HACO

for impressive

performances

TOOLING CATALOGUE

Bending table

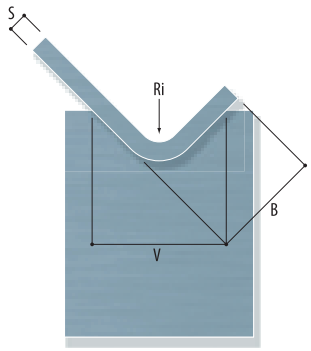

FIGURE 01

V = die-opening
B = minimum length of the leg for a bending angle α = 90°
Ri = internal radius of the bend
F = required bending force in tonnage per meter bending length
S = plate thickness in mm

Remark: this table is only suitable for mild steel with Rm = 450 N/mm² and E = 210000 N/mm² and only applicable to air bending!

V	F (T/m)	4	5	6	7	8	10	12	14	16	18	20	25	32	40	50	63	80	100	125	160	200	250
B	F (T/m)	2,8	3,5	4,2	4,9	5,7	7	8,5	10	11	13	14	18	23	28	35	45	57	71	88	113	141	177
Ri		0,6	0,8	1	1,1	1,3	1,6	1,9	2,2	2,6	2,9	3,2	4	5	6,5	8	10	13	16	20	25	32	40
S																							
0,5		4	3																				
0,6		6	5	4	3	3																	
0,8		7	8	7	6	5	4																
1		9	13	11	9	8	6	5															
1,2				15	13	12	9	8	7														
1,4					18	16	13	10	9	8													
1,6						20	16	14	12	10	9												
2							26	51	18	16	14	13											
2,3								28	24	21	19	17	14										
2,6									31	27	24	22	17	13									
3										36	32	29	23	18									
3,2											36	33	26	20	16								
3,5												39	31	24	20	16							
4												51	41	32	26	20							
4,5													52	40	32	26							
5														50	40	32	25						
6															58	46	37	29					
7															78	63	50	39	31				
8																82	65	51	41				
9																	82	65	52	41			
10																		80	64	51	40		
12																		115	92	74	58	46	
16																			164	131	102	82	65
19																				185	144	115	92
22																					193	155	124
25																					250	200	160
30																						288	230

CONFIGURATIONS

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Different tool-systems are offered to fulfill the specific needs of the customers.

Configuration 1: HACO

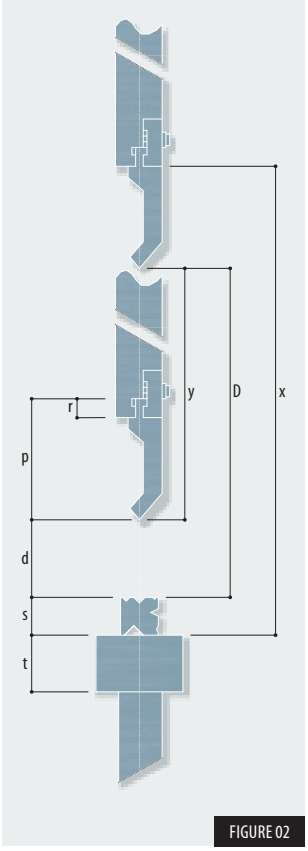

FIGURE 02

Configuration 2: SYSTEM

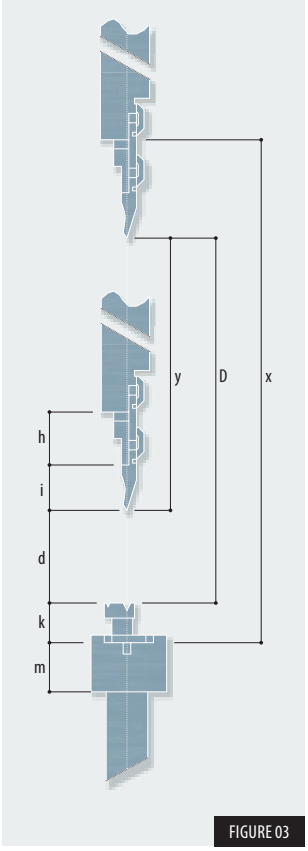

FIGURE 03

Configuration 3: NEW STANDARD

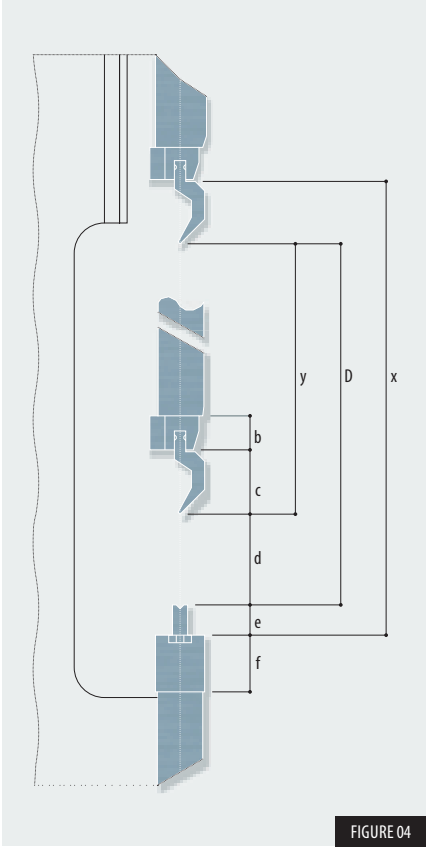

FIGURE 04

legend

b = height modufix manual/hydraulic clamping
c = height equidur tooling
D = remaining opening - ram in top dead centre
d = remaining opening - ram in bottom dead centre
e = height OZU – Single-V die
f = height (anti-deflection-) table for OZU – Single-V die
h = height intermediate part System tooling
i = height punch System tooling
k = height die System tooling
m = height (anti-deflection-) table for System tooling
p = total height punch Haco type
r = height clamping Haco type punch
s = height Haco type Multi-V die
t = height (anti-deflection-) table for Haco Multi-V die
x = total daylight-opening
y = stroke

Remaining opening d when ram is in top dead centre?

- D = X - P + R - S ..... when using configuration 1
- D = X - H - I - K ..... when using configuration 2
- D = X - C - E ..... when using configuration 3

'D' must be at least = plate thickness + desired daylight-opening (so positif).

Remaining opening d when ram is in bottom dead centre?

- d = X - P + R - S - Y ..... when using configuration 1
- d = X - H - I - K - Y ..... when using configuration 2
- d = X - C - E - Y ..... when using configuration 3

'd' always needs to be a negative value.
'd' always needs to be at least half the V-opening to be able to bend down to 90° (e.g. V-opening = 12 mm => 'd' needs to be ≤ -6 mm).

SYSTEM TOOLING

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FIGURE 05

System tooling is available in a wide range of different bottom and top tools, to adapt the machine to almost any specific job. System tooling is manufactured within the smallest tolerances in standard lengths of 835 and 415 mm so they can be put together to achieve larger lengths. System bottom tooling in combination with an anti-deflection table results in a machine with the highest degree of accuracy.

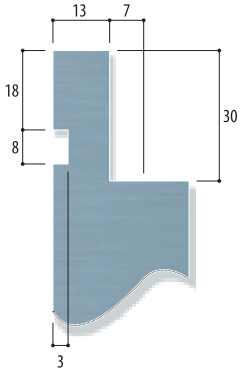
System tooling has the following characteristics:

- Material ..... C 50
- Dies have hardened and ground shoulder radii ..... 52 à 58 HRC
- Punches have a hardened and ground tip ..... 52 à 58 HRC
- Punches and dies are available in following lengths ..... 835 mm - 415 mm - 835 mm, sectionalised

Items marked with ✶ are available ex stock, others according to actual delivery time.

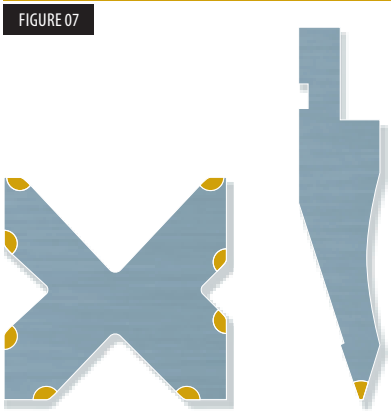
Dimensions standard clamping CE-tooling.

FIGURE 06



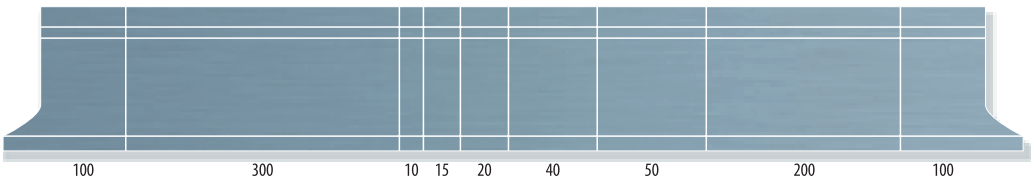
System tooling is only hardened and ground on the indicated places.

FIGURE 07



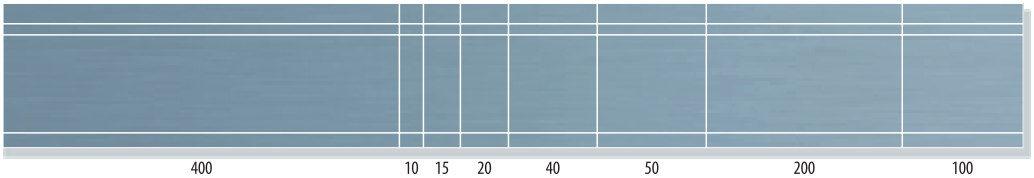
Standard sectionalised system punches.

FIGURE 08



Standard sectionalised system dies.

FIGURE 09



SYSTEM TOOLING

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Tooling composition for pressbrakes with different working lengths.

pressbrake - bending length:
- 1600 mm = (2 x 835 mm)
- 2000 mm = (2 x 835 mm) + (1 x 415 mm)
- 2500 mm = (3 x 835 mm)
- 3000 mm = (4 x 835 mm)
- 3600 mm = (4 x 835 mm) + (1 x 415 mm)
- 4000 mm = (5 x 835 mm)
- 4300 mm = (5 x 835 mm) + (1 x 415 mm)
- 5000 mm = (6 x 835 mm)
- 6000 mm = (7 x 835 mm) + (1 x 415 mm)

It is possible to equip a pressbrake, machined to take Haco type uppertooling, with System tooling when a special, optional, intermediate clamp is used. The height of this intermediate clamp (see figures 10 and 11) depends on:
- daylight opening of the pressbrake;
- tooling being used.

Prices and specifications are available on request. Please give dimensions A to D (or tonnage and bending length of the pressbrake), daylight opening and the tooling being used. The height of the intermediate clamp (dimension E) can thus be determined by us.

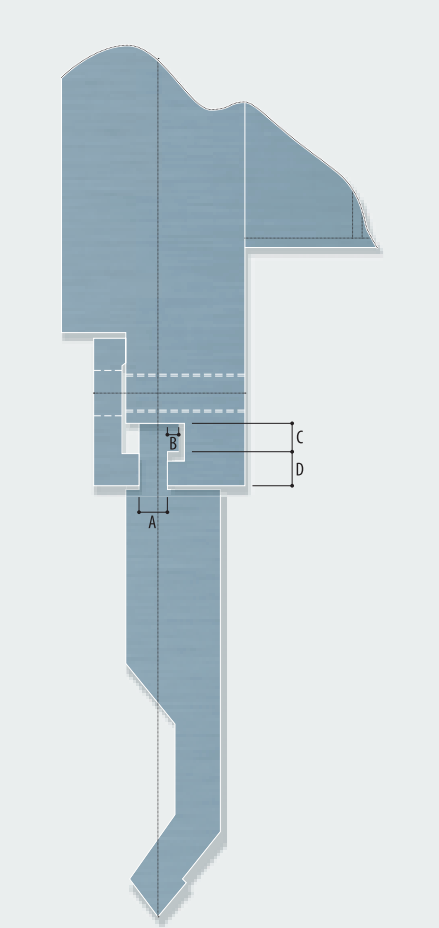

FIGURE 10

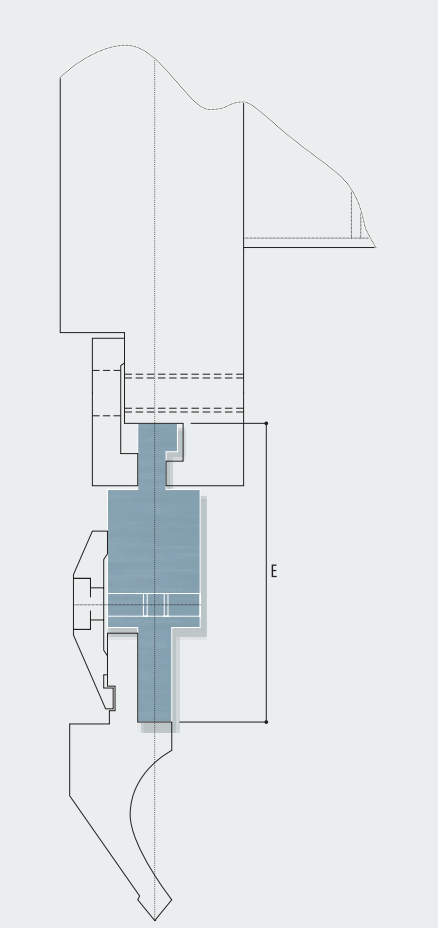

FIGURE 11

Height of the intermediate clamps to take System tooling (see figure 12) are as follows:
- capacity ≤ 1500 kN ..... H = 100 mm
- 1500 kN < capacity ≤ 2250 kN ..... H = 150 mm
- capacity > 2250 kN ..... Haco tooling

Upper tools can be turned when using special bolts (on request).

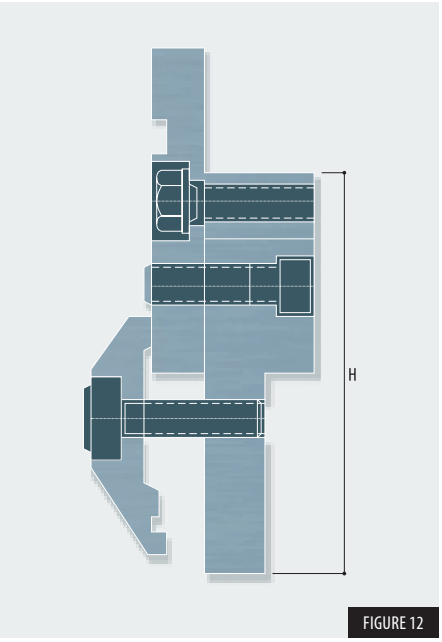

FIGURE 12

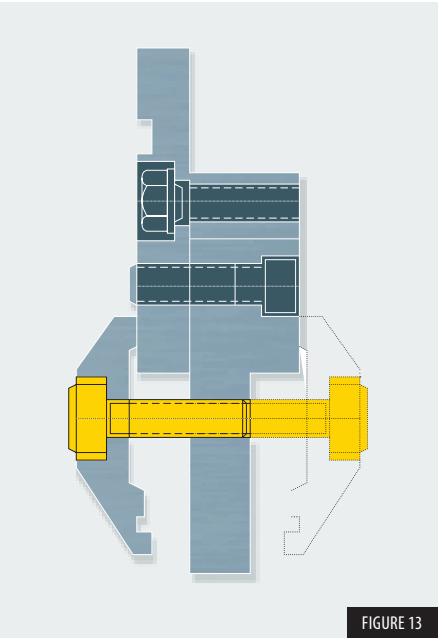
FIGURE 13

SYSTEM TOOLING

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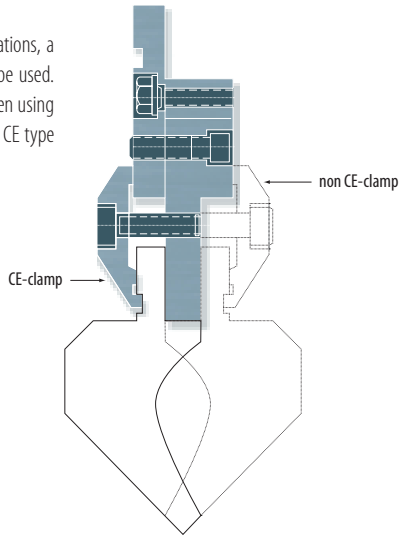
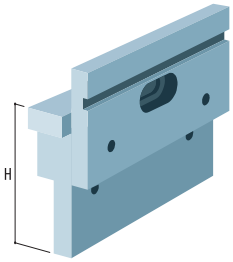
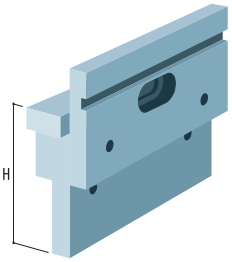
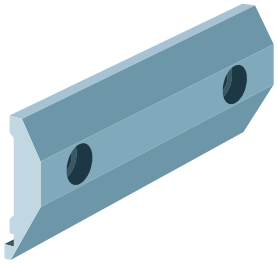
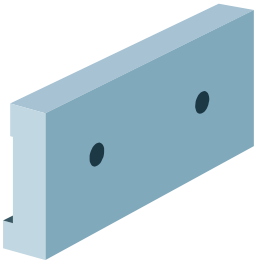
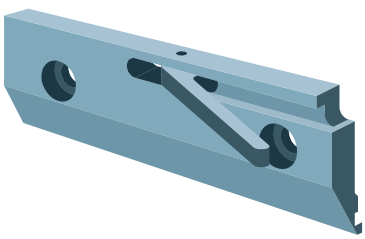
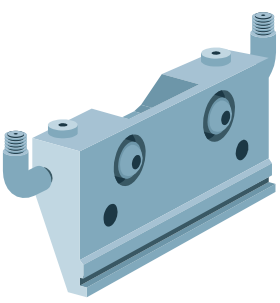
When using System tooling there is, in accordance with the current CE regulations, a groove in the length of the bending punch. An adapted securityclamp must be used. When using this securityclamp, it only is possible to clamp CE type tooling. When using a special clamp (non CE) both CE type tooling (with security-groove) and non CE type tooling (no security-groove) can be clamped.

FIGURE 14



Clamps for system tooling.

Remark: when ordering the above mentioned intermediate parts, security clamps are not yet included.
Remark: the intermediate parts are delivered with anti-deflection wedge.

FIGURE 15	**Intermediate part for System tooling**	FIGURE 16	**Intermediate part for System tooling**
max. 100 T/m H = 100 order number STSG100		max. 100 T/m H = 150 order number STSG150	
FIGURE 17	**Security clamp for System tooling with groove**	FIGURE 18	**Clamp for System tooling without groove**
100 T/m order number SKLG1		70 T/m order number STSG100	
FIGURE 19	**Security clamp for System tooling with groove – fast manuel clamping**	FIGURE 20	**Security clamp for System tooling with groove – hydraulic clamping**
50 T/m order number S4003BRG		100 T/m order number PHCUT	

SYSTEM TOOLING

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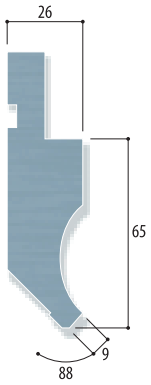
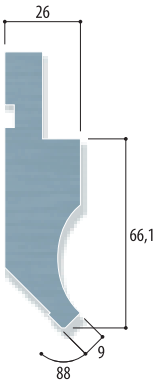
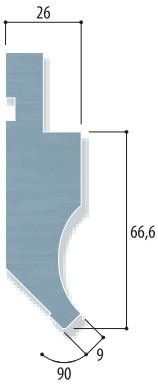
100 T/m	★
X = 2,9	
SG1010881	835
SG1010882	415
SG1010883	SCT



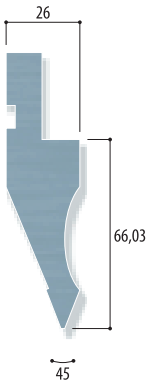
100 T/m	★
X = 0,8	
SG1010884	835
SG1010885	415
SG1010886	SCT



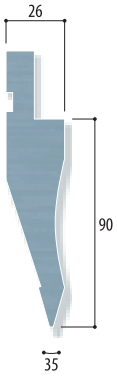
100 T/m	
X = 0,8	
SG1010901	835
SG1010902	415
SG1010903	SCT



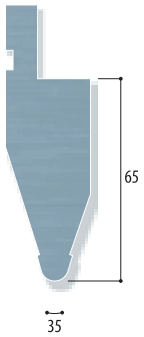
70 T/m	
X = 0,8	
SG1011451	835
SG1011452	415
SG1011453	SCT



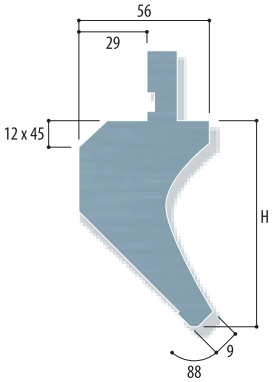
50 T/m	★
X = 0,8	
SG1012351	835
SG1012352	415
SG1012353	SCT



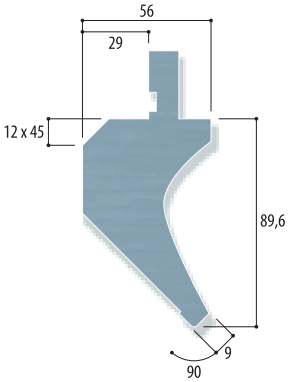
100 T/m	
R = 5	
SG1013351	835
SG1013352	415
SG1013353	SCT



50 T/m	★
X = 2,9	
H = 88,5	
SG1014881	835
SG1014882	415
SG1014883	SCT
X = 0,8	
H = 29,59	
SG1014884	835
SG1014885	415
SG1014886	SCT



50 T/m	
X = 0,8	
SG1014901	835
SG1014902	415
SG1014903	SCT



★ = ex stock

SYSTEM TOOLING

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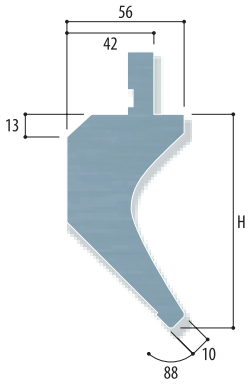
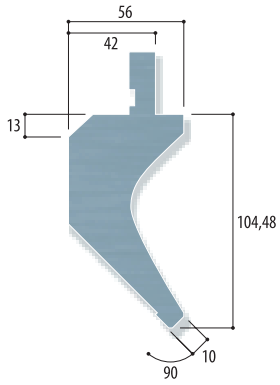
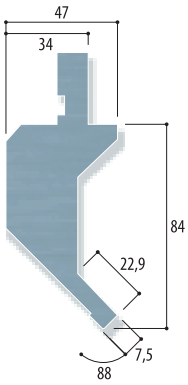
50 T/m	
X = 3,0	
H = 103,45	
SG1015881	835
SG1015882	415
SG1015883	SCT
X = 1,0	
H = 104,48	
SG1015884	835
SG1015885	415
SG1015886	SCT



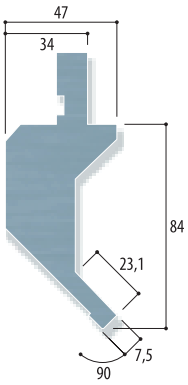
50 T/m	
X = 1,0	
SG1015901	835
SG1015902	415
SG1015903	SCT



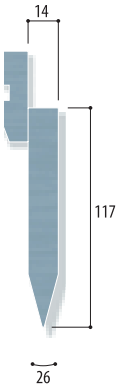
15 T/m	
X = 0,8	
SG1016881	835
SG1016882	415
SG1016883	SCT



15 T/m	
X = 0,6	
SG1016901	835
SG1016902	415
SG1016903	SCT



50 T/m	
X = 0,8	
SG1017261	835
SG1017262	415



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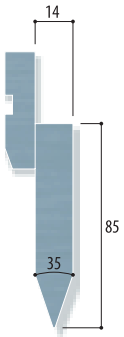
X = 0,8	
SG1017351	835
SG1017352	415



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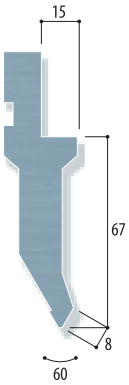
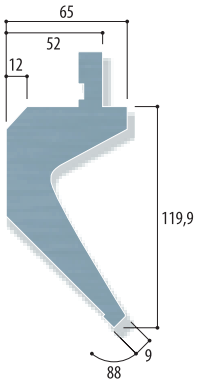
X = 0,8	
SG1018601	835
SG1018602	415
SG1018603	SCT



50 T/m	
R = 0,2	
SG1020881	835
SG1020882	415
SG1020883	SCT



SYSTEM TOOLING

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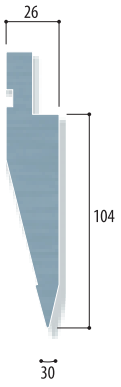
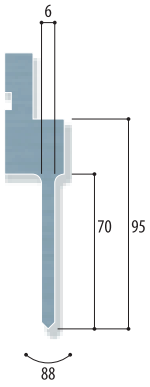
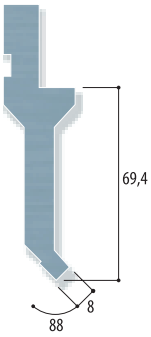
100 T/m	
R = 0,8	
SG1021301	835
SG1021302	415
SG1021303	SCT



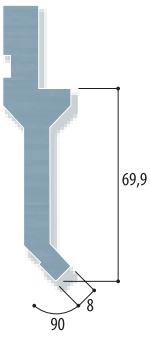
50 T/m	
R = 0,2	
SG1022881	835
SG1022882	415
SG1022883	SCT



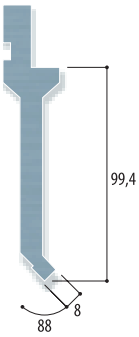
30 T/m	
R = 0,2	
SG1023881	835
SG1023882	415
SG1023883	SCT



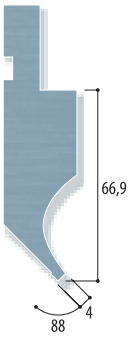
30 T/m	
R = 0,2	
SG1023901	835
SG1023902	415
SG1023903	SCT



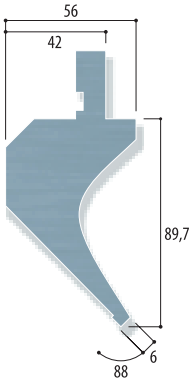
30 T/m	
R = 0,2	
SG1024881	835
SG1024882	415
SG1024883	SCT



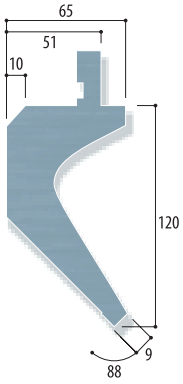
20 T/m	
R = 0,2	
SG1026881	835
SG1026882	415
SG1026883	SCT



50 T/m	
R = 0,2	
SG1046881	835
SG1046882	415
SG1046883	SCT



50 T/m	
R = 0,2	
SG1047881	835
SG1047882	415
SG1047883	SCT



SYSTEM TOOLING

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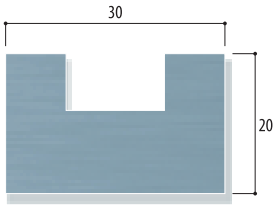
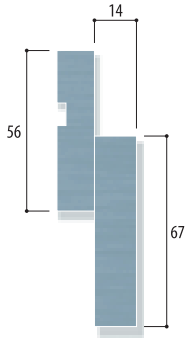
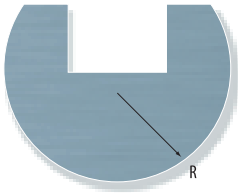
100 T/m	
SG40021	835
SG40022	415
-	SCT



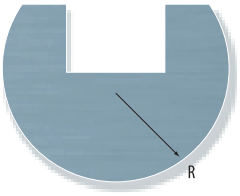
100 T/m	
SG40051	835
SG40052	415
-	SCT



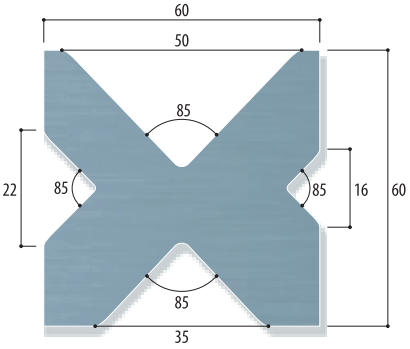
100 T/m	
R = 10	
SG4009101	835
SG4009102	415
-	SCT
R = 15	
SG4009151	835
SG4009152	415
-	SCT



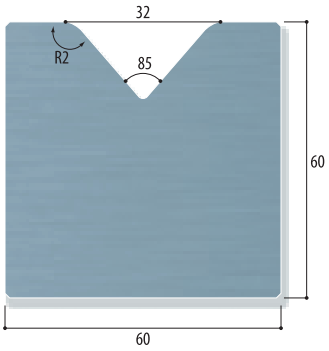
100 T/m	
R = 20	
SG4009201	835
SG4009202	415
-	SCT
R = 25	
SG4009251	835
SG4009252	415
-	SCT
R = 30	
SG4009301	835
SG4009302	415
-	SCT



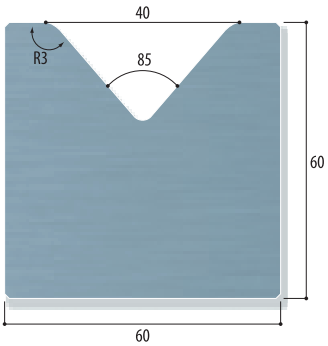
100 T/m	✶
S20091	835
S20092	415
-	SCT



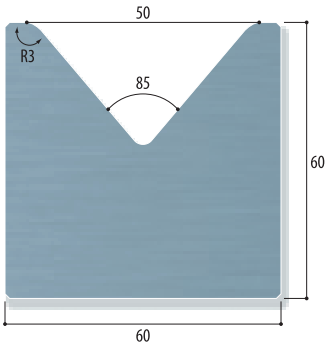
100 T/m	
S2011321	835
S2011322	415
-	SCT



100 T/m	
S2011401	835
S2011402	415
-	SCT



100 T/m	
S2011501	835
S2011502	415
-	SCT



✶ = ex stock

SYSTEM TOOLING

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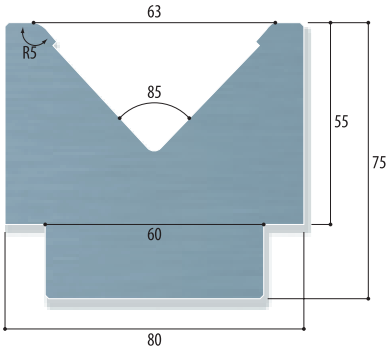
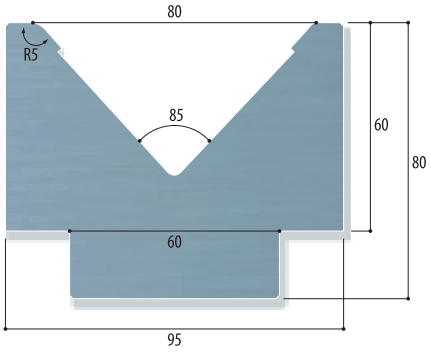
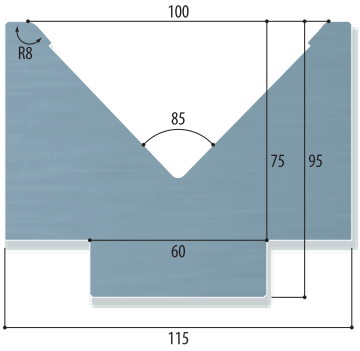
100 T/m	
S2011631	835
S2011632	415
-	SCT



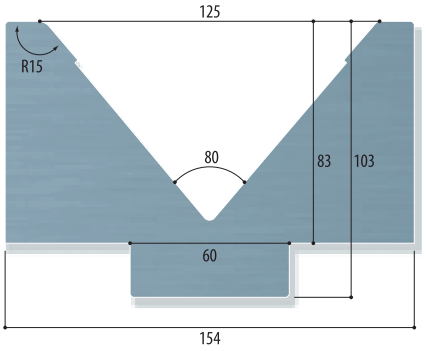
100 T/m	
S2011801	835
S2011802	415
-	SCT



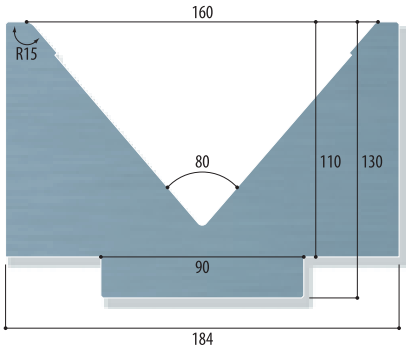
100 T/m	
S20111001	835
S20111002	415
-	SCT



100 T/m	
S20111251	835
S20111252	415
-	SCT

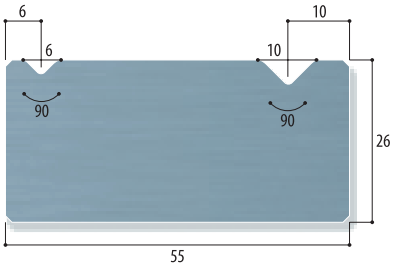


S20111601	835
S20111602	415
-	SCT



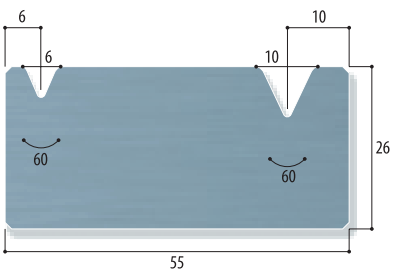
80 T/m	
S2012901	835
S2012902	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)



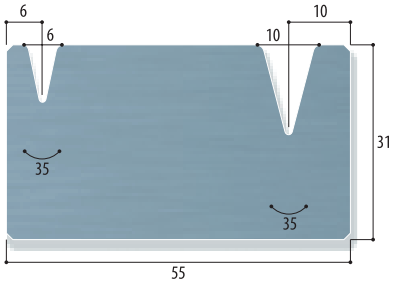
80 T/m	
S2012601	835
S2012602	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)



30 T/m	
S2012351	835
S2012352	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)



SYSTEM TOOLING

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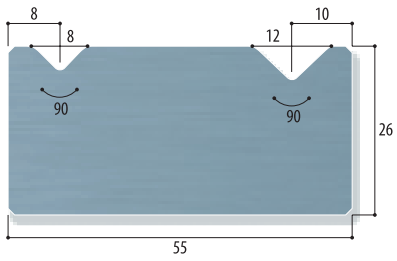
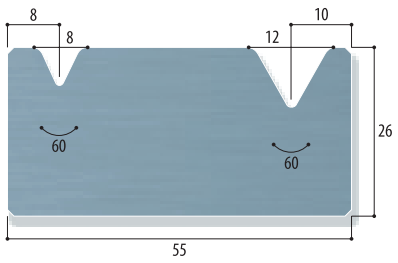
100 T/m	
S2013901	835
S2013902	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)



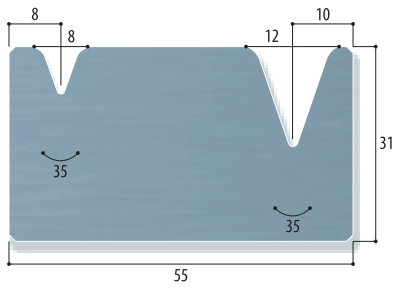
80 T/m	
S2013601	835
S2013602	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)



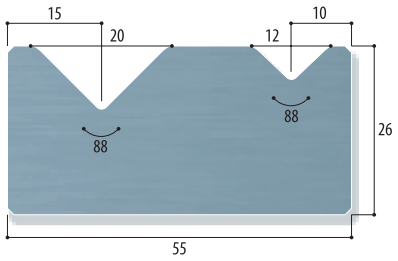
30 T/m	
S2013351	835
S2013352	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)



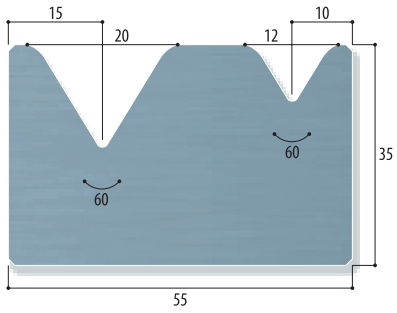
100 T/m	
S2014881	835
S2014882	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)



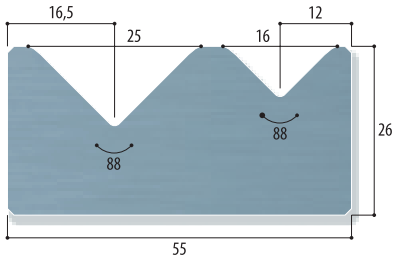
80 T/m	
S2014601	835
S2014602	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)



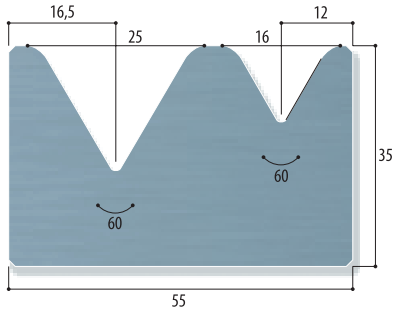
80 T/m	
S2015881	835
S2015882	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)

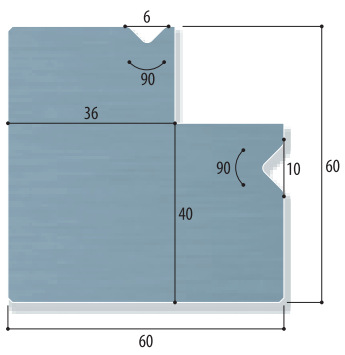


80 T/m	
S2015601	835
S2015602	415
-	SCT

Needs support beam dies (ref. S4006… or S4007…)



70 T/m	
S2016901	835
S2016902	415
-	SCT



SYSTEM TOOLING

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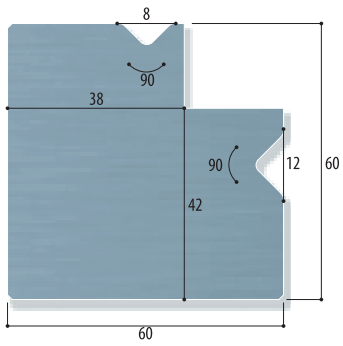
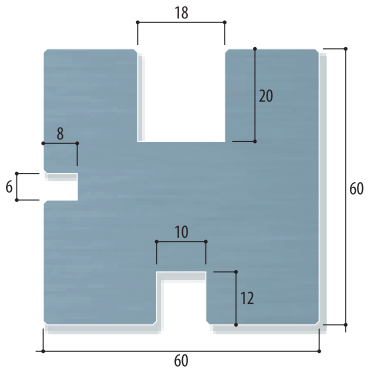
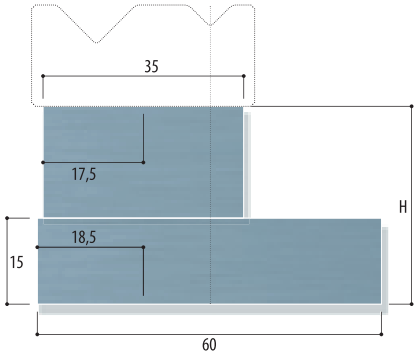
70 T/m	
S2017901	835
S2017902	415
-	SCT



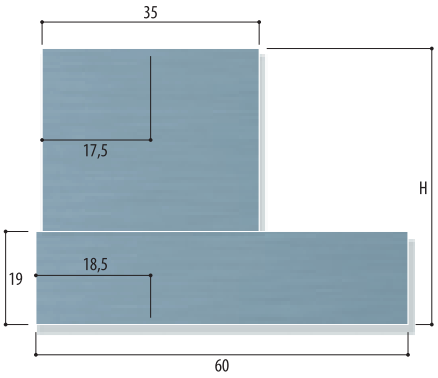
100 T/m	
S20081	835
S20082	415
-	SCT



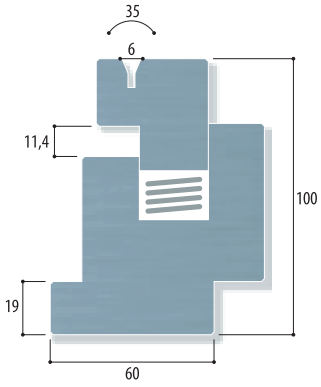
100 T/m	
H = 34	
S400611	835
S400612	415
-	SCT
H = 39	
S400621	835
S400622	415
-	SCT



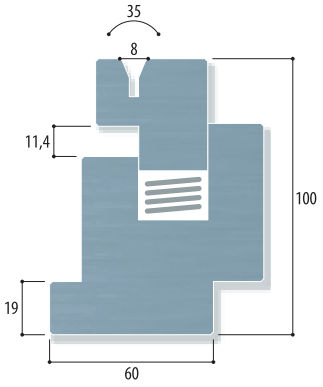
100 T/m	
H = 45	
S400711	835
S400712	415
-	SCT
H = 55	
S400721	835
S400722	415
-	SCT



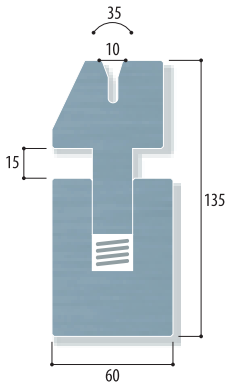
60 T/m	
S300161	835
S300162	415
-	SCT



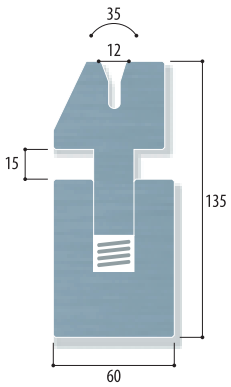
60 T/m	
S300181	835
S300182	415
-	SCT



65 T/m	
S3001101	835
S3001102	415
-	SCT



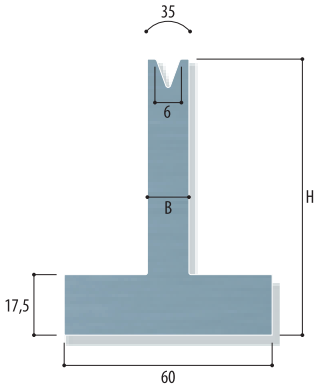
65 T/m	
S3001121	835
S3001122	415
-	SCT



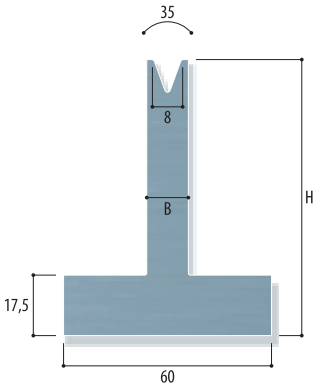
SYSTEM TOOLING

for impressive performances

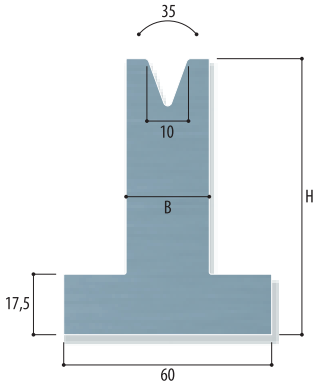
35 T/m	
H = 80	
B = 12	
S203561L	835
S203562L	415
S203563L	SCT
H = 120	
B = 14	
S203561H	835
S203562H	415
S203563H	SCT



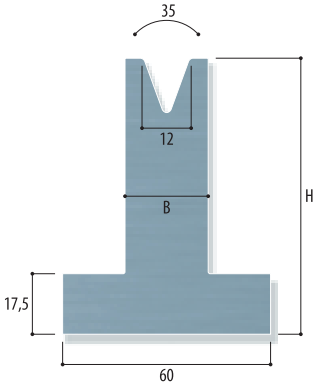
35 T/m	
H = 80	
B = 12	
S203581L	835
S203582L	415
S203583L	SCT
H = 120	
B = 16	
S203581H	835
S203582H	415
S203583H	SCT



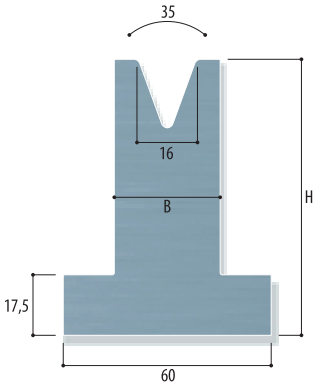
50 T/m	
H = 80	
B = 24	
S2035101L	835
S2035102L	415
S2035103L	SCT
H = 120	
B = 14	
S2035101H	835
S2035102H	415
S2035103H	SCT



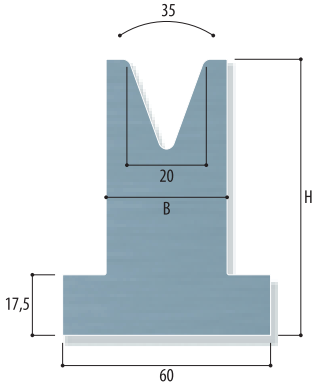
40 T/m	
H = 80	
B = 24	
S2035121L	835
S2035122L	415
S2035123L	SCT
H = 120	
B = 24	
S2035121H	835
S2035122H	415
S2035123H	SCT



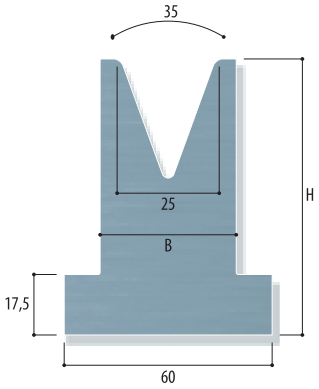
45 T/m	
H = 80	
B = 30	
S2035161L	835
S2035162L	415
S2035163L	SCT
H = 120	
B = 30	
S2035161H	835
S2035162H	415
S2035163H	SCT



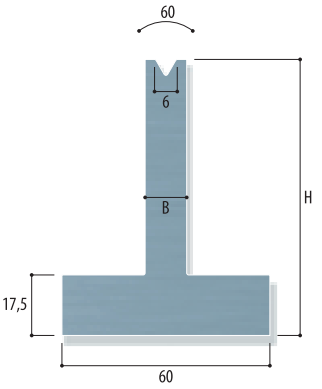
50 T/m	
H = 80	
B = 35	
S2035201L	835
S2035202L	415
S2035203L	SCT
H = 120	
B = 35	
S2035201H	835
S2035202H	415
S2035203H	SCT



50 T/m	
H = 80	
B = 40	
S2035251L	835
S2035252L	415
S2035253L	SCT
H = 120	
B = 40	
S2035251H	835
S2035252H	415
S2035253H	SCT



60 T/m	
H = 80	
B = 12	
S206061L	835
S206062L	415
S206063L	SCT
H = 120	
B = 14	
S206061H	835
S206062H	415
S206063H	SCT



SYSTEM TOOLING

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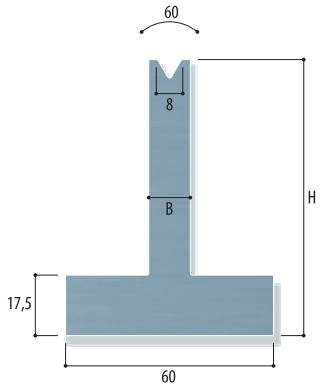
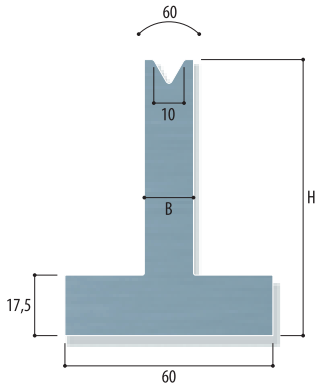
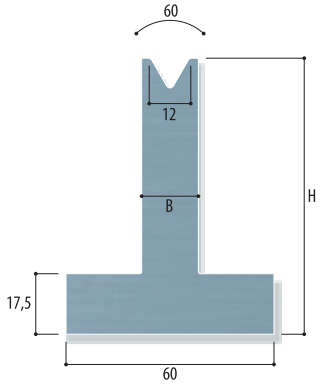
60 T/m	
H = 80	
B = 12	
S206081L	835
S206082L	415
S206083L	SCT
H = 120	
B = 14	
S206081H	835
S206082H	415
S206083H	SCT



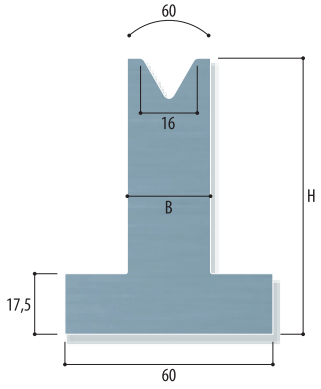
60 T/m	
H = 80	
B = 14	
S2060101L	835
S2060102L	415
S2060103L	SCT
H = 120	
B = 18	
S2060101H	835
S2060102H	415
S2060103H	SCT



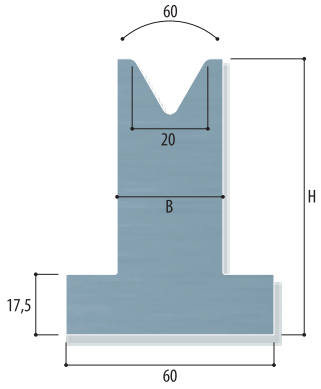
60 T/m	
H = 80	
B = 16	
S2060121L	835
S2060122L	415
S2060123L	SCT
H = 120	
B = 18	
S2060121H	835
S2060122H	415
S2060123H	SCT



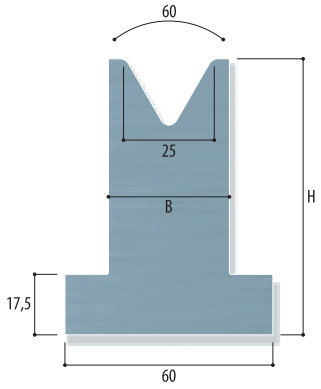
60 T/m	
H = 80	
B = 24	
S2060161L	835
S2060162L	415
S2060163L	SCT
H = 120	
B = 24	
S2060161H	835
S2060162H	415
S2060163H	SCT



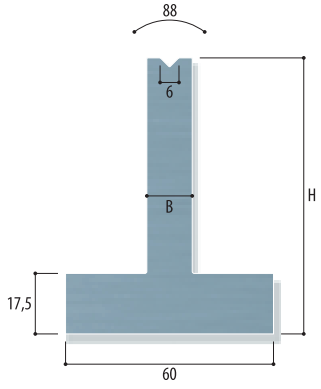
60 T/m	
H = 80	
B = 30	
S2060201L	835
S2060202L	415
S2060203L	SCT
H = 120	
B = 30	
S2060201H	835
S2060202H	415
S2060203H	SCT



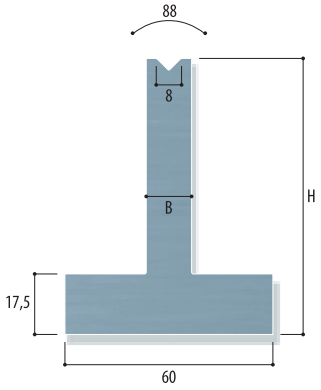
60 T/m	
H = 80	
B = 35	
S2060251L	835
S2060252L	415
S2060253L	SCT
H = 120	
B = 35	
S2060251H	835
S2060252H	415
S2060253H	SCT



100 T/m	
H = 80	
B = 12	
S208861L	835
S208862L	415
S208863L	SCT
H = 120	
B = 14	
S208861H	835
S208862H	415
S208863H	SCT



100 T/m	
H = 80	
B = 12	
S208881L	835
S208882L	415
S208883L	SCT
H = 120	
B = 18	
S208881H	835
S208882H	415
S208883H	SCT



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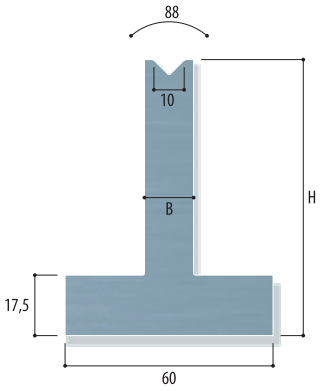
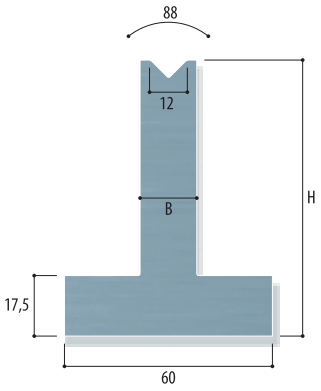
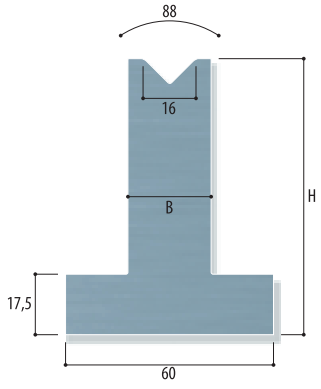
100 T/m	
H = 80	
B = 14	
S2088101L	835
S2088102L	415
S2088103L	SCT
H = 120	
B = 18	
S2088101H	835
S2088102H	415
S2088103H	SCT



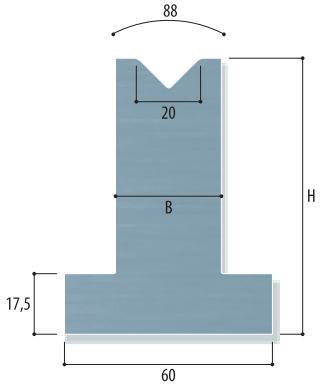
100 T/m	
H = 80	
B = 16	
S2088121L	835
S2088122L	415
S2088123L	SCT
H = 120	
B = 18	
S2088121H	835
S2088122H	415
S2088123H	SCT



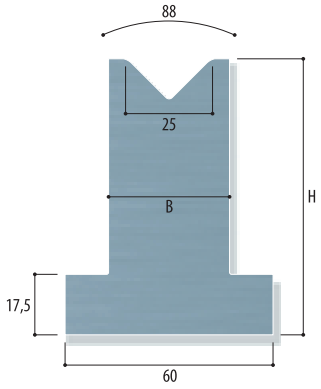
100 T/m	
H = 80	
B = 24	
S2088161L	835
S2088162L	415
S2088163L	SCT
H = 120	
B = 24	
S2088161H	835
S2088162H	415
S2088163H	SCT



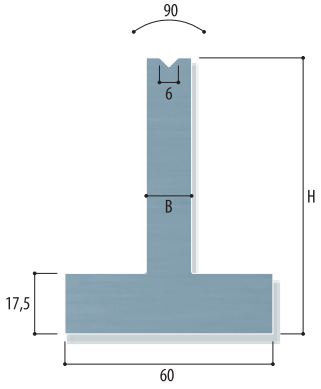
100 T/m	
H = 80	
B = 30	
S2088201L	835
S2088202L	415
S2088203L	SCT
H = 120	
B = 30	
S2088201H	835
S2088202H	415
S2088203H	SCT



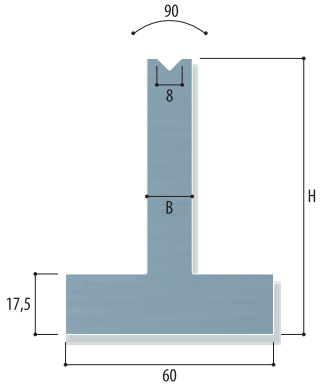
100 T/m	
H = 80	
B = 35	
S2088251L	835
S2088252L	415
S2088253L	SCT
H = 120	
B = 35	
S2088251H	835
S2088252H	415
S2088253H	SCT



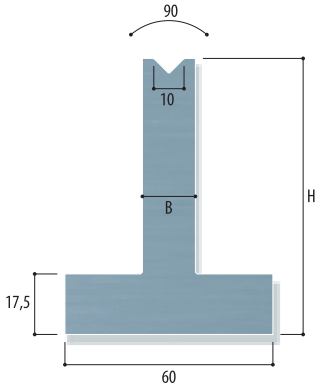
100 T/m	
H = 80	
B = 12	
S209061L	835
S209062L	415
S209063L	SCT
H = 120	
B = 14	
S209061H	835
S209062H	415
S209063H	SCT



100 T/m	
H = 80	
B = 12	
S209081L	835
S209082L	415
S209083L	SCT
H = 120	
B = 14	
S209081H	835
S209082H	415
S209083H	SCT



100 T/m	
H = 80	
B = 14	
S2090101L	835
S2090102L	415
S2090103L	SCT
H = 120	
B = 18	
S2090101H	835
S2090102H	415
S2090103H	SCT



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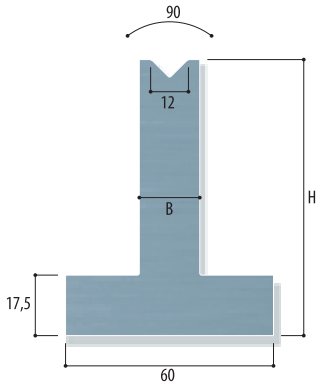
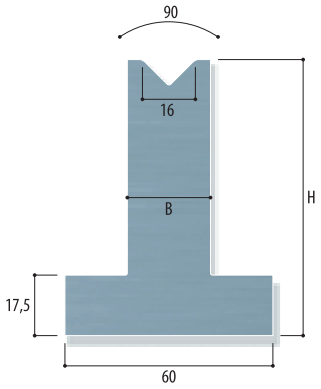
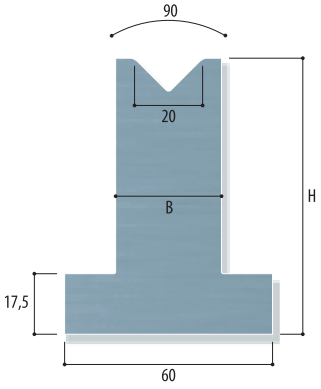
100 T/m	
H = 80	
B = 16	
S2090121L	835
S2090122L	415
S2090123L	SCT
H = 120	
B = 24	
S2090121H	835
S2090122H	415
S2090123H	SCT



100 T/m	
H = 80	
B = 24	
S2090161L	835
S2090162L	415
S2090163L	SCT
H = 120	
B = 24	
S2090161H	835
S2090162H	415
S2090163H	SCT



100 T/m	
H = 80	
B = 30	
S2090201L	835
S2090202L	415
S2090203L	SCT
H = 120	
B = 30	
S2090201H	835
S2090202H	415
S2090203H	SCT



100 T/m	
H = 80	
B = 24	
S2090251L	835
S2090252L	415
S2090253L	SCT
H = 120	
B = 24	
S2090251H	835
S2090252H	415
S2090253H	SCT

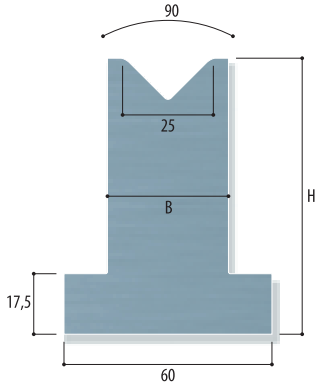


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FIGURE 21

A budget friendly tool system specifically designed for each machine capacity. The multi V-die combines flexibility by having different V-openings into 1 die and easy tool turning. The top bending tool is available in different versions: flexible gooseneck tool 86°, straight tools of 86, 30, 60 or 180°, in full length or sectionalised.

Haco tooling has the following characteristics:

- Tensile strength, Rm.....1000 - 1100 N/mm^2
- Dies have fine-planed shoulder-radii, are not hardened and not ground.
- Punches have a fine-planed tip, are not hardened and not ground.
- Punches and dies are not interchangeable.
- Punches and dies are available in accordance with the machine bending length, that is:
  1600 mm, 2100 mm, 2600 mm, 3100 mm, 3600 mm, 4100 mm, 4300 mm, 5000 mm, 6000 mm, 7000 mm and 8000 mm.

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The dimensions for the clamping of Haco tools depend on the tonnage of the pressbrake.
Following dimensions are valid:

Capacity < 150 T

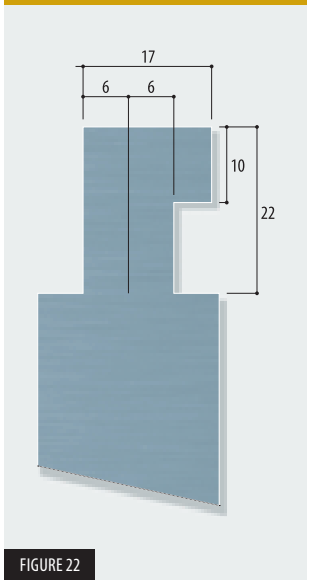


FIGURE 22

175 T ≤ capacity ≤ 260 T

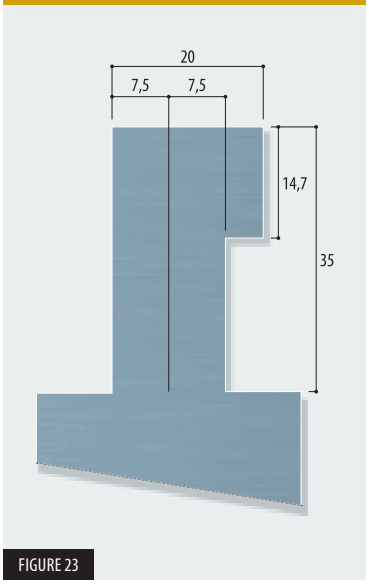


FIGURE 23

300 T ≤ capacity ≤ 400 T

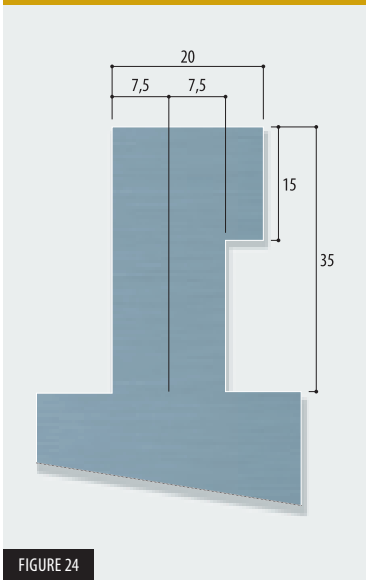


FIGURE 24

500 T ≤ capacity ≤ 600 T

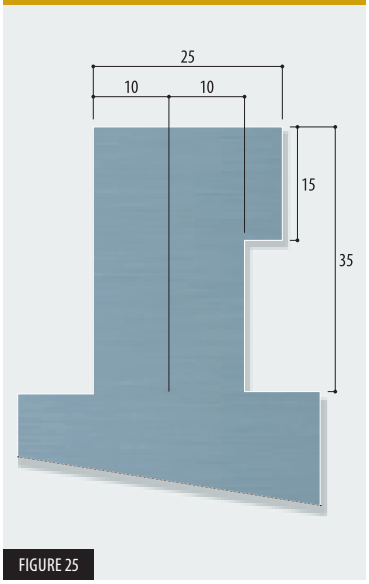


FIGURE 25

Tooling for pressbrakes with a capacity over 600 tons are available on request. In addition to the standard tooling shown in this catalogue, tooling can be supplied to suit the customers specific requirements, details are available on request.

Haco punches are available with standard cutting, starting with a minimum bending length of 2100 mm.

reference	constituing lengths	total length
PCUT 32	35 + 40 + 45 + 50 + 55 + 60 + 70 + 100 + 200 + 400 + 800 + rest	1855 + rest
PCUT 40	35 + 40 + 45 + 50 + 55 + 60 + 70 + 100 + 200 + 400 + 800 + 1000 + 1000 + rest	3855 + rest

On request, Haco–punches can be subdivided in different lengths according to the wishes of the customer. For each cut you need to calculate a loss of about 5 mm.

FIGURE 26

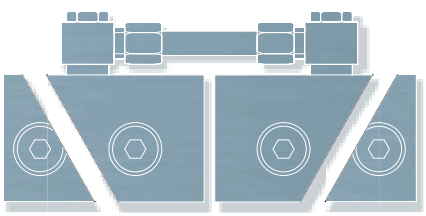
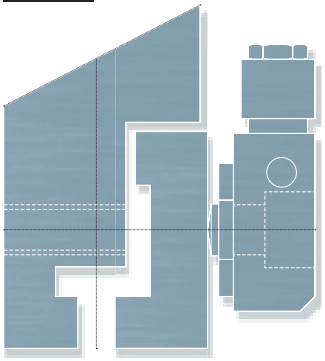


FIGURE 27



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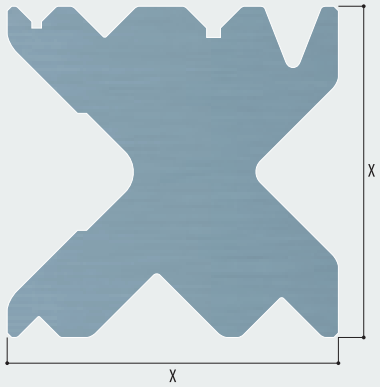
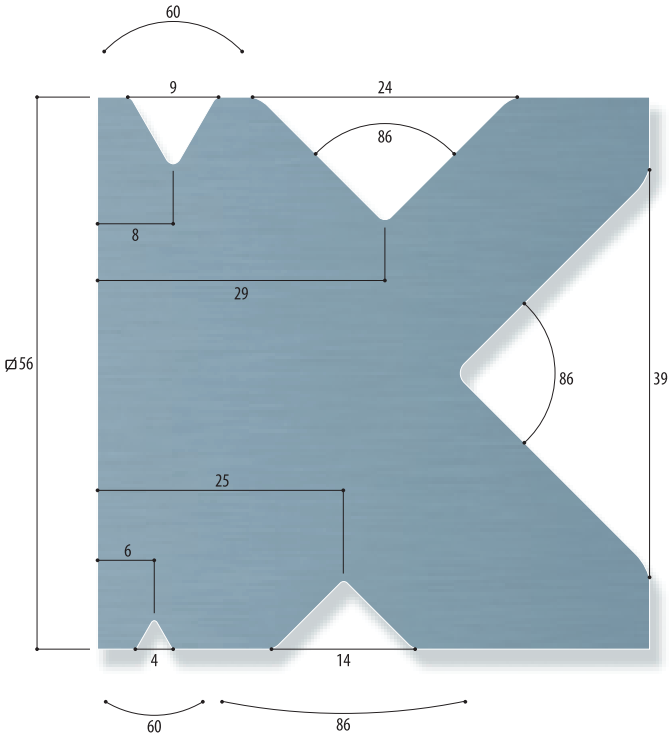
V-OPENING (mm)																										X (mm)
SERIE	4	9	9,5	10	12	13	14	15	16	19	20	22	24	25	32	35	38	39	40	50	52	55	60	76	80	120	160	(figure 26)
400 kN	•	•					•						•					•										56
600 - 750 kN		•			•			•					•			•												70
1100 - 1500 kN				•				•	•						•							•						90
1750 - 2600 kN			•			•			•	•				•			•				•			•				100
3000 - 4000 kN											•		•		•				•				•		•			125
5000 - 6000 kN				•								•			•					•					•	•		160
7000 - 10000 kN																			•				•			•	•	200

FIGURE 28



DIE	
40 T	
order number	length
PV5615	1600
PV5620	2100
PV5625	2600



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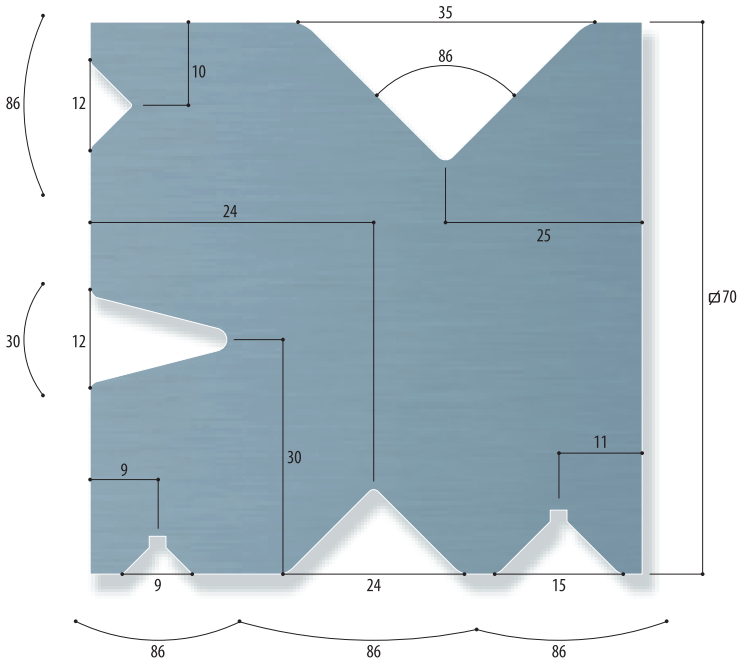
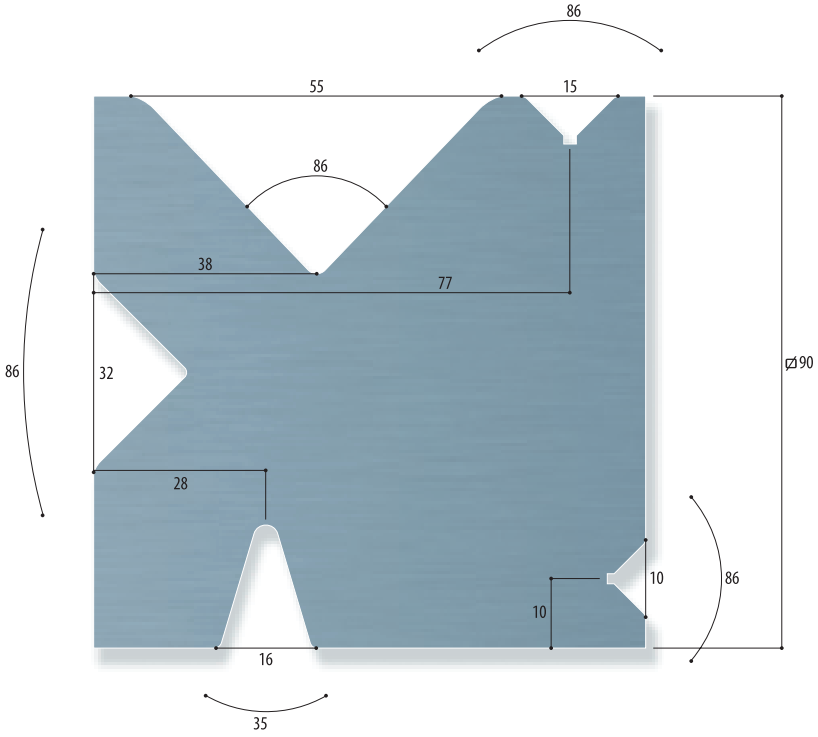
DIE	
60 - 75 T	✶
order number	length
PV7020	2100
PV7025	2600
PV7030	3100



DIE	
100 - 150 T	✶
order number	length
PV9020	2100
PV9025	2600
PV9030	3100
PV9035	3600
PV9040	4100
PV9043	4300



✶ = ex stock

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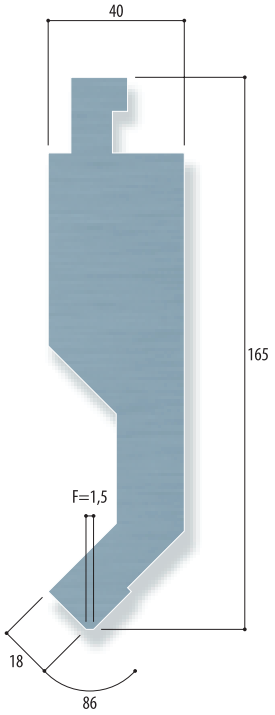
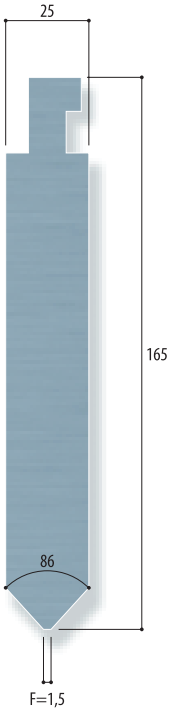
PUNCH

60 - 150 T	✶
order number	length
P110C 20	2100
P110C 25	2600
P110C 30	3100
P110C 35	3600
P110C 40	4100
P110C 43	4300



PUNCH

60 - 150 T	✶
order number	length
P11090 20	2100
P11090 25	2600
P11090 30	3100
P11090 35	3600
P11090 40	4100
P11090 43	4300



✶ = ex stock

HACO TOOLING

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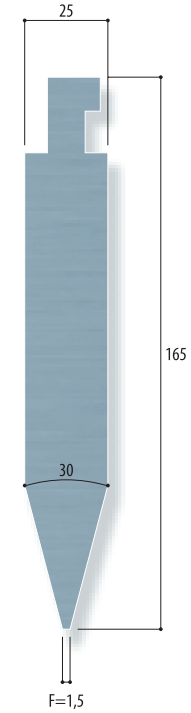
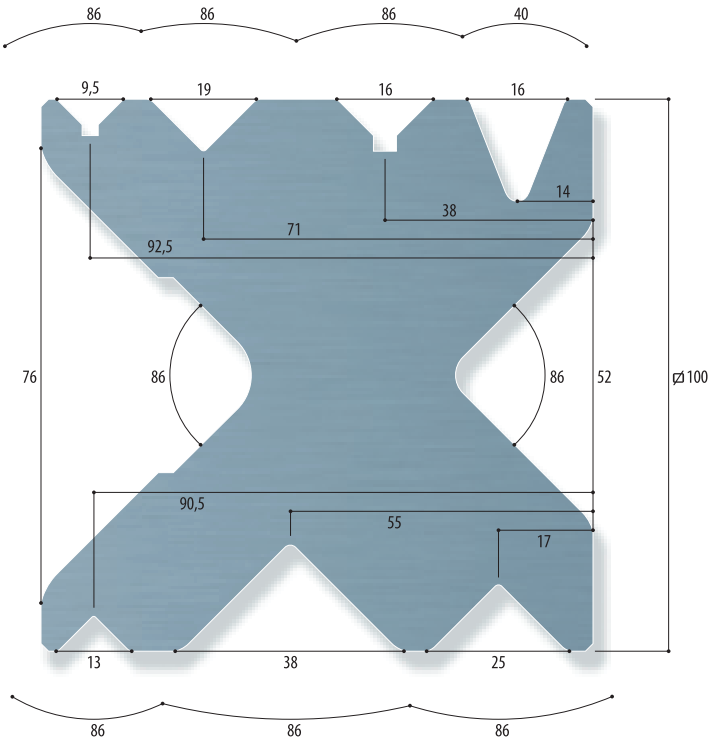
PUNCH

60 - 150 T ✶	
order number	length
P11030 20	2100
P11030 25	2600
P11030 30	3100
P11030 35	3600
P11030 40	4100
P11030 43	4300



DIE

175 - 260 T ✶	
order number	length
PV100 25	2600
PV100 30	3100
PV100 35	3600
PV100 40	4100
PV100 43	4300
PV100 50	5000
PV100 60	6000



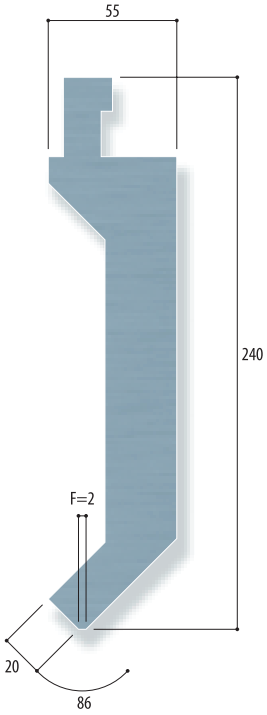
✶ = ex stock

HACO TOOLING

for impressive performances

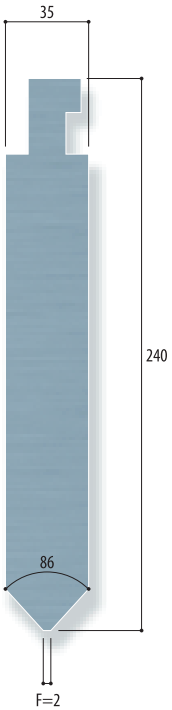
PUNCH

175 - 260 T ★	
order number	length
P200C 25	2600
P200C 30	3100
P200C 35	3600
P200C 40	4100
P200C 43	4300
P200C 50	5000
P200C 60	6000



PUNCH

175 - 260 T ★	
order number	length
P20090 25	2600
P20090 30	3100
P20090 35	3600
P20090 40	4100
P20090 43	4300
P20090 50	5000
P20090 60	6000



★ = ex stock

HACO TOOLING

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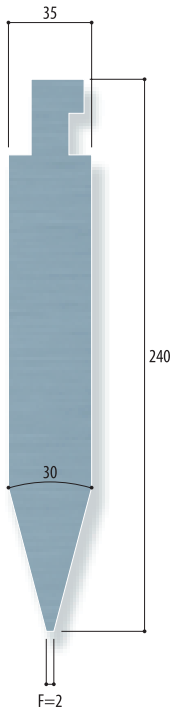
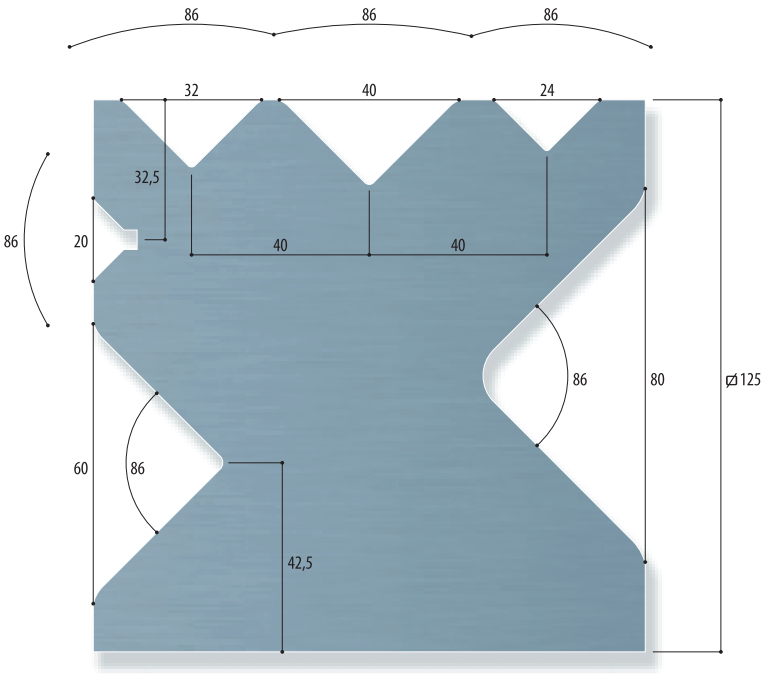
PUNCH	
175 - 260 T	✶
order number	length
P20030 25	2600
P20030 30	3100
P20030 35	3600
P20030 40	4100
P20030 43	4300
P20030 50	5000
P20030 60	6000



DIE	
300 - 400 T	✶
order number	length
PV125 30	3100
PV125 35	3600
PV125 40	4100
PV125 43	4300
PV125 50	5000
PV125 60	6000
PV125 70	7000
PV125 80	8000



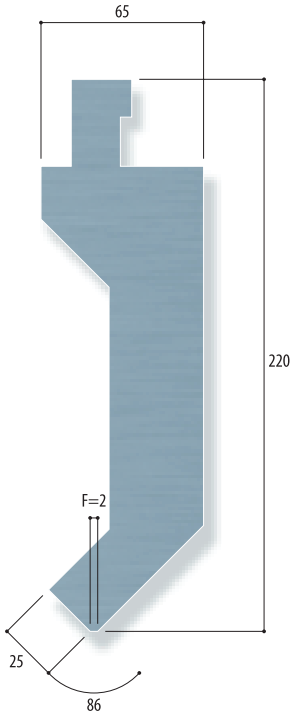
✶ = ex stock

HACO TOOLING

for impressive performances

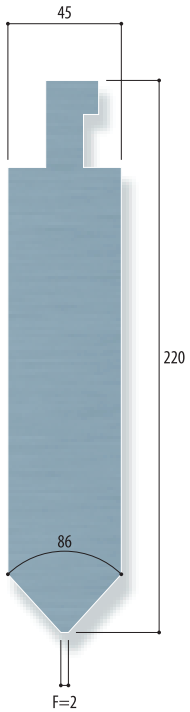
PUNCH

300 - 400 T ★	
order number	length
P400C 30	3100
P400C 35	3600
P400C 40	4100
P400C 43	4300
P400C 50	5000
P400C 60	6000
P400C 70	7000
P400C 80	8000



PUNCH

300 - 400 T ★	
order number	length
P40090 30	3100
P40090 35	3600
P40090 40	4100
P40090 43	4300
P40090 50	5000
P40090 60	6000
P40090 70	7000
P40090 80	8000



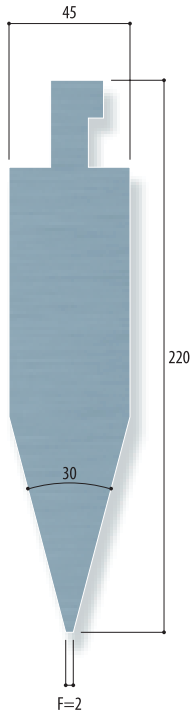
★ = ex stock

HACO TOOLING

for impressive performances

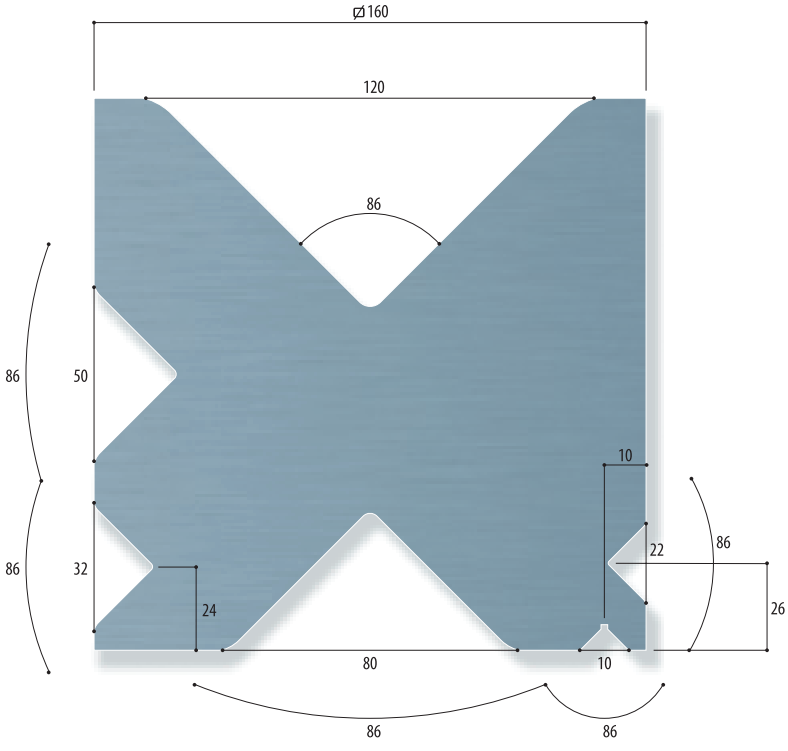
PUNCH

300 - 400 T	✶
order number	length
P40030 30	3100
P40030 35	3600
P40030 40	4100
P40030 43	4300
P40030 50	5000
P40030 60	6000
P40030 70	7000
P40030 80	8000



DIE

500 - 600 T	
order number	length
PV160 30	3100
PV160 40	4100
PV160 50	5000
PV160 60	6000
PV160 70	7000
PV160 80	8000



✶ = ex stock

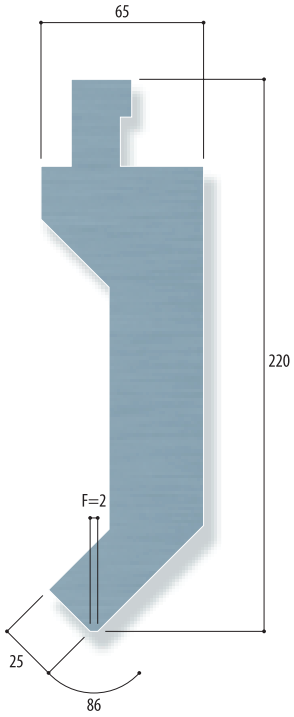
HACO TOOLING

for impressive performances

PUNCH

500 - 600 T

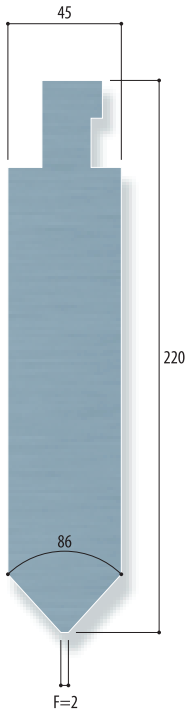
order number	length
P600C 30	3100
P600C 40	4100
P600C 50	5000
P600C 60	6000
P600C 70	7000
P600C 80	8000



PUNCH

500 - 600 T

order number	length
P60090 30	3100
P60090 40	4100
P60090 50	5000
P60090 60	6000
P60090 70	7000
P60090 80	8000



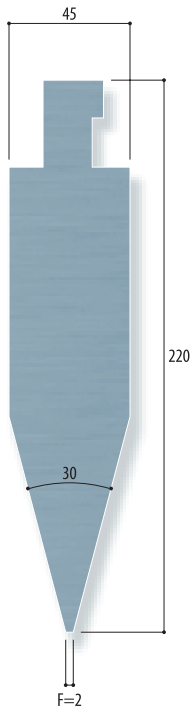
HACO TOOLING

for impressive performances

PUNCH

500 - 600 T

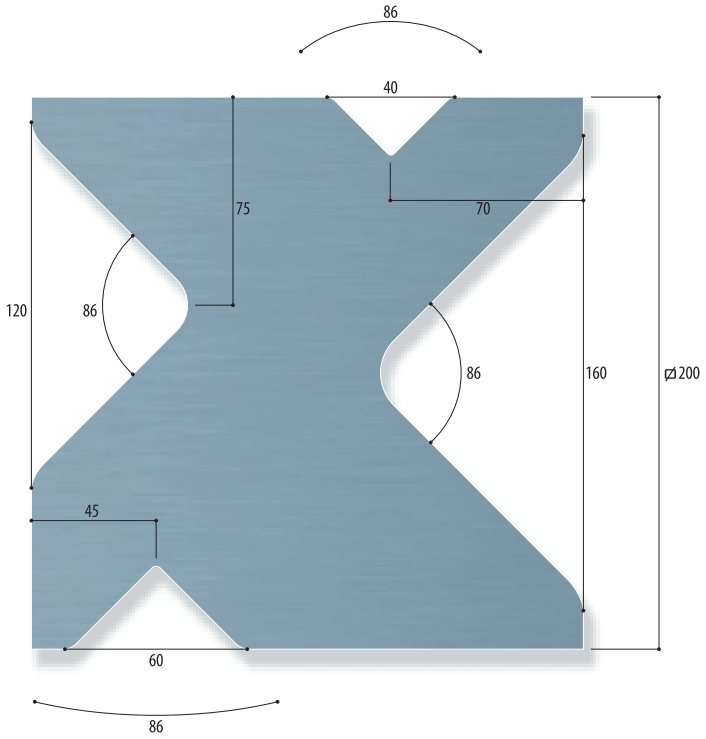
order number	length
P60030 30	3100
P60030 40	4100
P60030 50	5000
P60030 60	6000
P60030 70	7000
P60030 80	8000



DIE

700 - 1000 T

order number	length
PV200 40	4100
PV200 50	5000
PV200 60	6000
PV200 70	7000
PV200 80	8000



SINGLE-V DIES

for impressive performances

FIGURE 29

Single V-dies are available in a large variety of angles and V-openings. The small width/height ratio allows an improved access for the workpiece around the die. Single V-die clamping is using a groove in either a Haco or a System tool table. By using the groove as a self alignment system, the tool change can be reduced to very little time.

Single V-dies have the following characteristics:

- Material ..... C 50
- Shoulder radii are hardened and ground ..... 52 à 58 HRC
- Single-V dies are available in lengths of 500, 1000 and 1100 mm and can be delivered according to the pressbrake bending-length:
  1600 mm = (1 x 1100 mm) + (1 x 500 mm)
  2100 mm = (1 x 1100 mm) + (1 x 1000 mm)
  2600 mm = (1 x 1100 mm) + (1 x 1000 mm) + (1 x 500 mm)
  3100 mm = (1 x 1100 mm) + (2 x 1000 mm)
  3600 mm = (1 x 1100 mm) + (2 x 1000 mm) + (1 x 500 mm)
  4100 mm = (1 x 1100 mm) + (3 x 1000 mm)
  4300 mm = (3 x 1100 mm) + (1 x 1000 mm)
  5000 mm = (5 x 1000 mm)
  6000 mm = (6 x 1000 mm)
- In order to clamp Single-V dies, the table must be equipped with a groove.
- When there is no groove available or when using a table suitable for Haco tooling, an optional fillerblock for Single V-dies (figure 18) can be used. When using this fillerblock, one has to keep in mind that the daylight-opening decreases by 30 mm.
- The dies can be divided into different groups according to the range of the V-opening. Within a certain group, the V-opening can be chosen between a minimum and a maximum value. Each tool is made with a V-opening according to the customers requirement. So, when ordering Single-V dies, do not forget to mention the opening required.
- Certain dies can be delivered with an angle of 86° or 88°. Please indicate the required angle when ordering.
- Single-V dies can be sectionalised when necessary – information is available on request.

Fillerblock for single-v dies.

The fillerblock can be used when a groove for Single-V dies is not present on the pressbrake-table. The fillerblock is manufactured in one full length and needs to be centered by means of positioning screws.

FIGURE 30

FB16 1600
FB20 2100
FB25 2600
FB30 3100
FB36 3600
FB40 4100
FB43 4300
FB50 5000
FB60 6000

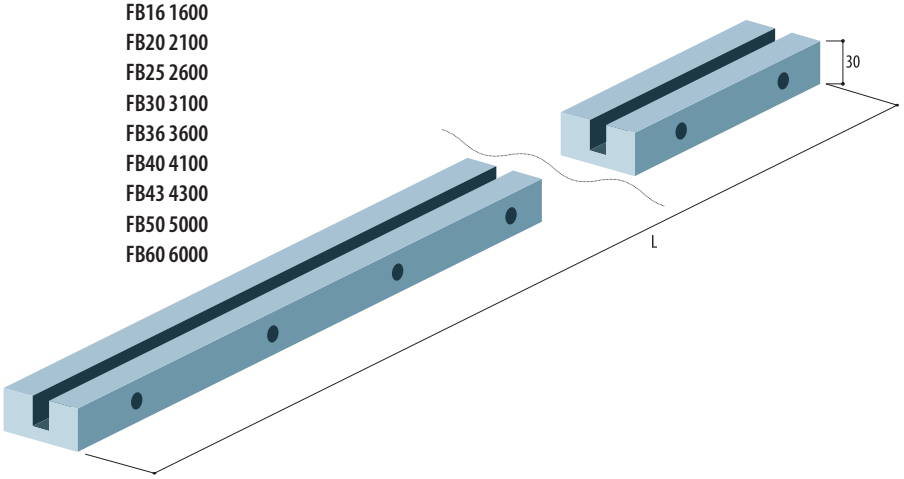
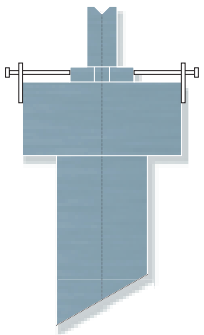


FIGURE 31

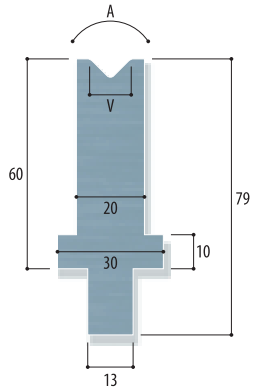


Remark: positioning screws are not included.

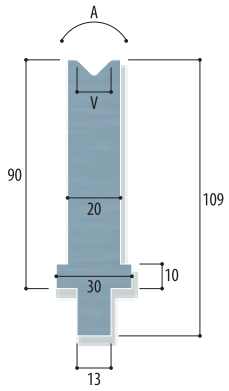
SINGLE-V DIES

for impressive performances

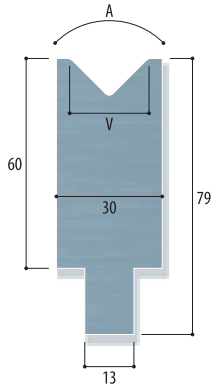
90 T/m V = 6-15 A = 86° / 88°	
OZVA16/V/A/L	1600
OZVA20/V/A/L	2100
OZVA25/V/A/L	2600
OZVA30/V/A/L	3100
OZVA35/V/A/L	3600
OZVA40/V/A/L	4100
OZVA43/V/A/L	4300
OZVA50/V/A/L	5000
OZVA60/V/A/L	6000



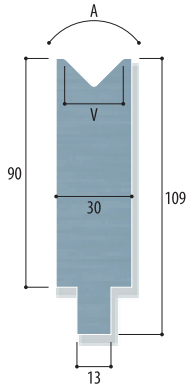
90 T/m V = 6-15 A = 86° / 88°	
OZVA16/V/A/H	1600
OZVA20/V/A/H	2100
OZVA25/V/A/H	2600
OZVA30/V/A/H	3100
OZVA35/V/A/H	3600
OZVA40/V/A/H	4100
OZVA43/V/A/H	4300
OZVA50/V/A/H	5000
OZVA60/V/A/H	6000



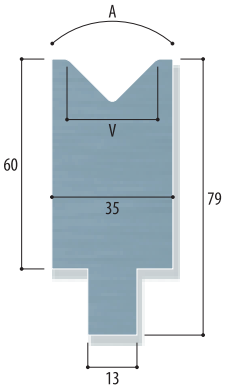
90 T/m V = 6-23 A = 86° / 88°	
OZVA16/V/A/L	1600
OZVA20/V/A/L	2100
OZVA25/V/A/L	2600
OZVA30/V/A/L	3100
OZVA35/V/A/L	3600
OZVA40/V/A/L	4100
OZVA43/V/A/L	4300
OZVA50/V/A/L	5000
OZVA60/V/A/L	6000



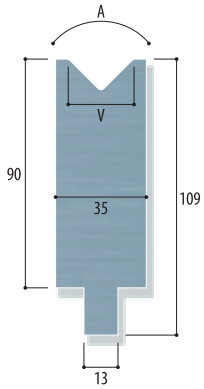
90 T/m V = 6-23 A = 86° / 88°	
OZVA16/V/A/H	1600
OZVA20/V/A/H	2100
OZVA25/V/A/H	2600
OZVA30/V/A/H	3100
OZVA35/V/A/H	3600
OZVA40/V/A/H	4100
OZVA43/V/A/H	4300
OZVA50/V/A/H	5000
OZVA60/V/A/H	6000



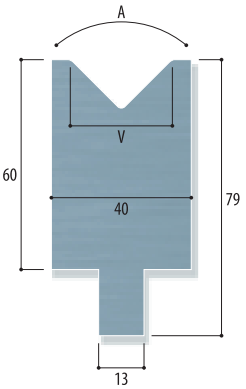
90 T/m V = 24-29 A = 86° / 88°	
OZVA16/V/A/L	1600
OZVA20/V/A/L	2100
OZVA25/V/A/L	2600
OZVA30/V/A/L	3100
OZVA35/V/A/L	3600
OZVA40/V/A/L	4100
OZVA43/V/A/L	4300
OZVA50/V/A/L	5000
OZVA60/V/A/L	6000



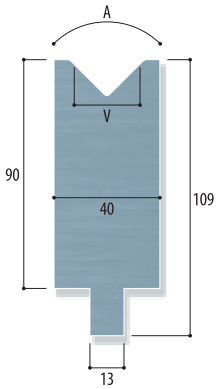
90 T/m V = 24-29 A = 86° / 88°	
OZVA16/V/A/H	1600
OZVA20/V/A/H	2100
OZVA25/V/A/H	2600
OZVA30/V/A/H	3100
OZVA35/V/A/H	3600
OZVA40/V/A/H	4100
OZVA43/V/A/H	4300
OZVA50/V/A/H	5000
OZVA60/V/A/H	6000



90 T/m V = 30-34 A = 86° / 88°	
OZVA16/V/A/L	1600
OZVA20/V/A/L	2100
OZVA25/V/A/L	2600
OZVA30/V/A/L	3100
OZVA35/V/A/L	3600
OZVA40/V/A/L	4100
OZVA43/V/A/L	4300
OZVA50/V/A/L	5000
OZVA60/V/A/L	6000



90 T/m V = 30-34 A = 86° / 88°	
OZVA16/V/A/H	1600
OZVA20/V/A/H	2100
OZVA25/V/A/H	2600
OZVA30/V/A/H	3100
OZVA35/V/A/H	3600
OZVA40/V/A/H	4100
OZVA43/V/A/H	4300
OZVA50/V/A/H	5000
OZVA60/V/A/H	6000



SINGLE-V DIES

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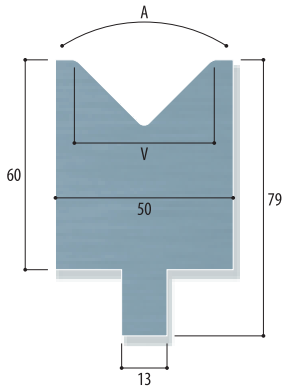
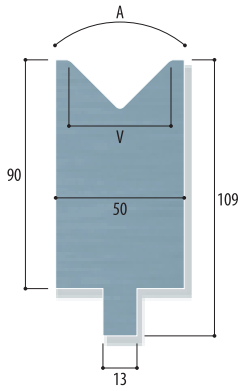
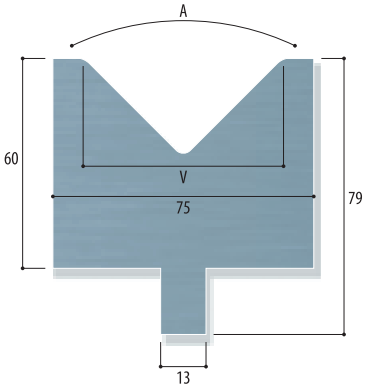
90 T/m V = 35-44 A = 86° / 88°	
OZVA16/V/A/L	1600
OZVA20/V/A/L	2100
OZVA25/V/A/L	2600
OZVA30/V/A/L	3100
OZVA35/V/A/L	3600
OZVA40/V/A/L	4100
OZVA43/V/A/L	4300
OZVA50/V/A/L	5000
OZVA60/V/A/L	6000



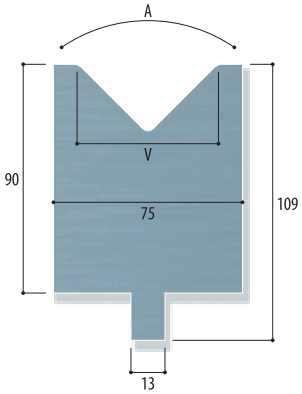
90 T/m V = 35-44 A = 86° / 88°	
OZVA16/V/A/H	1600
OZVA20/V/A/H	2100
OZVA25/V/A/H	2600
OZVA30/V/A/H	3100
OZVA35/V/A/H	3600
OZVA40/V/A/H	4100
OZVA43/V/A/H	4300
OZVA50/V/A/H	5000
OZVA60/V/A/H	6000



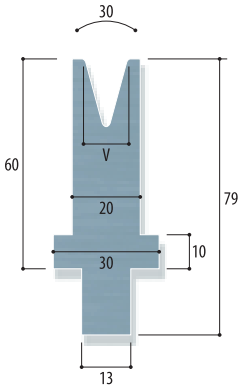
90 T/m V = 45-59 A = 86° / 88°	
OZVA16/V/A/L	1600
OZVA20/V/A/L	2100
OZVA25/V/A/L	2600
OZVA30/V/A/L	3100
OZVA35/V/A/L	3600
OZVA40/V/A/L	4100
OZVA43/V/A/L	4300
OZVA50/V/A/L	5000
OZVA60/V/A/L	6000



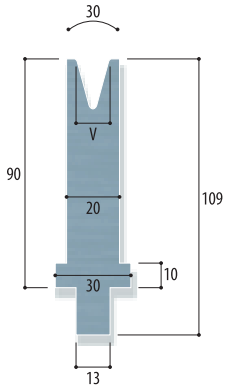
90 T/m V = 45-59 A = 86° / 88°	
OZVA16/V/A/H	1600
OZVA20/V/A/H	2100
OZVA25/V/A/H	2600
OZVA30/V/A/H	3100
OZVA35/V/A/H	3600
OZVA40/V/A/H	4100
OZVA43/V/A/H	4300
OZVA50/V/A/H	5000
OZVA60/V/A/H	6000



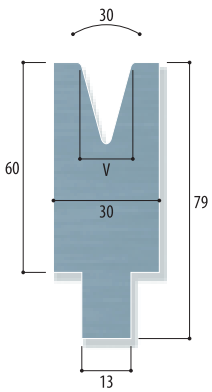
70 T/m V = 6-12 A = 30°	
OZVA16/V/A/L	1600
OZVA20/V/A/L	2100
OZVA25/V/A/L	2600
OZVA30/V/A/L	3100
OZVA35/V/A/L	3600
OZVA40/V/A/L	4100
OZVA43/V/A/L	4300
OZVA50/V/A/L	5000
OZVA60/V/A/L	6000



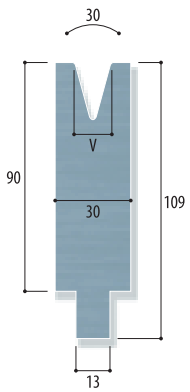
70 T/m V = 6-12 A = 30°	
OZVA16/V/A/H	1600
OZVA20/V/A/H	2100
OZVA25/V/A/H	2600
OZVA30/V/A/H	3100
OZVA35/V/A/H	3600
OZVA40/V/A/H	4100
OZVA43/V/A/H	4300
OZVA50/V/A/H	5000
OZVA60/V/A/H	6000



70 T/m V = 13-18 A = 30°	
OZVA16/V/A/L	1600
OZVA20/V/A/L	2100
OZVA25/V/A/L	2600
OZVA30/V/A/L	3100
OZVA35/V/A/L	3600
OZVA40/V/A/L	4100
OZVA43/V/A/L	4300
OZVA50/V/A/L	5000
OZVA60/V/A/L	6000



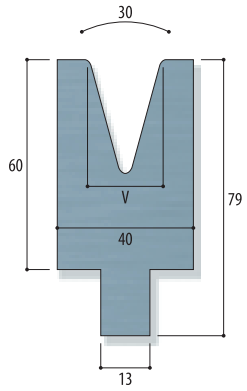
70 T/m V = 13-18 A = 30°	
OZVA16/V/A/H	1600
OZVA20/V/A/H	2100
OZVA25/V/A/H	2600
OZVA30/V/A/H	3100
OZVA35/V/A/H	3600
OZVA40/V/A/H	4100
OZVA43/V/A/H	4300
OZVA50/V/A/H	5000
OZVA60/V/A/H	6000



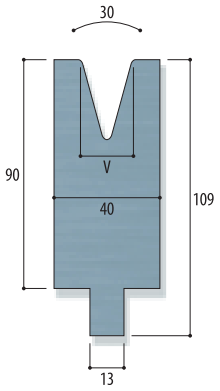
SINGLE-V DIES

for impressive performances

70 T/m V = 19-24 A = 30°	
OZVA16/V/A/L	1600
OZVA20/V/A/L	2100
OZVA25/V/A/L	2600
OZVA30/V/A/L	3100
OZVA35/V/A/L	3600
OZVA40/V/A/L	4100
OZVA43/V/A/L	4300
OZVA50/V/A/L	5000
OZVA60/V/A/L	6000



70 T/m V = 19-24 A = 30°	
OZVA16/V/A/H	1600
OZVA20/V/A/H	2100
OZVA25/V/A/H	2600
OZVA30/V/A/H	3100
OZVA35/V/A/H	3600
OZVA40/V/A/H	4100
OZVA43/V/A/H	4300
OZVA50/V/A/H	5000
OZVA60/V/A/H	6000



NEW STANDARD TOOLING

This system offers a high degree of accuracy, tool changing speed and flexibility. All 'New Standard' top and bottom tools are available in a wide range of heights and shapes. They all are manufactured to the smallest possible tolerances resulting in an optimal final bending accuracy. The top tools can be exchanged quickly and safely, vertically as well as horzontally. The self alignment of the dies by using the groove, avoids addittional press strokes, so it is possible to start bending operations immediately after tool-change.

New Standard tooling has the following characteristics:

- Material ..... special Cr-Mo
- Tensile strength, Rm. ..... 1000 - 1100 N/mm^2
- Dies have hardened and ground shoulder-radii ..... 55 à 60 HRC
- Punches have a hardened and ground tip ..... 55 à 60 HRC
- Punches and dies are available in following lengths:
  515 mm ..... xxx - xxx/1
  550 mm, sectionalised ..... xxx - xxx/2
  200 mm, sectionalised ..... xxx - xxx/3
- The BIU-type punches can only be clamped by means of the New Standard – manual or hydraulic – clamping system.
- The BIU-type punches with a weight under 12,5 kg are supplied with the safety quick-change system safety-click. From 12,5 kg and upwards, tooling is provided with a fixed security-pin.
- The OZU-type dies can be clamped on pressbrakes equipped with a groove for Single-V dies and all machines provided with a moducrown – manual or hydraulic – clamping system (table).
- When no groove is present or when using a table suited to take Haco dies, an optional filler block can be used. When using this fillerblock (figure 18, page 6), one has to keep in mind that the daylight-opening decreases by 30 mm.

NEW STANDARD TOOLING

for impressive performances

FIGURE 32

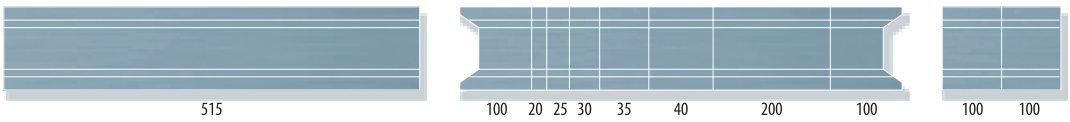
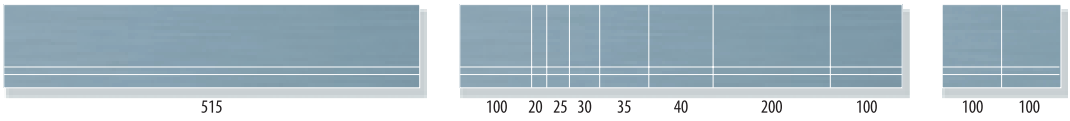


FIGURE 33



New standard upper-clamping.

By means of the New Standard system it is possible to clamp all New Standard BIU-type tools. The New Standard upper-clamping exists in both manual and hydraulic execution. With the manual version, the tooling can be centered and clamped by means of socket set screws. When using the hydraulic system, all tools will be lined up, clamped and centered by one single hit on a button. All units are available in accordance with the bending length and tonnage of the machine. Prices and extensive information is available on request. When more information is needed, never forget to mention the following:

- bending length of the pressbrake;
- tonnage;
- manual or hydraulic clamping.

FIGURE 34 New Standard system with manual clamping

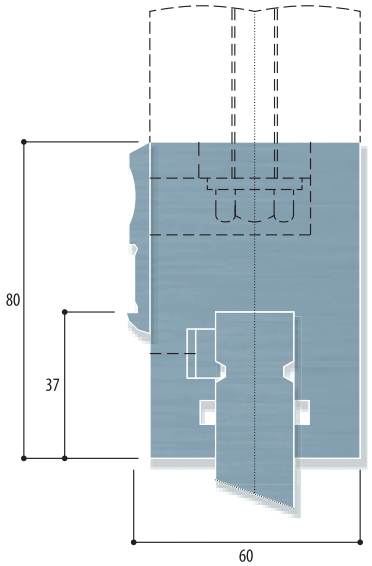
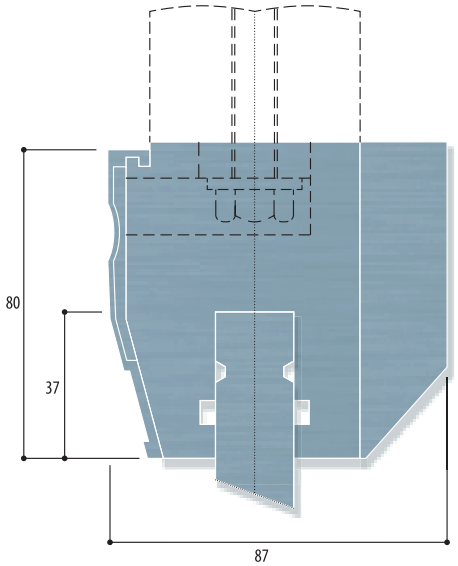


FIGURE 35 New Standard system with hydraulic clamping



NEW STANDARD TOOLING

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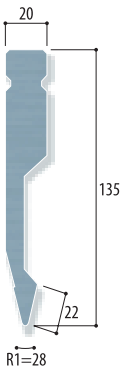
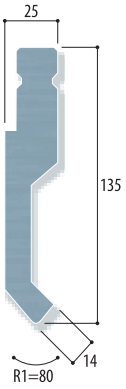
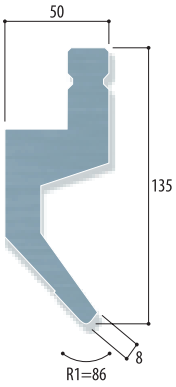
100 T/m	
BIU-001/1	515
BIU-001/2	550
BIU-001/3	200



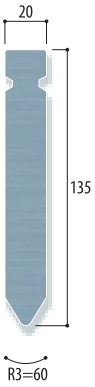
100 T/m	
BIU-002/1	515
BIU-002/2	550
BIU-002/3	200



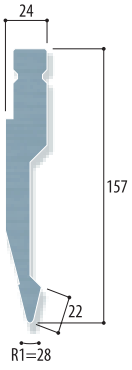
65 T/m	
BIU-003/1	515
BIU-003/2	550
BIU-003/3	200



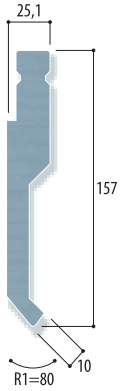
160 T/m	
BIU-004/1	515
BIU-004/2	550
BIU-004/3	200



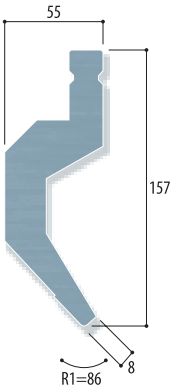
100 T/m	
BIU-011/1	515
BIU-011/2	550
BIU-011/3	200



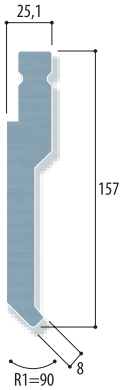
100 T/m	
BIU-012/1	515
BIU-012/2	550
BIU-012/3	200



65 T/m	
BIU-013/1	515
BIU-013/2	550
BIU-013/3	200



60 T/m	
BIU-015/1	515
BIU-015/2	550
BIU-015/3	200



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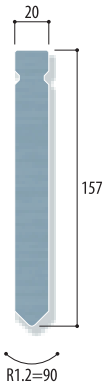
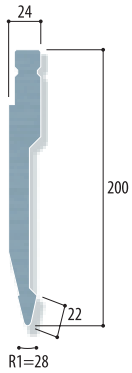
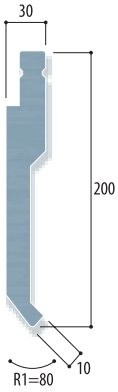
100 T/m	
BIU-016/1	515
BIU-016/2	550
BIU-016/3	200



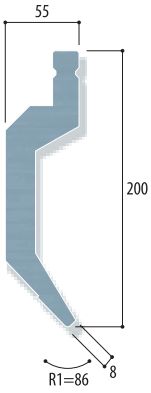
70 T/m	
BIU-021/1	515
BIU-021/2	550
BIU-021/3	200



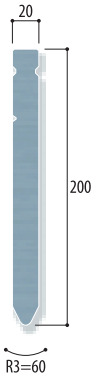
80 T/m	
BIU-022/1	515
BIU-022/2	550
BIU-022/3	200



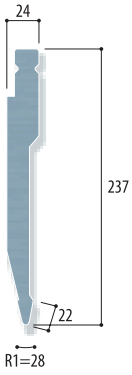
65 T/m	
BIU-023/1	515
BIU-023/2	550
BIU-023/3	200



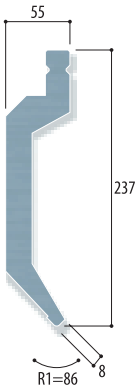
160 T/m	
BIU-024/1	515
BIU-024/2	550
BIU-024/3	200



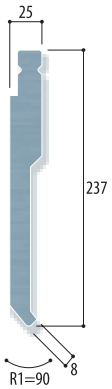
60 T/m	
BIU-031/1	515
BIU-031/2	550
BIU-031/3	200



50 T/m	
BIU-033/1	515
BIU-033/2	550
BIU-033/3	200



60 T/m	
BIU-035/1	515
BIU-035/2	550
BIU-035/3	200



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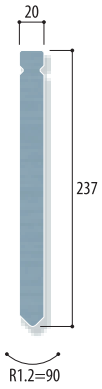
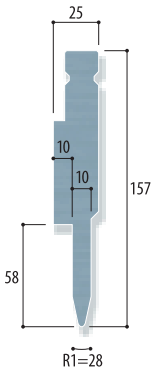
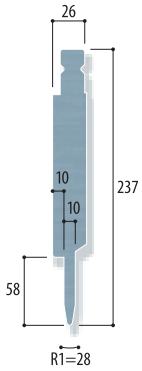
100 T/m	
BIU-036/1	515
BIU-036/2	550
BIU-036/3	200



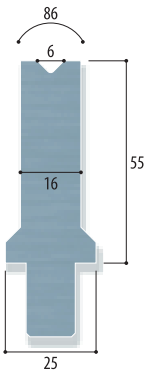
100 T/m	
BIU-051/1	515
BIU-051/2	550
BIU-051/3	200



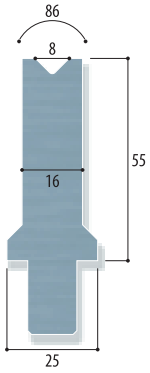
100 T/m	
BIU-053/1	515
BIU-053/2	550
BIU-053/3	200



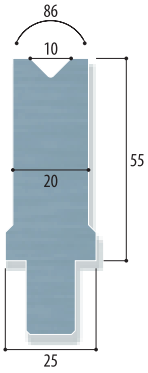
40 T/m	
OZU-021/1	515
OZU-021/2	550
OZU-021/3	200



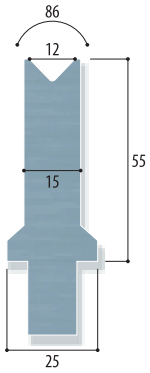
40 T/m	
OZU-010/1	515
OZU-010/2	550
OZU-010/3	200



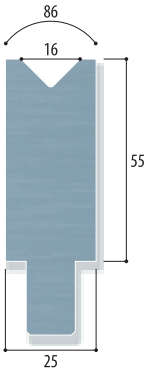
45 T/m	
OZU-022/1	515
OZU-022/2	550
OZU-022/3	200



50 T/m	
OZU-011/1	515
OZU-011/2	550
OZU-011/3	200



80 T/m	
OZU-012/1	515
OZU-012/2	550
OZU-012/3	200



NEW STANDARD TOOLING

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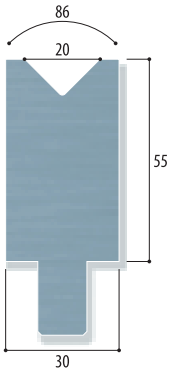
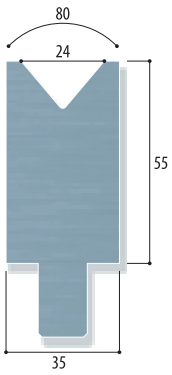
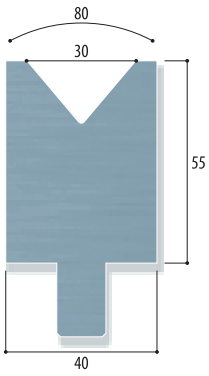
85 T/m	
OZU-023/1	515
OZU-023/2	550
OZU-023/3	200



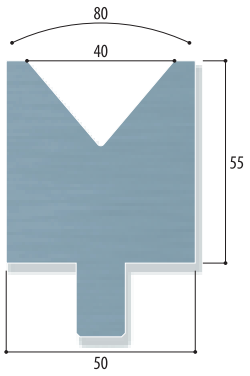
90 T/m	
OZU-013/1	515
OZU-013/2	550
OZU-013/3	200



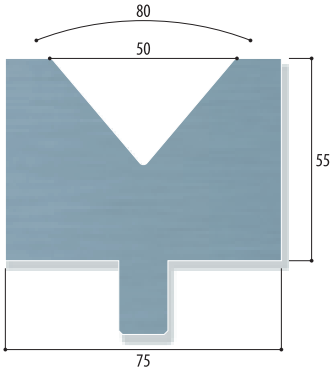
100 T/m	
OZU-014/1	515
OZU-014/2	550
OZU-014/3	200



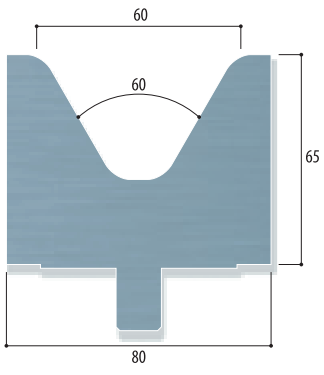
100 T/m	
OZU-015/1	515
OZU-015/2	550
OZU-015/3	200



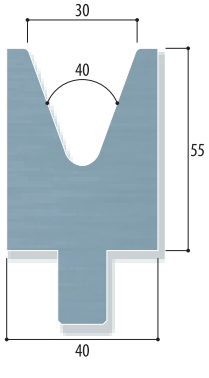
100 T/m	
OZU-035/1	515
OZU-035/2	550
OZU-035/3	200



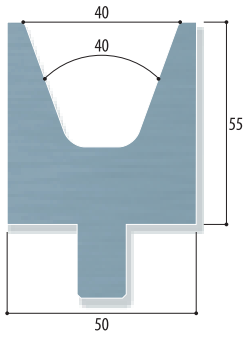
100 T/m	
OZU-016/1	515
OZU-016/2	550
OZU-016/3	200



70 T/m	
OZU-031/1	515
OZU-031/2	550
OZU-031/3	200



80 T/m	
OZU-032/1	515
OZU-032/2	550
OZU-032/3	200



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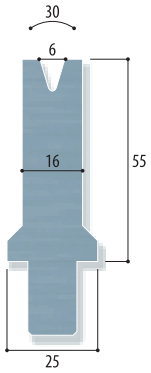
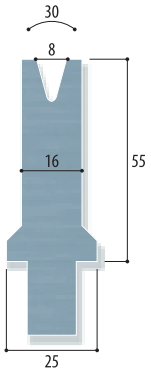
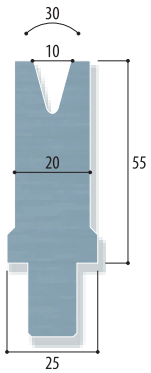
40 T/m	
OZU-061/1	515
OZU-061/2	550
OZU-061/3	200



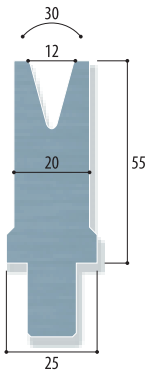
40 T/m	
OZU-051/1	515
OZU-051/2	550
OZU-051/3	200



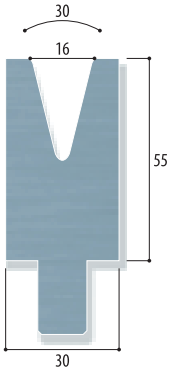
40 T/m	
OZU-062/1	515
OZU-062/2	550
OZU-062/3	200



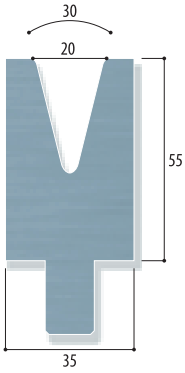
40 T/m	
OZU-052/1	515
OZU-052/2	550
OZU-052/3	200



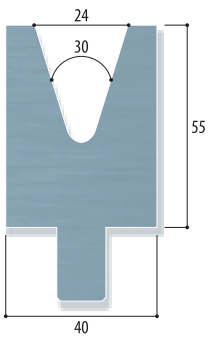
55 T/m	
OZU-053/1	515
OZU-053/2	550
OZU-053/3	200



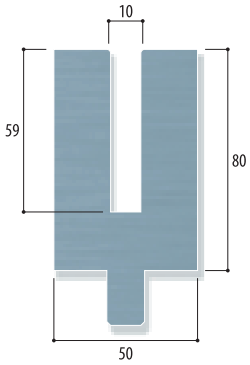
55 T/m	
OZU-063/1	515
OZU-063/2	550
OZU-063/3	200



60 T/m	
OZU-054/1	515
OZU-054/2	550
OZU-054/3	200



50 T/m	
OZU-081/1	515
OZU-081/2	550
OZU-081/3	200



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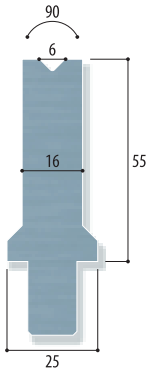
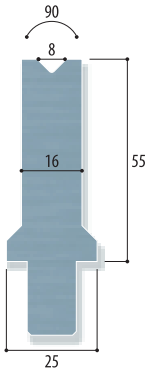
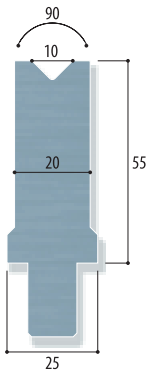
40 T/m	
OZU-041/1	515
OZU-041/2	550
OZU-041/3	200



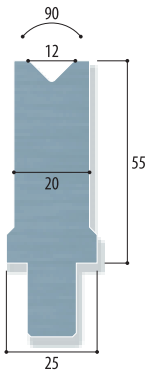
40 T/m	
OZU-042/1	515
OZU-042/2	550
OZU-042/3	200



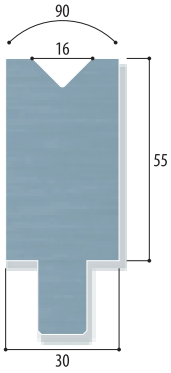
50 T/m	
OZU-043/1	515
OZU-043/2	550
OZU-043/3	200



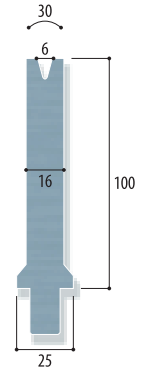
60 T/m	
OZU-044/1	515
OZU-044/2	550
OZU-044/3	200



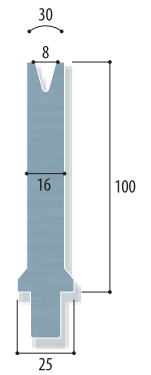
80 T/m	
OZU-045/1	515
OZU-045/2	550
OZU-045/3	200



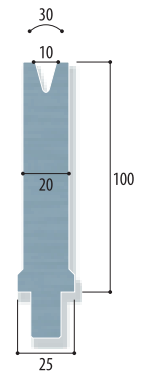
40 T/m	
OZU-361/1	515
OZU-361/2	550
OZU-361/3	200



40 T/m	
OZU-351/1	515
OZU-351/2	550
OZU-351/3	200



40 T/m	
OZU-362/1	515
OZU-362/2	550
OZU-362/3	200



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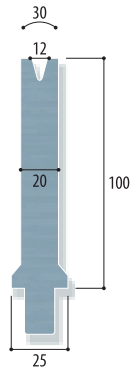
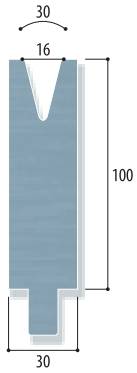
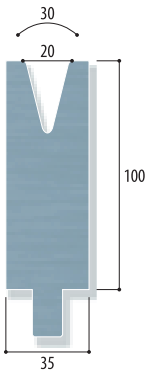
40 T/m	
OZU-352/1	515
OZU-352/2	550
OZU-352/3	200



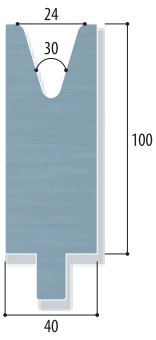
55 T/m	
OZU-353/1	515
OZU-353/2	550
OZU-353/3	200



55 T/m	
OZU-363/1	515
OZU-363/2	550
OZU-363/3	200



60 T/m	
OZU-354/1	515
OZU-354/2	550
OZU-354/3	200



ADJUSTABLE DIES

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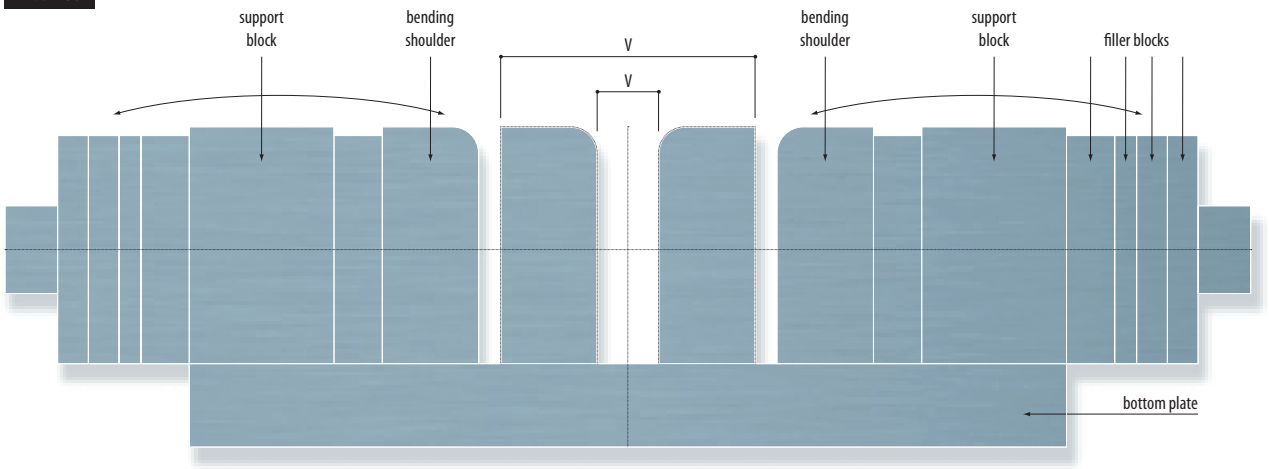
- When using the adjustable die type RS, it is possible to change the V-opening of the die in accordance with the sheet thickness to be bent, thus reducing time-consuming setup-requirements to an absolute minimum. The adjustable die type RS, is supplied with:
  - a bottom plate with support blocks;
  - filler blocks.
  - bending shoulders.

- In order to obtain the required V-opening, filler gauges need to be placed between the bending shoulders and the support blocks. The filler blocks need to be added/removed manually. The bending shoulders are hardened so wear is minimised. Furthermore, the bending shoulders can be supplied with the most ideal radius and can be delivered for retro-fitting if required.

RS 008 ..... range of V-opening: 12 - 80 mm
RS 007 ..... range of V-opening: 60 - 200 mm
RS 007 ..... range of V-opening: 200 - 350 mm

FIGURE 36

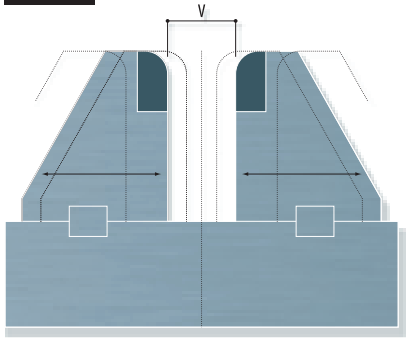


When using MVM type adjustable dies, it is possible to adjust the V-opening within the range of the system. The adjustment can either be manually or CNC-controlled. Timeconsuming setups are almost non-existant – especially advantageous when using big-sized and long tooling. The tooling always keeps the same position, moving the tooling is not needed at all.

- The bending shoulders are hardened and ground and can be supplied with 2 different shoulder radii, so the most ideal radius can be used every time. Changing the shoulder radius only requires turning the bending shoulder one way or the other. MVM adjustable dies are available in following executions:

MVM I 8-32 ..... range: 8 - 32 mm, stepless, manual or CNC-controlled adjustment
MVM I 13-50 ..... range: 13 - 50 mm, stepless, manual or CNC-controlled adjustment
MVM II 40-120. ..... range: 40 - 120 mm, in 10 mm steps, manual or CNC-controlled adjustment
MVM II 40-350. ..... range: 40 - 380 mm, in 20 mm steps, manual or CNC-controlled adjustment

FIGURE 37



ANTI DEFLECTION TABLES

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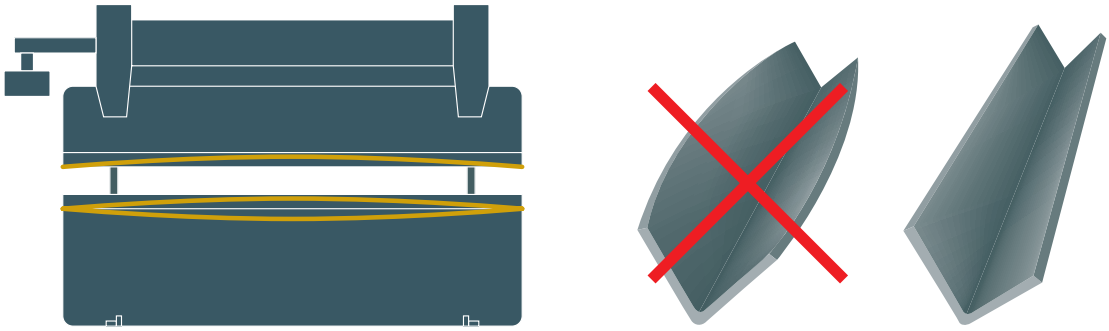
Angular variations caused by beam and machine deformation can be compensated for by the anti deflection table fitted directly on the lower beam. It works by means of a system of wedges moving progressively over each other, giving the table the desired form in order to compensate for beam and bed deflection. This results in a constant angular profile of the workpiece over the full working length of the machine. The anti deflection table can be set independently from machine type or execution and is available for standard Haco tooling, system-tooling, Single V-dies and New Standard Tools.

FIGURE 38



The anti deflection table delivered standard with the machines up to 4,3 m 3000 kN is manually controlled by hand wheel. In option, it can be motorised driven, controlled directly by the CNC control. On Euromasters 5/6 m 3000 kN and 3/4 m 4000 kN, the anti deflection table is hydraulic driven and CNC controlled as standard.

for Haco dies only

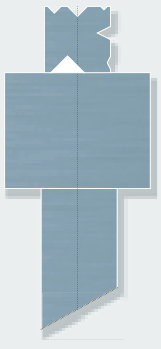


FIGURE 39

for Haco dies in combination with Single V-dies

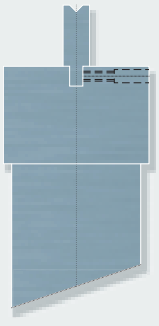


FIGURE 40

for Single V-dies only

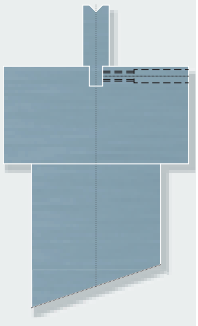


FIGURE 41

for System dies only

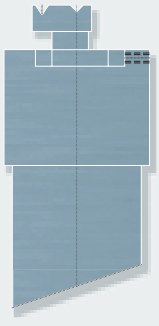


FIGURE 42

for System dies in combination with Single V-dies

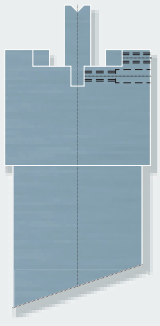


FIGURE 43

It can be retrofitted on exising Haco or non-Haco machines. Prices and information available on request.

HACO

for impressive

performances

HACO nv - Oekensestraat 120 - B-8800 Rumbeke (Belgium) - tel. +32 (0)51 26 52 00 - fax +32 (0)51 26 52 01 - sales@haco.com - www.haco.com

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