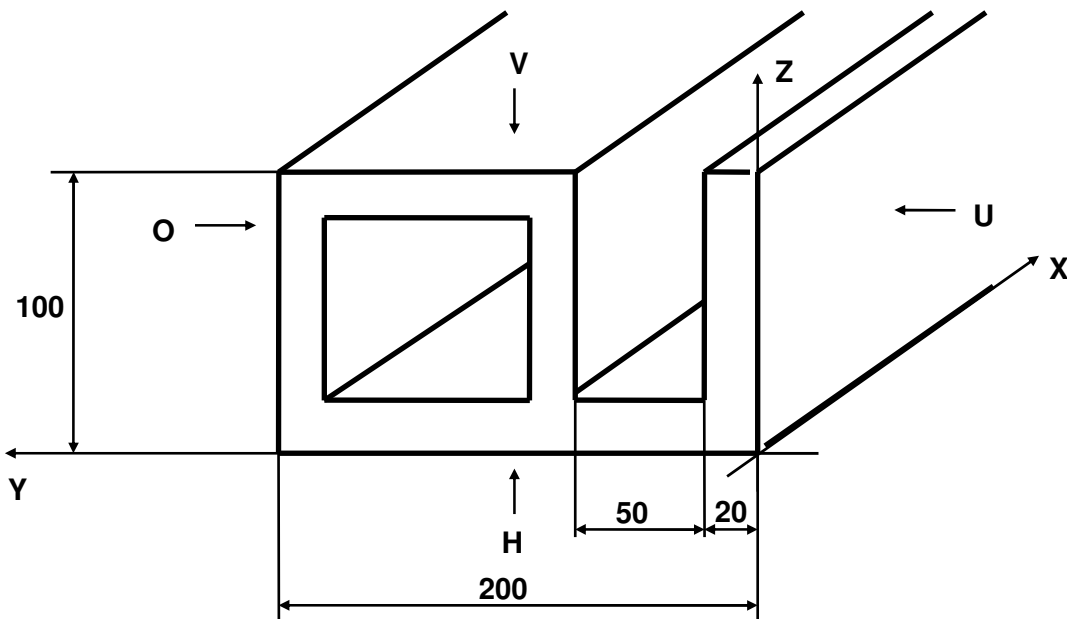**2xa1f   1x f   1x f**

```
  +
..- yyyyyyy.yy    zzzzzz.zz   rrr.rr
   |                           |
   |                          |Radius
   | + => Code for external Contour
   | - => Code for internal Contour
   |_____|
```



```
PR
  +    0.0     0.0    0.0
  +    0.0   100.0    0.0
  +   20.0   100.0    0.0
  +   20.0    20.0    0.0
  +   70.0    20.0    0.0
  +   70.0   100.0    0.0
  + 200.0   100.0    0.0
  + 200.0     0.0    0.0
  +    0.0     0.0    0.0
  -   90.0    20.0    0.0
  -  180.0    20.0    0.0
  -  180.0    80.0    0.0
  -   90.0    80.0    0.0
  -   90.0    20.0    0.0
```

Bloc Informations

The Bloc Informations begins by **IN** in the columns 1 and 2.

The data for an information is composed by the description of the area, the separator column (:) and the contents of the area.

Format:
2xa   a1   a   .

```
..a...a :   a.....a
  |    |    |
  |    |    Contents
  |    |
  |    Separator
  |
  Description in german
```

```
IN
    BESTELLER           : Customer
    OBJEKT              : Object
    PROJEKTLEITER       : Project manager
    STARTTERMIN         : Start date
    ENDTERMIN           : End date
    GRUNDANSTRICH       : First painting
    DECKANSTRICH        : Final painting
    ENTZUNDERUNG        : Blasting
    VERZINKUNG          : Galvanized
    GEZEICHNET VON      : Drawned by
    GEZEICHNET AM       : Drawned on the
    GERÜFT VON          : Controled by
    GEPRÜFT AM          : Controled on the
```

```
ST
**NC-DSTV-Schnittstelle
  DSTV
  1
  3
  3
  RST37-2
  1
  HEB400
  I
    2000.00
     400.00
     300.00
      24.00
      13.50
      27.00
   155.000
     1.930
     0.000
     0.000
     0.000
     0.000
  TRAEGER


BO
  v 1512.00o  144.00 24.00 0.00l  100.00    60.00    10.00
  v  450.00o  280.00   24.00
  v  900.00o  300.00   29.00
AK
  v  200.00o    0.00    0.00
  v 1952.00o    0.00    0.00 -18.430   13.50
  v 1952.00o  350.00    0.00
  v 1750.00o  350.00    0.00
  v 1750.00o  400.00    0.00
  v  163.50o  400.00    0.00
  v  150.00o  325.00    0.00
  v    0.00o  325.00    0.00
  v    0.00o  100.00    0.00
  v  190.00o  100.00  -10.00
  v  200.00o  100.00w  -10.00
  v  200.00o  110.00  -10.00
  v  200.00o   90.00    0.00
  v  200.00o    0.00    0.00
BO
  u 1415.00s  251.50 24.00 0.00l   70.00     0.00     0.00
  u  350.00s   98.00   18.00
  u  650.00s  229.00   20.00
  u 1150.00s  240.50   22.00
AK
  u  200.00s    0.00    0.00
  u 1900.00s    0.00    0.00
  u 2000.00s  300.00    0.00
  u  200.00s  300.00    0.00
  u  200.00s    0.00    0.00
BO
  o 1415.00s  251.50 24.00 0.00l   70.00     0.00     0.00
  o  350.00s   98.00   18.00
  o  650.00s  229.00   20.00
  o 1150.00s  240.50   22.00
AK
  o  159.50s    0.00    0.00 10.000    0.00
  o  159.50s  300.00    0.00
  o 1750.00s  300.00    0.00
  o 1750.00s    0.00    0.00
  o  159.50s    0.00    0.00
SI
  u  200.00u  225.00 0000.00     5 1/1/1
```

3 (1x), HEB400..2000

1 (1x), HEB400..2000