

Formtools and pilots
Formstähle und Führungsdorne
Outils de façon et pilotes
Skärstål och styrspindlar
Utensili e pilote
Cuchillas y pilotos



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Thanks to their profiled carbide tip, **mira** formtools allow a quick processing of the entire valve seat profile in one working cycle. **mira** offers you the largest range of formtools in various shapes, with seat widths from 0.5 to 8.0 mm and seat angles of 45 ° and 30 °, in two qualities ("normal" and "X" for extremely hard valve seats) and with 4 different holder types.

All formtools which are available from stock are listed in this catalogue.
The respective drawings of formtools are shown on pages 15- 34, assorted by seat angle and seat width.

mira can also offer special priced custom made formtools on request. Orders for special formtools may be placed by filling-in the order form included in this catalogue. You will find the required information in the corresponding vehicle manual. Any missing information must be established from the appropriate cylinder head or are available with the general dealer.

To determine the size of holder, please consider the valve seat diameter and the different types of tool-heads (refer to the following pages).

mira Formstähle ermöglichen dank ihrer profilierten Hartmetallschneide eine schnelle Bearbeitung des gesamten Ventilsitzprofils in einem Arbeitsgang. **mira** bietet Ihnen das grösste Sortiment an Formstählen in verschiedenen Formen, mit Sitzbreiten von 0.5 - 8.0 mm, Sitzwinkeln von 45 ° und 30 ° und zwei Qualitäten ("normal" und "X" für besonders harte Ventilsitze) sowie mit 4 verschiedenen Haltertypen.

Alle ab Lager erhältlichen Formstähle sind in diesem Katalog aufgelistet.
Die entsprechenden Formstahl-Zeichnungen finden Sie auf den Seiten 15 - 34, sortiert nach Sitzwinkel und Sitzbreite.

Nebst diesen Formstählen sind auf Anfrage auch Spezialformstähle erhältlich, welche zu einem Spezialpreis hergestellt werden. Für Bestellungen von Spezialanfertigungen füllen Sie bitte das Bestellformular in diesem Katalog aus. Die benötigten Daten finden Sie im Handbuch des entsprechenden Fahrzeuges. Fehlende Angaben sind bei Ihrem Generalimporteur erhältlich oder müssen am Zylinderkopf ausgemessen werden.

Für die Bestimmung des Halter-Typs sind der Ventilsitzdurchmesser sowie die verschiedenen Drehkopftypen zu berücksichtigen (s. folgende Seiten).

*Grâce à leur lame profilée en métal dur, les outils de façonnage **mira** permettent l'usinage rapide des sièges de soupape, en une seule passe. **mira** vous propose un immense assortiment d'outils de façonnage de diverses formes, avec des largeurs de siège de 0,5 à 8,0 mm et des angles de siège de 45 ° ou 30 °, en deux qualités (normale et X, pour les sièges de soupape particulièrement durs), et avec 4 divers types de support.*

*Tous les outils de façonnage disponibles sur stock sont énumérés dans le présent catalogue.
Vous trouverez les dessins correspondants aux pages 15 à 34, classés selon les angles et les largeurs de siège.*

Outre les outils ci-dessus, des outils de façonnage spéciaux, fabriqués à des prix eux aussi spéciaux, sont disponibles sur demande. Pour la commande de versions spéciales, nous vous prions de remplir le formulaire inclus dans ce catalogue. Vous trouverez les données nécessaires dans le manuel de véhicule correspondant. Les données manquantes seront disponibles auprès de votre importateur général, ou bien vous devrez les mesurer sur la culasse.

Pour déterminer le type de support, il faudra tenir compte de diamètre des sièges de soupape ainsi que des divers types de têtes tournantes (v. les pages suivantes).



Formtools
Formstähle
Outils de façon
Skärstål
Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

α
 Seat angle
 Sitzwinkel
Angle du siège
 Sätessvinkel
Angolo di sede
Ángulo del asiento

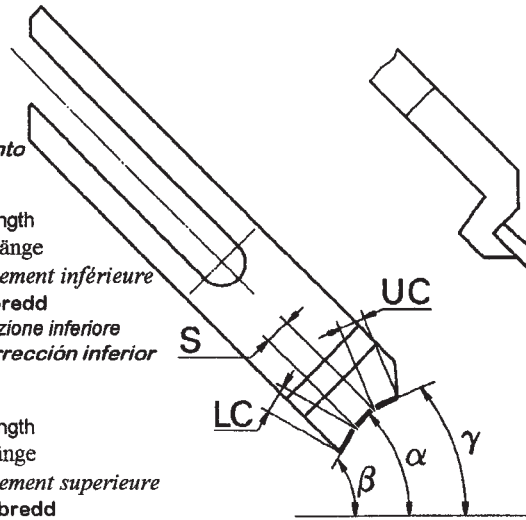
β
 Lower correction angle
 Unterer Korrekturwinkel
Angle du dégagement inférieur
 Inre korrektionsvinkel
Angolo di correzione inferiore
Ángulo de la corrección inferior

γ
 Upper correction angle
 Oberer Korrekturwinkel
Angle du dégagement supérieur
 Yttre korrektionsvinkel
Angolo di correzione superiore
Ángulo de la corrección superior

S
 Seat width
 Sitzbreite
Largeur du siège
 Sätessbredd
Larghezza di sede
Largura del asiento

LC
 Lower correction length
 Untere Korrekturlänge
Largeur du dégagement inférieure
 Inre korrektionsbredd
Larghezza di correzione inferiore
Largura de la corrección inferior

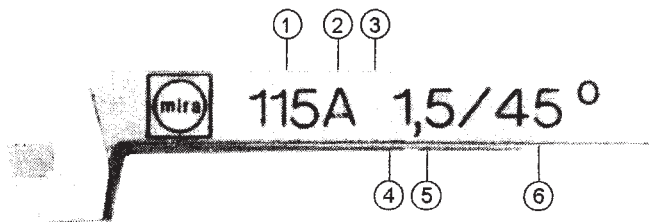
UC
 Upper correction length
 Obere Korrekturlänge
Largeur du dégagement supérieure
 Yttre korrektionsbredd
Larghezza della correzione superiore
Largura de la corrección superior



ϵ
 Clearance angle
 Freiwinkel
Dépouille
 Släppingsvinkel
Angolo di spoglia inferiore
Despojo

δ
 Cutting angle
 Schnittwinkel
Angle de coupe
 Skärsvinkel
Angolo di spoglia anteriore
Ángulo de corte

Lettering of Formtools
Beschriftung der Formstähle
Inscription des outils de façon
Märkning av skärstål
Dicitura degli utensili ad angolazione multipla
Denominación de las cuchillas de mandrinado moldeadas

① Formtool No.	Formstahlnummer	<i>Nombre d'outil</i>	Skärstålnummer	<i>Numero dell'utensile</i>	<i>Número de la cuchilla</i>
② Formtool model A - normal diameters B - bigger diameters C - only little diameters D - only D3 tool-head for biggest diameters	Formstahl-Typ	<i>Modèle de l'outil</i>	Skärstålstyp	<i>Tipo d'utensile</i>	<i>Modelo de la cuchilla</i>
③ Carbide tool bit - no indication, normale qualit - X indication, special quality	Hartmetall	<i>Métal dur</i>	Hårdmetall	<i>Metallo duro</i>	<i>Metal duro</i>
④ Cutting angle - no indication = 3° - /11° indication, for little Ø	Schnittwinkel	<i>Angle de coupe</i>	Skärsvinkel	<i>Angolo di spoglia anteriore</i>	<i>Ángulo de corte</i>
⑤ Seat width in mm	Sitzbreite in mm	<i>Largeur du siège en mm</i>	Sätessbredd i mm	<i>Larghezza di sede in mm</i>	<i>Largura del asiento in mm</i>
⑥ Seat angle in °	Sitzwinkel in °	<i>Angle du siège en °</i>	Sätessvinkel i °	<i>Angolo di sede in °</i>	<i>Ángulo del asiento in °</i>



Order Form for Mira Formtools
Bestellformular für Mira-Formstähle
Bulletin de commande pour outils Mira

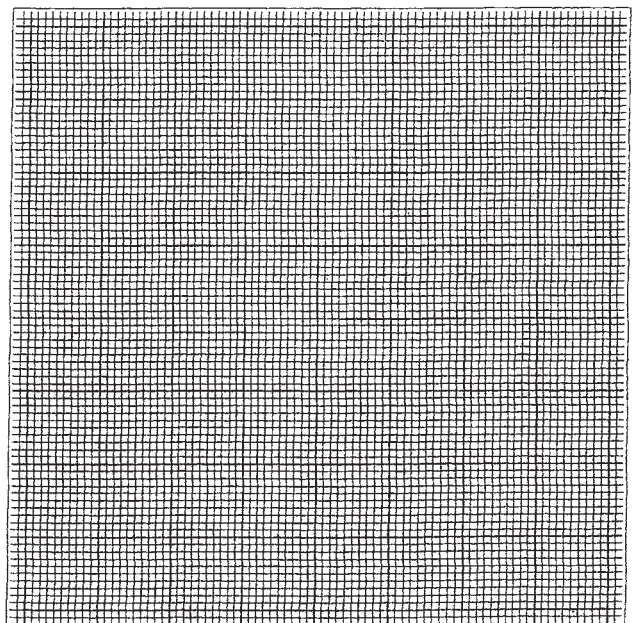
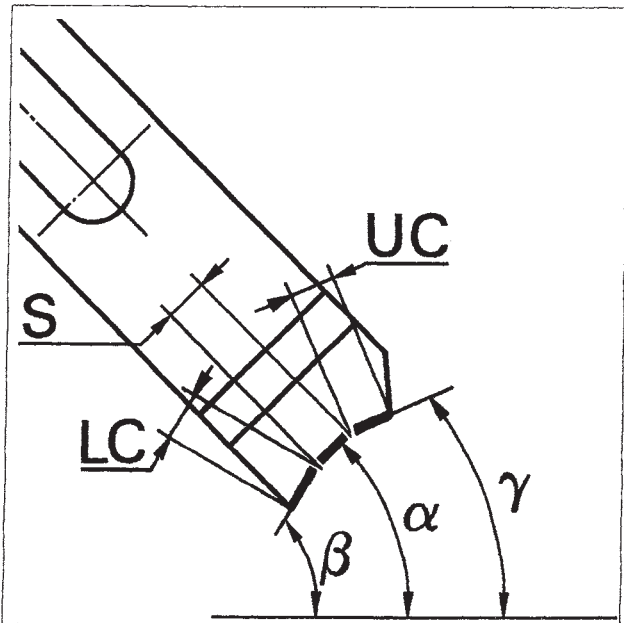
Local dealer: _____ Name: _____ Date of purchase: _____

Information needed about the Vehicle:

Mark: _____ Vehicle brand: _____ Year: _____
 Engine type: _____ Fuel/Diesel: _____ Volume (ccm): _____

Information needed about the cylinderhead:

	<u>Inlet Valve:</u>	<u>Outlet Valve:</u>
Seat width in mm	s = _____	s = _____
Seat angle in °	α = _____	α = _____
Upper correction length in mm	UC = _____	UC = _____
Upper correction angle in °	γ = _____	γ = _____
Lower correction length in mm	LC = _____	LC = _____
Lower correction angle in °	β = _____	β = _____
Valveguide	\emptyset = _____	\emptyset = _____
Carbide tool bit (normal or X)	N <input type="checkbox"/> X <input type="checkbox"/>	N <input type="checkbox"/> X <input type="checkbox"/>
Holder type (valve- \emptyset)	A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/>	A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/>



Please fill in this form completely, this assures a prompt delivery without delays because of further information needed in production and also helps us to update our formtool list. If the requested formtool is very different from the one above, please fill in a drawing or add a copy of the manual.


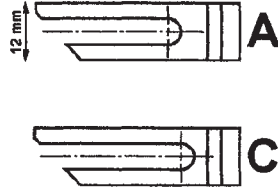



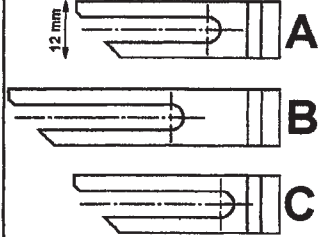

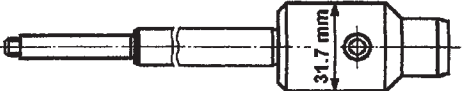
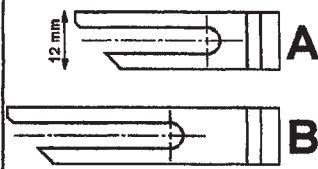

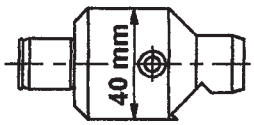
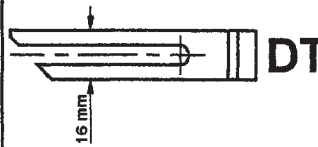
Manufacturer and worldwide distributor:

MINELLI CORPORATION
 8330 Pfäffikon/ZH
 Switzerland
 Phone: +41/1/950 17 20 Fax: +41/1/950 11 32



Tool-heads
 Drehköpfe
 Têtes porte-outils
 Skärhuvuden
 Teste porta-utensili
 Cabezales mandrinadores

Types of Formtools
 Formstahl-Typen
 Modèles d'outils
 Skärstålmodeller
 Tipi d'utensili
 Modeles de cuchilla

Spindle size Drehkopf-Grösse Modèle de broche Storlek skärhuvud Modello testa porta-utensili Talla del cabezal mandrinador	Formtool model Formstahl-Typ Modèle de l'outil Skärstålstyp Tipo d'utensile Modelo de la cuchilla	Processing-Ø (formtool 115) Bearbeitungs-Ø (Formstahl 115) Ø d'usinage (outil 115) Bearbetnings Ø (skärstål 115) Ø di lavorazione (utensile 115) Ø de labra (cuchilla 115)	Processing-Ø ring seating tool 390 Bearbeitungs-Ø Ringsitzstahl 390 Ø d'usinage pour un acier 390 Bearbetnings Ø Stål för ringsäten 390 Ø di lavorazione per un acciaio 390 Ø de labra por un acero 390
<p>DRC05/DT05 suitable for FDM, FDMH pilots</p> 		 <p>20 to/bis/à 35 16 to/bis/à 30</p>	 <p>23 to/bis/à 38 21 to/bis/à 34</p>
<p>DRC1/DT1 suitable for FD pilots</p>  <p>(Standard model) (Standardtyp) (Modèle standard)</p>		 <p>23 to/bis/à 36 31 to/bis/à 45 21 to/bis/à 33</p>	<p>28 to/bis/à 38 34 to/bis/à 48 25 to/bis/à 35 DSD Ø35-45</p>
<p>DRC2/DT2 suitable for FD pilots</p> 		 <p>37 to/bis/à 42 38 to/bis/à 55</p>	<p>42 to/bis/à 48 42 to/bis/à 58 DSD Ø45-55</p>
<p>DT3 suitable for FD pilots</p> 		<p>35 to/bis/à 75</p>	<p>DSD Ø55-75</p>



Pilots
Führungsdorne
Pilotes
Styrspindlar
Piloti
Pilotos

Plug-in pilot

suitable for DRC-, DT-tool-head models



FD \varnothing 5.87 - 9.20
D= \varnothing 9.52
L= 100

FD \varnothing 9.30 - 16.00
D= \varnothing 9.52
L= 138

FDM \varnothing 3.49 - 6.02
D= \varnothing 6.00
L= 60

FDMH sintered carbide type
only available on request

mira formtool list
mira Formstahlliste

Specification		Seatwidth	Seatangle	Cutting angle	Lower correction	1. Upper correction		2. Upper correction		Page	
Bezeichnung		Sitzbreite	Sitzwinkel	Schnittwinkel	Untere Korrektur	1. Obere Korrektur		2. Obere Korrektur		Seite	
		s	∠	∠	∠	L	∠	L	∠	L	
	105C	0.5/45°	0.5	45°30'	3°	60°	3.5	25°	1.5		16
	107C	0.7/45°	0.7	45°30'	3°	60°	3.5	25°	1.5		16
	108A	0.8/45°	0.8	45°30'	3°	60°	3.5	25°	1.5		16
	108B	0.8/45°	0.8	45°30'	3°	60°	3.5	25°	1.5		16
	108C	0.8/45°	0.8	45°30'	3°	60°	3.5	25°	1.5		16
T	108CX	0.8/45°	0.8	45°30'	3°	60°	3.5	25°	1.5		16
	110A	1.0/45°	1.0	45°30'	3°	60°	3.5	25°	1.5		16
T	110AX	1.0/45°	1.0	45°30'	3°	60°	3.5	25°	1.5		16
	110B	1.0/45°	1.0	45°30'	3°	60°	3.5	25°	1.5		16
T	110BX	1.0/45°	1.0	45°30'	3°	60°	3.5	25°	1.5		16
	110C	1.0/45°	1.0	45°30'	3°	60°	3.5	25°	1.5		16
T	110CX	1.0/45°	1.0	45°30'	3°	60°	3.5	25°	1.5		16
	115A	1.5/45°	1.5	45°30'	3°	60°	3.5	25°	1.5		15
T	115AX	1.5/45°	1.5	45°30'	3°	60°	3.5	25°	1.5		16
	115B	1.5/45°	1.5	45°30'	3°	60°	3.5	25°	1.5		16
T	115BX	1.5/45°	1.5	45°30'	3°	60°	3.5	25°	1.5		16
	115C	1.5/45°	1.5	45°30'	3°	60°	3.5	25°	1.5		16
T	115CX	1.5/45°	1.5	45°30'	3°	60°	3.5	25°	1.5		16
	115D	1.5/45°	1.5	45°30'	3°	60°	3.5	25°	1.5		16
	120A	2.0/45°	2.0	45°30'	3°	60°	3.5	25°	1.5		15
T	120AX	2.0/45°	2.0	45°30'	3°	60°	3.5	25°	1.5		16
	120B	2.0/45°	2.0	45°30'	3°	60°	3.5	25°	1.5		16
T	120BX	2.0/45°	2.0	45°30'	3°	60°	3.5	25°	1.5		16
	120D	2.0/45°	2.0	45°30'	3°	60°	3.5	25°	1.5		16
	125A	2.5/45°	2.5	45°30'	3°	60°	3.5	25°	1.5		16
	125B	2.5/45°	2.5	45°30'	3°	60°	3.5	25°	1.5		16
T	125BX	2.5/45°	2.5	45°30'	3°	60°	3.5	25°	1.5		16
	125D	2.5/45°	2.5	45°30'	3°	60°	3.5	25°	1.5		16
	130B	3.0/45°	3.0	45°30'	3°	60°	3.5	25°	1.5		16
T	130BX	3.0/45°	3.0	45°30'	3°	60°	3.5	25°	1.5		16
	135B	3.5/45°	3.5	45°30'	3°	60°	3.5	25°	1.5		16
	135D	3.5/45°	3.5	45°30'	3°	60°	3.5	25°	1.5		16
	140B	4.0/45°	4.0	45°30'	3°	60°	3.5	25°	1.5		16
	208C	0.8/30°	0.8	30°30'	3°	60°	3.5	15°	1.5		27
	210A	1.0/30°	1.0	30°30'	3°	60°	3.5	15°	1.5		27
T	210AX	1.0/30°	1.0	30°30'	3°	60°	3.5	15°	1.5		27
	210B	1.0/30°	1.0	30°30'	3°	60°	3.5	15°	1.5		27
T	210BX	1.0/30°	1.0	30°30'	3°	60°	3.5	15°	1.5		27
	210C	1.0/30°	1.0	30°30'	3°	60°	3.5	15°	1.5		27
	212B	1.2/30°	1.2	30°30'	3°	60°	3.5	15°	1.5		27
	215A	1.5/30°	1.5	30°30'	3°	60°	3.5	15°	1.5		26
T	215AX	1.5/30°	1.5	30°30'	3°	60°	3.5	15°	1.5		27
	215B	1.5/30°	1.5	30°30'	3°	60°	3.5	15°	1.5		27
T	215BX	1.5/30°	1.5	30°30'	3°	60°	3.5	15°	1.5		27
	215C	1.5/30°	1.5	30°30'	3°	60°	3.5	15°	1.5		27
	220A	2.0/30°	2.0	30°30'	3°	60°	3.5	15°	1.5		26
T	220AX	2.0/30°	2.0	30°30'	3°	60°	3.5	15°	1.5		27
	220B	2.0/30°	2.0	30°30'	3°	60°	3.5	15°	1.5		27
T	220BX	2.0/30°	2.0	30°30'	3°	60°	3.5	15°	1.5		27
	220D	2.0/30°	2.0	30°30'	3°	60°	3.5	15°	1.5		27
	225B	2.5/30°	2.5	30°30'	3°	60°	3.5	15°	1.5		26
T	225BX	2.5/30°	2.5	30°30'	3°	60°	3.5	15°	1.5		27
	225D	2.5/30°	2.5	30°30'	3°	60°	3.5	15°	1.5		27
	230B	3.0/30°	3.0	30°30'	3°	60°	3.5	15°	1.5		27
T	230BX	3.0/30°	3.0	30°30'	3°	60°	3.5	15°	1.5		27
	230D	3.0/30°	3.0	30°30'	3°	60°	3.5	15°	1.5		27

mira formtool list
mira Formstahlliste

Specification		Seatwidth	Seatangle	Cutting angle	Lower correction		1. Upper correction		2. Upper correction		Page
Bezeichnung		Sitzbreite	Sitzwinkel	Schnittwinkel	Untere Korrektur		1. Obere Korrektur		2. Obere Korrektur		Seite
		s	∠	∠	∠	L	∠	L	∠	L	
	235B	3.5/30°	3.5	30°30'	3°	60°	3.5	15°	1.5		27
	240B	4.0/30°	4.0	30°30'	3°	60°	3.5	15°	1.5		27
	301A	45°	9.0	45°30'	3°						33
T	301AX	45°	9.0	45°30'	3°						33
	301B	45°	9.0	45°30'	3°						33
T	301BX	45°	9.0	45°30'	3°						33
	301C	45°	9.0	45°30'	3°						33
	301D	45°	13.0	45°30'	3°						33
	302A	30°	9.0	30°30'	3°						33
T	302AX	30°	9.0	30°30'	3°						33
	302B	30°	9.0	30°30'	3°						33
T	302BX	30°	9.0	30°30'	3°						33
	302C	30°	9.0	30°30'	3°						33
	302D	30°	9.0	30°30'	3°						33
	303B	35°	10.0	35°30'	3°						33
	304B	45°	12.0	45°30'	3°						33
T	304BX	45°	12.0	45°30'	3°						33
	305B	30°	12.0	30°30'	3°						33
T	305BX	30°	12.0	30°30'	3°						33
	306A	20°	7.5	20°30'	3°						33
	306B	20°	7.5	20°30'	3°						33
T	306BX	20°	7.5	20°30'	3°						33
	306D	20°	7.5	20°30'	3°						33
	351A	75°			3°	75°	14.0				33
	351B	75°			3°	75°	14.0				33
T	351BX	75°			3°	75°	14.0				33
	351C	75°			3°	75°	14.0				33
T	351CX	75°			3°	75°	14.0				33
	352A	15°			3°			15°	9.5		34
	352B	15°			3°			15°	9.5		34
T	352BX	15°			3°			15°	9.5		34
	352D	15°			3°			15°	9.5		34
	353A	75°			3°	75°	7.0				33
	353B	75°			3°	75°	7.0				33
	354B	15°			3°			15°	4.0	R7.0	34
	355B	38°			3°			38°	6.5	R5.4	34
	357B	39°			3°			39°	2.0	R6.5	34
	358B				3°	R27.5					33
	360B	25°			3°			25°	9.5		34
	362A	60°			3°	60°	11.0				33
	362B	60°			3°	60°	11.0				33
	363B	80°			3°						34
	365A	85°			3°	85°	12.0				33
	365B	85°			3°	85°	12.0				33
	390A		8.0	0°0'	3°						34
	390AP		8.0	0°0'	3°						34
T	390AX		8.0	0°0'	3°						34
	390B		8.0	0°0'	3°						34
	390BP		8.0	0°0'	3°						34
T	390BX		8.0	0°0'	3°						34
	390C		8.0	0°0'	3°						34
	390CP		8.0	0°0'	3°						34
T	390CX		8.0	0°0'	3°						34
	390D		8.0	0°0'	3°						34
	4001A	1.0/45°	1.0	45°30'	3°	60°	3.5	0°	1.5		17
	4002A	1.5/45°	1.5	45°30'	3°	60°	3.5	0°	1.5		21

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Specification		Seatwidth	Seatangle	Cutting angle	Lower correction	1. Upper correction		2. Upper correction		Page		
Bezeichnung		Sitzbreite	Sitzwinkel	Schnittwinkel	Untere Korrektur	1. Obere Korrektur		2. Obere Korrektur		Seite		
		s	∠	∠	∠	L	∠	L	∠	L		
	4046B	1.0/45°	1.0	45°30'	3°	R5.0	4.0	40°	2.0		18	
	4047B	1.0/45°	1.0	45°30'	3°	R12		40°	2.0		18	
	4048B	1.0/45°	1.0	45°30'	3°	R12	3.5	40°	2.0		18	
	4050B	1.0/45°	1.0	45°30'	3°	74°	7.0	35°	2.0		18	
	4052B	1.5/45°	1.5	45°30'	3°	60°	3.5	R6.0			21	
	4053B	1.5/45°	1.5	45°30'	3°	53°	3.5	37°	1.7		21	
	4058B	1.5/45°	1.5	45°30'	3°	60°	3.5	0°	0.7	60°	6.5	21
	4060A	1.4/45°	1.4	45°30'	3°	75°	3.5	32.5°	1.0	R5.0		20
	4060B	1.4/45°	1.4	45°30'	3°	75°	3.5	32.5°	1.0	R5.0		20
	4061A	1.4/45°	1.4	45°30'	3°	75°	3.5	32.5°	1.5	R6.0	R2.0	20
	4063A	1.0/45°	1.0	45°30'	3°	R6.0		R4.7				18
	4063B	1.0/45°	1.0	45°30'	3°	R6.0		R4.7				18
	4064A	0.8/45°	0.8	45°30'	3°	60°	4.5	32.5°	1.0	R5.0		17
	4064B	0.8/45°	0.8	45°30'	3°	60°	4.5	32.5°	1.0	R5.0		17
	4065B	1.2/45°	1.2	45°30'	3°	65°	4.5	35°	1.5	R0.9		19
	4072B	7.0/45°	7.0	45°30'	3°	60°	4.0					25
T	4072BX	7.0/45°	7.0	45°30'	3°	60°	4.0					25
	4074A	1.5/45°	1.5	45°30'	3°	R12		15°	2.0			21
	4074B	1.5/45°	1.5	45°30'	3°	R12		15°	2.0			21
	4076B	1.3/45°	1.3	45°30'	3°	R6.6	4.5	37.5°	2.0			20
	4077B	1.3/45°	1.3	45°30'	3°	55°	2.5	40°	2.5			20
	4080B	2.0/45°	2.0	45°30'	3°	60°	3.5	0°	0.3	45°	6.5	23
T	4081BX	2.0/45°	2.0	45°30'	3°	55°	3.5	30°	4.0			23
	4086B	1.0/45°	1.0	45°30'	3°	65°	4.0	R6.0				18
	4086C	1.0/45°	1.0	45°30'	3°	65°	4.0	R6.0				18
	4087B	1.2/45°	1.2	45°30'	3°	65°	4.0	R6.0				19
	4090C	1.3/45°	1.3	45°30'	3°	65°	4.0	R6.3				20
	4091A	3.0/45°	3.0	45°30'	3°	75°	8.0					24
	4092B	4.0/45°	4.0	45°30'	3°	R10						25
	4093B	3.0/45°	3.0	45°30'	3°	60°	3.5	30°	1.5			24
	4094B	1.2/45°	1.2	45°30'	3°	70°	7.5	20°	1.1			19
	4095B	1.0/45°	1.0	45°30'	3°	R4.0	4.5	20°	2.0	R2.0		18
	4096B	2.3/45°	2.3	45°30'	3°	70°	6.0	0°	1.5			24
	4098B	1.5/45°	1.5	45°30'	3°	R12		40°	2.0			22
	4099B	1.3/45°	1.3	45°0'	3°	60°	3.5	30°	2.0			20
	4100B	1.4/45°	1.4	45°0'	3°	60°	4.0	35°	2.5			21
	4101B	1.2/45°	1.2	45°0'	3°	60°	3.5	35°	2.0			19
	4102B	1.1/45°	1.1	45°0'	3°	60°	3.5	38°	2.5			19
	4104B	1.5/45°	1.5	45°30'	3°	R12	3.0	35°	2.0	R1.0		22
	4105B	2.0/45°	2.0	45°30'	3°	R12	3.0	35°	2.0	R1.0		23
T	4107BX	2.5/45°	2.5	45°30'	3°	75°	4.0	15°	3.0	R0.4		24
	4109A	1.5/45°	1.5	45°30'	3°	70°	5.0	0°	0.9			22
	4110A	2.0/45°	2.0	45°30'	3°	70°	5.0	0°	0.7			23
	4111A	2.0/45°	2.0	45°30'	3°	70°	5.0	0°	1.2			23
	4112A	1.5/45°	1.5	45°30'	3°	70°	5.0	0°	1.1			22
	4120B	1.2/45°	1.2	45°30'	3°	70°	4.5	30°	2.0			20
	4121A	2.0/45°	2.0	45°30'	3°	75°	7.0	15°	2.3	R0.7		24
T	4122BX	1.5/45°	1.5	45°30'	3°	75°	6.0	15°	3.5			22
	4129B	1.5/45°	1.5	45°30'	3°	75°	5.0	15°	1.5			22
	4130A	2.0/45°	2.0	45°30'	3°	75°	5.0	15°	1.5			24
	4130B	2.0/45°	2.0	45°30'	3°	75°	5.0	15°	1.5			24
	4131C	1.1/45°	1.1	45°30'	3°	65°	4.0		1.5	R6.3		19
	4132C	1.2/45°	1.2	45°30'	3°	65°	4.0		1.5	R6.3		20
	4135B	1.0/45°	1.0	45°30'	3°	82°	7.0	20°	1.0			19
	4136B	R1.5			3°	82°	7.0	15°	1.0	R0.8		25
	4138B	1.5/45°	1.5	45°30'	3°	R5	4.0	30°	3.0	R1.0		22

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Specification	Seatwidth	Seatangle	Cutting angle	Lower correction	1. Upper correction	2. Upper correction	Page				
Bezeichnung	Sitzbreite	Sitzwinkel	Schnittwinkel	Untere Korrektur	1. Obere Korrektur	2. Obere Korrektur	Seite				
	s	∠	∠	∠	L	∠	L				
T 4139BX	3.0/45°	3.0	45°30'	3°	65°	3.5	38°	2.6	R1.5	25	
4140B	1.7/45°	1.7	45°30'	3°	60°	5.0	30°	1.5		22	
4141B	0.8/45°	0.8	45°30'	3°	R3.4	4.5	R2.6		45°	0.7	17
4142B	0.8/45°	0.8	45°30'	3°	R3.5	4.5	R1.0		R5.4		17
4143B	0.8/45°	0.8	45°30'	3°	R5.5	6.0	R2.2		45°	0.7	17
4144A	1.0/45°	1.0	45°30'	3°	60°	7.0	30°	4.0			19
4144B	1.0/45°	1.0	45°30'	3°	60°	7.0	30°	4.0			19
4146A	0.5/45°	0.5	45°30'	3°	75°	4.5	30°	4.0	R0.7		17
4147A	1.3/45°	1.3	45°30'	3°	75°	4.0	30°	2.0			20
4148A	1.3/45°	1.3	45°30'	3°	75°	3.5	15°	1.0			20
4150B	3.5/45°	3.5	45°0'	3°	65°	7.0	5°	2.0			25
4157B	1.3/45°	1.3	45°30'	3°	R12		30°	2.5			20
4158B	4.5/45°	4.5	45°30'	3°			0°	0.7	45°	7.0	25
4159B	5.5/45°	5.5	45°30'	3°			0°	0.5	45°	6.0	25
4182A	0.8/45°	0.8	45°30'	3°	65°	5.5	32°	2.5			17
4187A	2.0/45°	2.0	45°30'	3°	70°	3.5	30°	1.5			24
4188A	2.4/45°	2.4	45°30'	3°	70°	3.5	30°	1.5			24
4203A	1.4/45°	1.4	45°30'	3°	70°	3.3	30°	2.5	R0.5		21
T 4229CX	0.85/45°	0.8	45°0'	3°	R9.5	1.0	30°	2.0	R3.0		17
4231A	0.8/45°	0.8	45°0'	3°	60°	3.5	30°	1.5			17
4231C	0.8/45°	0.8	45°0'	3°	60°	3.5	30°	1.5			17
4232A	1.0/45°	1.0	45°0'	3°	60°	3.5	30°	1.5			19
T 4232CX	1.0/45°	1.0	45°0'	3°	60°	3.5	30°	1.5			19
4243A	1.5/45°	1.5	45°0'	3°	67°	3.5	30°	1.5			22
4248A	1.0/45°	1.0	45°30'	3°	R3.0	3.0	25°	1.0	R2.0		19
4254A	1.5/45°	1.5	45°30'	3°	65°	3.5	38°	2.6	R1.5		22
4268A	1.0/45°	1.0	45°30'	3°	65°	3.5	38°	2.6	R1.5		19
4502B	2.0/30°	2.0	30°30'	3°	74°	4.0	15°	1.5			28
4503B	2.0/35°	2.0	35°30'	3°	60°	3.5	15°	1.5			32
4504B	1.5/30°	1.5	30°30'	3°	60°	3.5	0°	2.0			28
T 4505BX	2.6/38°	2.6	38°30'	3°	60°	3.5	15°	1.5			32
4506B	3.5/30°	3.5	30°30'	3°	60°	3.5	R0.6				29
4507B	3.2/35°	3.2	35°30'	3°	75°	5.5	0°	1.0			32
4508B	1.7/35°	1.7	35°30'	3°	60°	5.0	0°	1.0			32
T 4509BX	2.0/30°	2.0	30°30'	3°	65°	3.5	23°	1.5	R1.5		28
4510B	1.0/30°	1.0	30°30'	3°	R12		15°	2.0			28
T 4512BX	2.5/30°	2.5	30°30'	3°	75°	4.0	15°	3.5			29
4514B	1.0/30°	1.0	30°30'	3°	52°	3.5	23°	1.5			28
4515A	1.5/30°	1.5	30°30'	3°	52°	3.5	23°	1.5			28
T 4515AX	1.5/30°	1.5	30°30'	3°	52°	3.5	23°	1.5			28
4515B	1.5/30°	1.5	30°30'	3°	52°	3.5	23°	1.5			28
T 4515BX	1.5/30°	1.5	30°30'	3°	52°	3.5	23°	1.5			28
4516B	2.0/30°	2.0	30°30'	3°	52°	3.5	23°	1.5			28
T 4516BX	2.0/30°	2.0	30°30'	3°	52°	3.5	23°	1.5			28
4517B	2.5/30°	2.5	30°30'	3°	52°	3.5	23°	1.5			29
4518A	1.2/30°	1.2	30°30'	3°	55°	3.5	10°	1.7			28
4519B	3.0/30°	3.0	30°30'	3°	60°	3.5	0°	1.0	R1.7		29
4520B	0.75/30°	0.75	30°30'	3°	R9.2	3.5	20°	1.5	R0.9		28
4523B	2.5/20°	2.5	20°30'	3°	60°	4.0	0°	1.8			31
4524B	2.0/20°	2.0	20°30'	3°	60°	4.0	0°	1.8			31
4525B	2.0/30°	2.0	30°30'	3°	60°	4.5	15°	0.8			29
T 4526BX	2.0/30°	2.0	30°30'	3°	60°	5.0	15°	3.5			29
4529B	1.5/35°	1.5	35°30'	3°	60°	3.5	15°	1.5			32
T 4530BX	1.2/30°	1.2	30°30'	3°	75°	4.0	15°	2.0			28
4531B	7.0/30°	7.0	30°30'	3°			15°	2.5			29
4535B	5.0/30°	5.0	30°30'	3°	60°	4.0					29

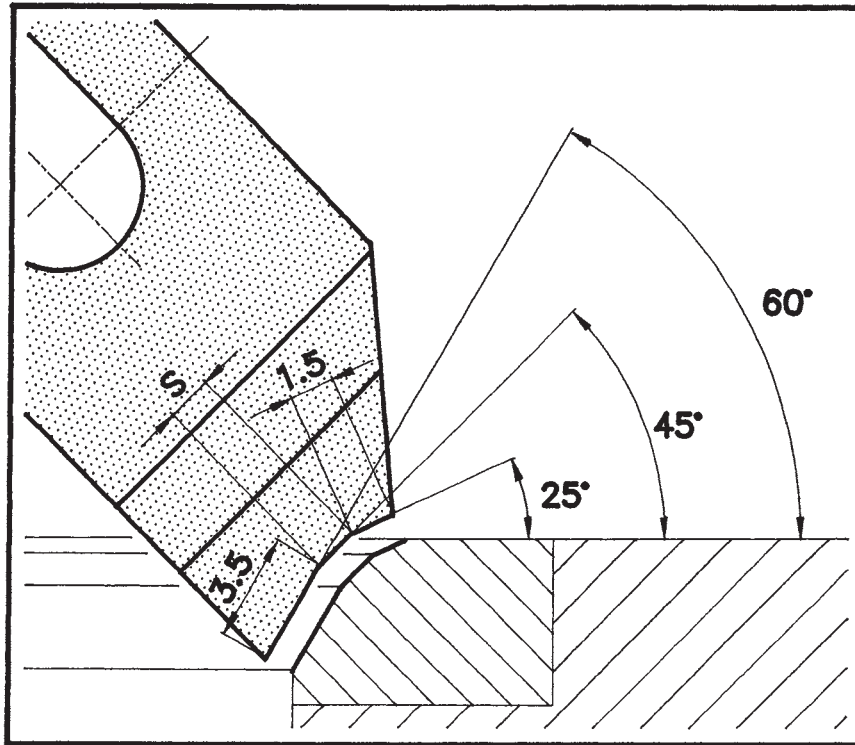
mira formtool list
mira Formstahlliste

Specification		Seatwidth	Seatangle	Cutting angle	Lower correction	1. Upper correction		2. Upper correction		Page		
Bezeichnung		Sitzbreite	Sitzwinkel	Schnittwinkel	Untere Korrektur	1. Obere Korrektur		2. Obere Korrektur		Seite		
		s	∠	∠	∠	L	∠	L	∠	L		
T	4535BX	5.0/30°	5.0	30°30'	3°	60°	4.0				29	
	4538B	2.0/30°	2.0	30°30'	3°	70°	3.0	0°	0.5	30°	7.5	29
	4539B	2.8/30°	2.8	30°30'	3°	60°	3.5	0°	0.6	30°	6.0	29
	4542B	2.0/35°	2.0	35°30'	3°	70°	3.2	7°	1.0			32
T	4543BX	1.5/30°	1.5	30°30'	3°	75°	4.0	15°	3.5			28
	4544B	3.25/20°	3.25	20°30'	3°	60°	6.2					31
T	4544BX	3.25/20°	3.25	20°30'	3°	60°	6.2					31
	4544D	3.25/20°	3.25	20°30'	3°	60°	6.2					31
	4547B	1.5/30°	1.5	30°30'	3°	75°	5.0	15°	1.5			28
T	4549BX	3.0/30°	3.0	30°30'	3°	65°	3.5	23°	1.5	R1.5		29
T	4552BX	3.0/20°	3.0	20°30'	3°	60°	3.5	15°	1.5			31
	4557B	4.5/30°	4.5	30°30'	3°			0°	0.4	45°	7.3	29
	4558B	2.0/37.5°	2.0	37.5°	3°	60°	3.5	15°	1.5			32
	4567B	9.0/30°	9.0	30°30'	3°			0°	0.5			30



Standard formtools
Standard-Formstähle
Outils de façon standard
Standard skärstål
Utensili ad angolazione multipla standard
Cuchillas de mandrinado moldeada standard

45°

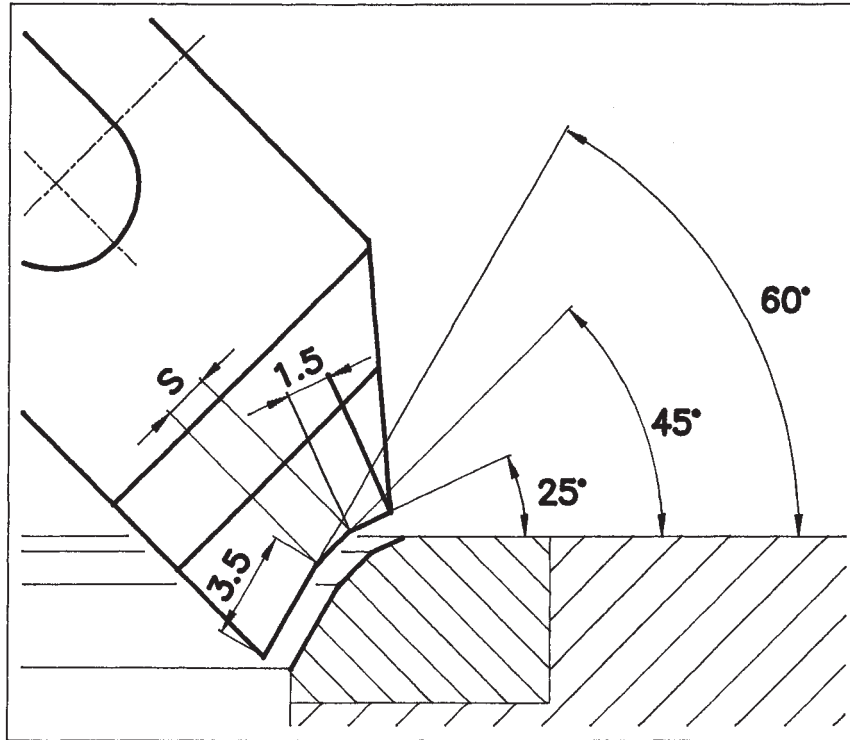


mira reference	Seat width	Seat angle
115A 1.5/45°	1.5	45°30'
120A 2.0/45°	2.0	45°30'
125B 2.5/45°	2.5	45°30'



Formtools
 Formstähle
 Outils de façon
 Skärstål
 Utensili ad angolazione multipla
 Cuchillas de mandrinado moldeada

45°



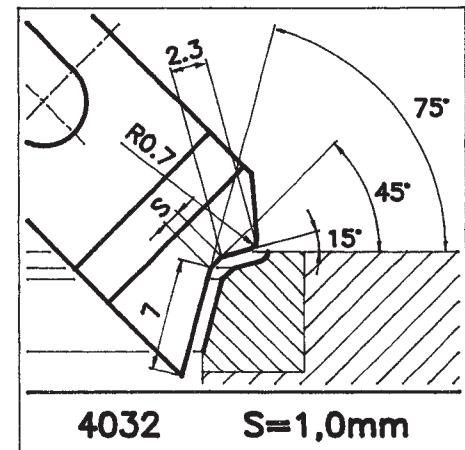
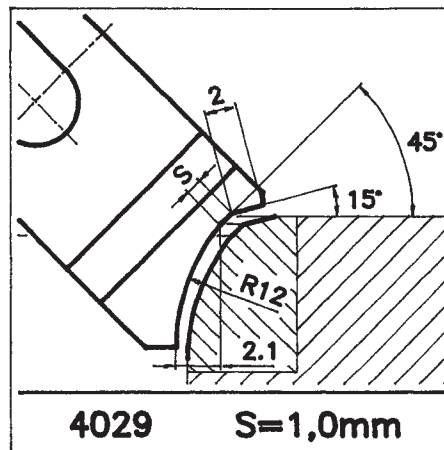
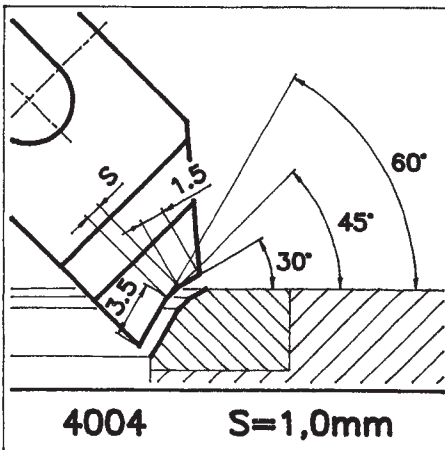
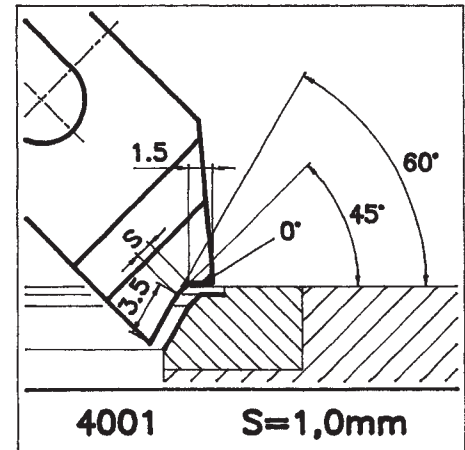
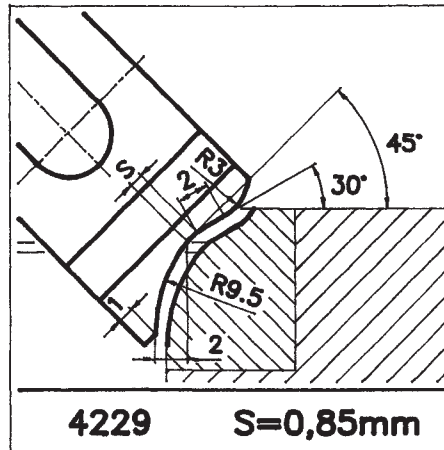
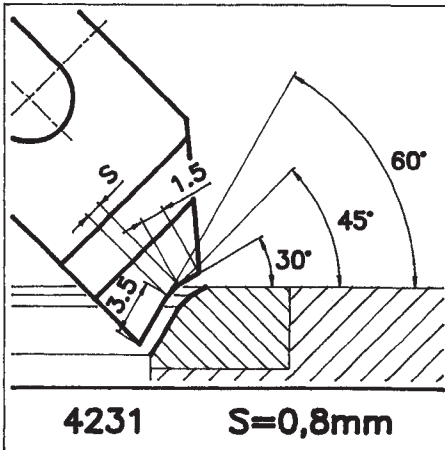
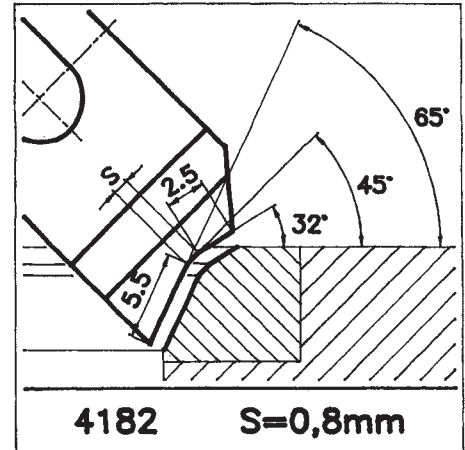
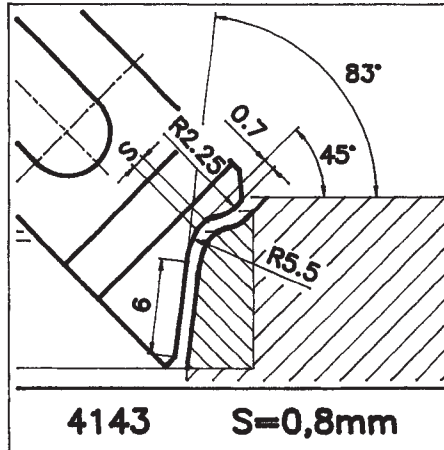
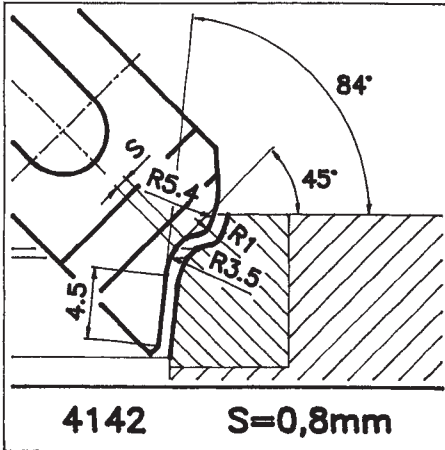
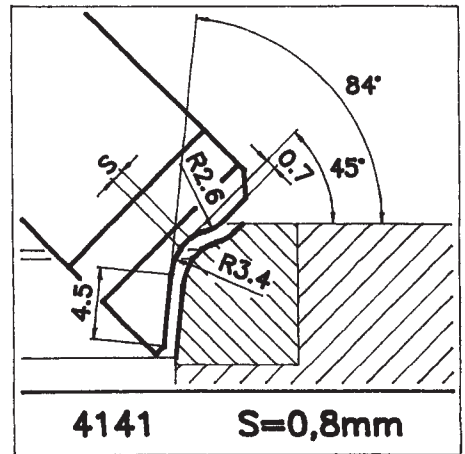
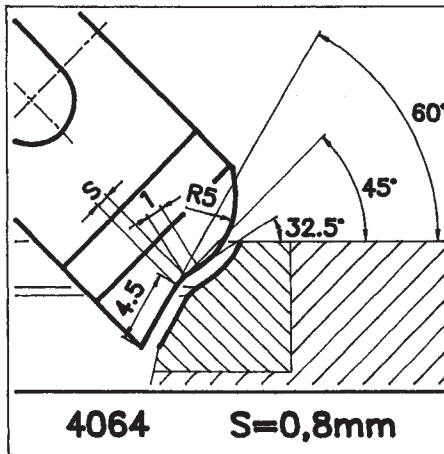
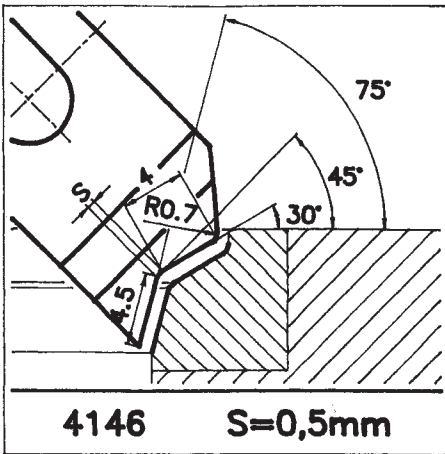
mira reference	Seat width	Seat angle
105C	0.5/45°	0.5 45°30'
107C	0.7/45°	0.7 45°30'
108A	0.8/45°	0.8 45°30'
108B	0.8/45°	0.8 45°30'
108C	0.8/45°	0.8 45°30'
T 108CX	0.8/45°	0.8 45°30'
110A	1.0/45°	1.0 45°30'
T 110AX	1.0/45°	1.0 45°30'
110B	1.0/45°	1.0 45°30'
T 110BX	1.0/45°	1.0 45°30'
110C	1.0/45°	1.0 45°30'
T 110CX	1.0/45°	1.0 45°30'
T 115AX	1.5/45°	1.5 45°30'
115B	1.5/45°	1.5 45°30'
T 115BX	1.5/45°	1.5 45°30'
115C	1.5/45°	1.5 45°30'
T 115CX	1.5/45°	1.5 45°30'
115D	1.5/45°	1.5 45°30'

mira reference	Seat width	Seat angle
T 120AX	2.0/45°	2.0 45°30'
120B	2.0/45°	2.0 45°30'
T 120BX	2.0/45°	2.0 45°30'
120D	2.0/45°	2.0 45°30'
125A	2.5/45°	2.5 45°30'
T 125BX	2.5/45°	2.5 45°30'
125D	2.5/45°	2.5 45°30'
130B	3.0/45°	3.0 45°30'
T 130BX	3.0/45°	3.0 45°30'
135B	3.5/45°	3.5 45°30'
135D	3.5/45°	3.5 45°30'
140B	4.0/45°	4.0 45°30'



Formtools
 Formstähle
 Outils de façon
 Skärstål
 Utensili ad angolazione multipla
 Cuchillas de mandrinado moldeada

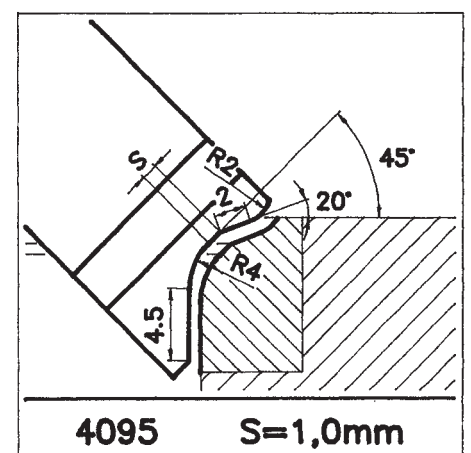
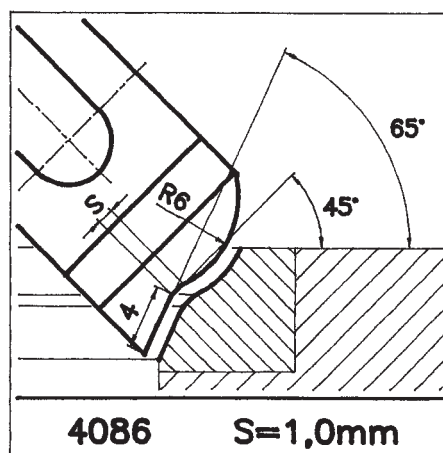
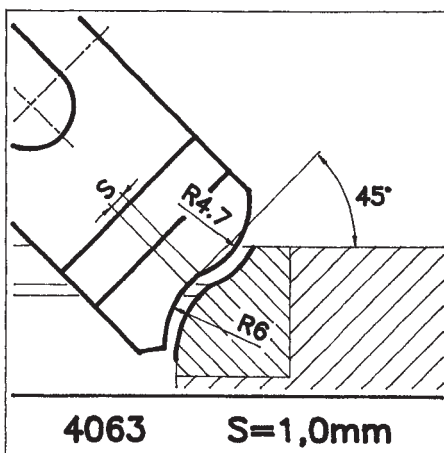
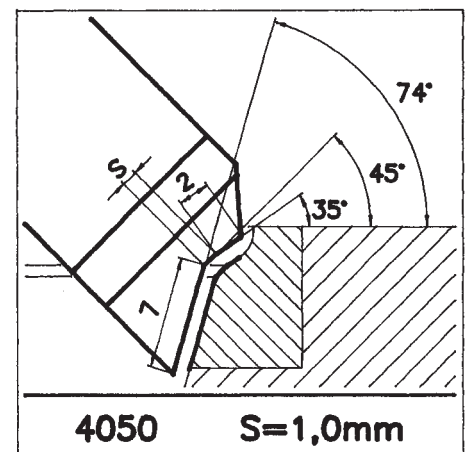
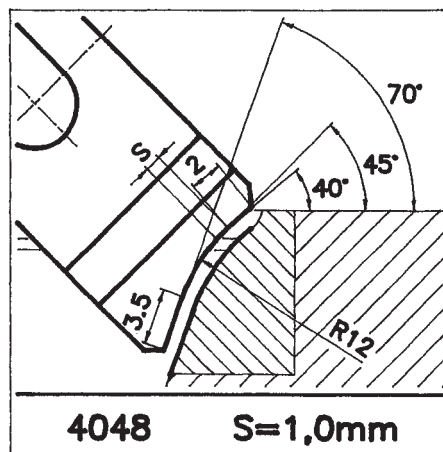
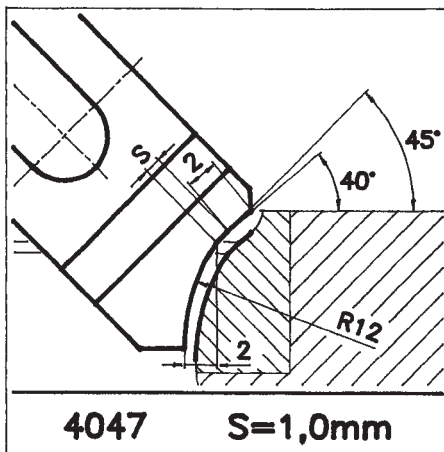
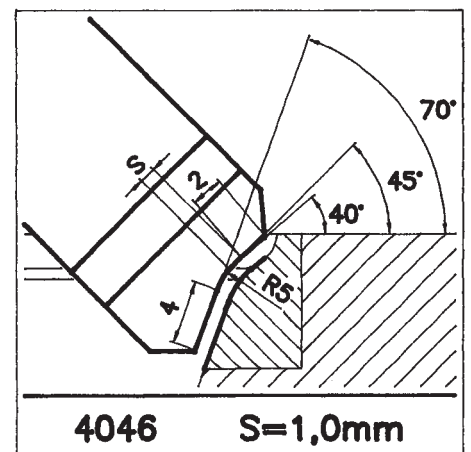
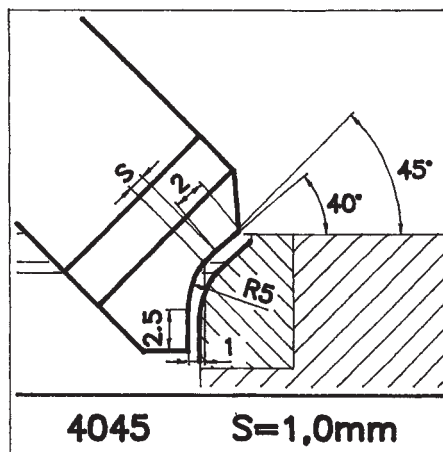
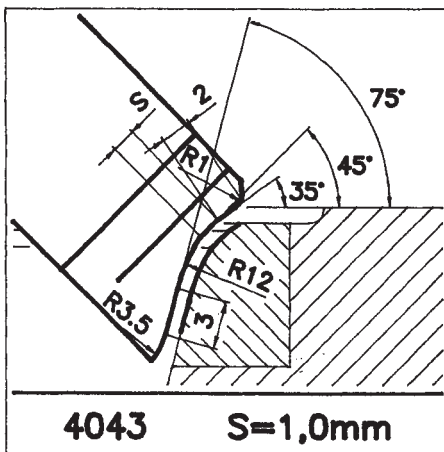
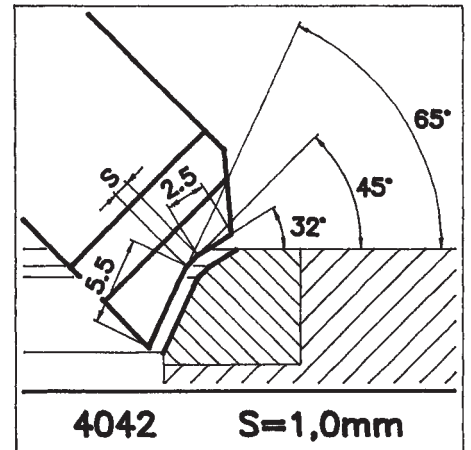
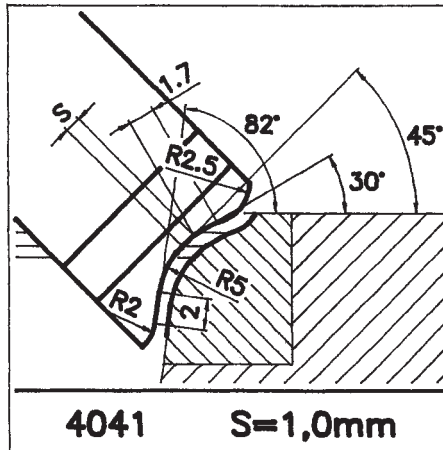
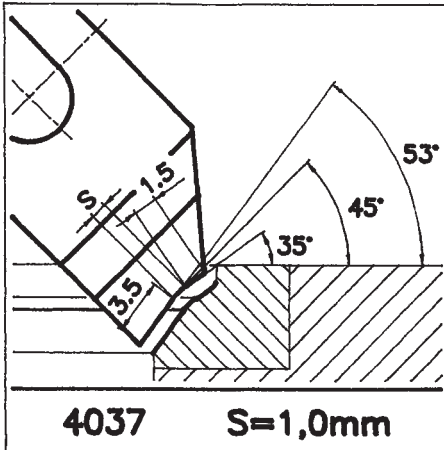
45°





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Skärstål
Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

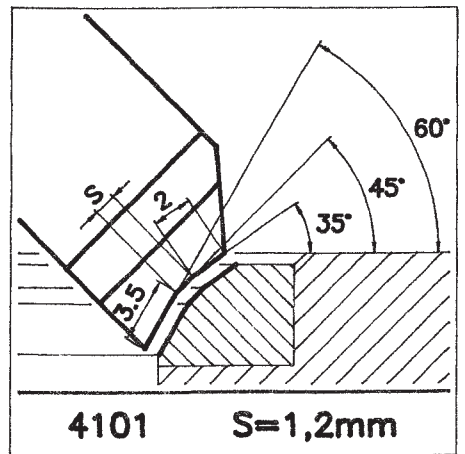
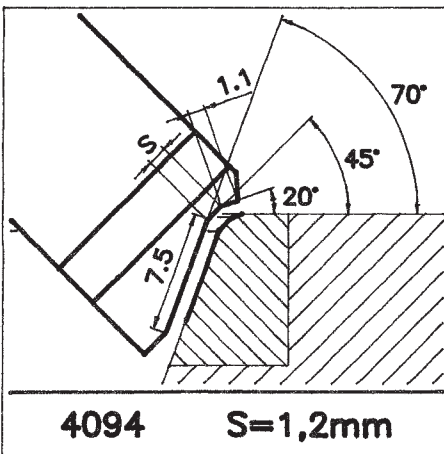
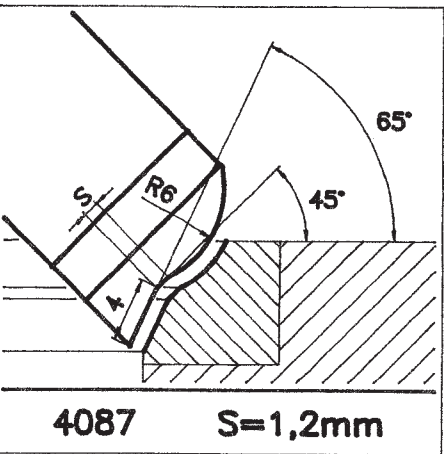
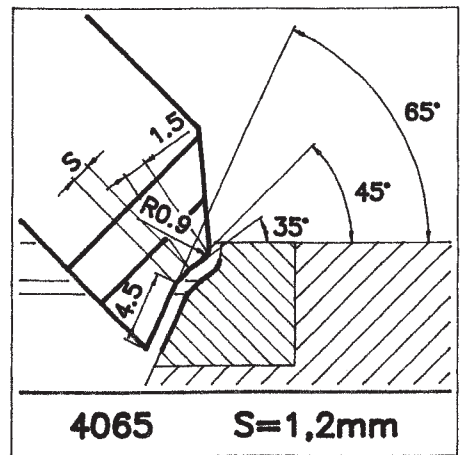
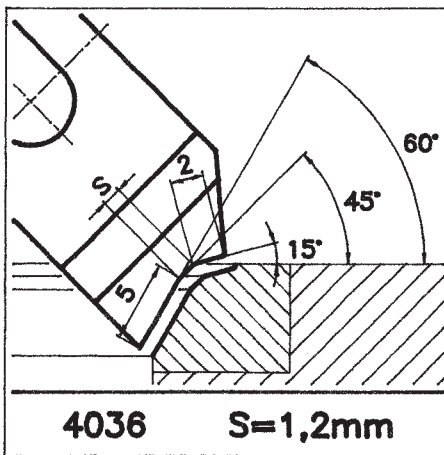
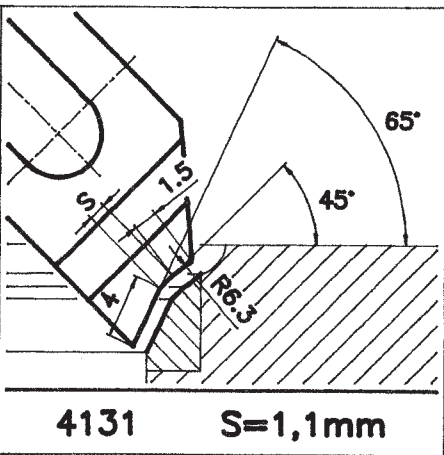
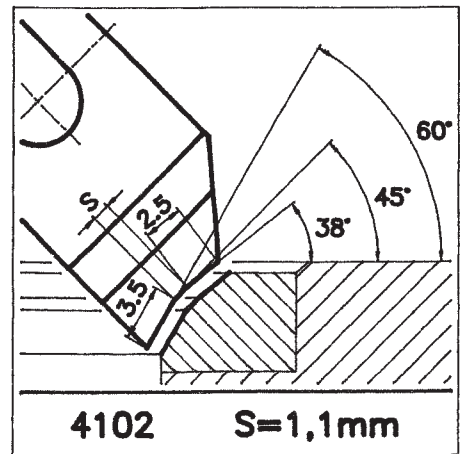
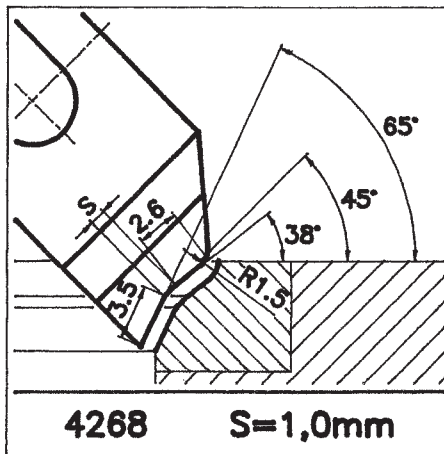
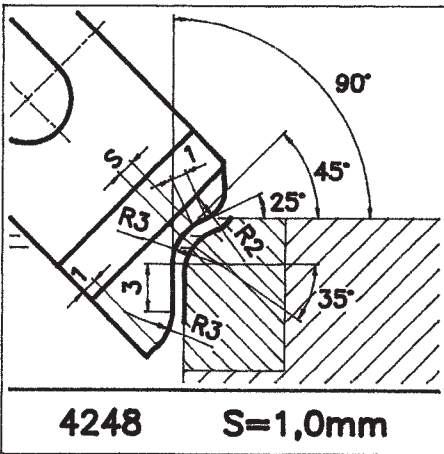
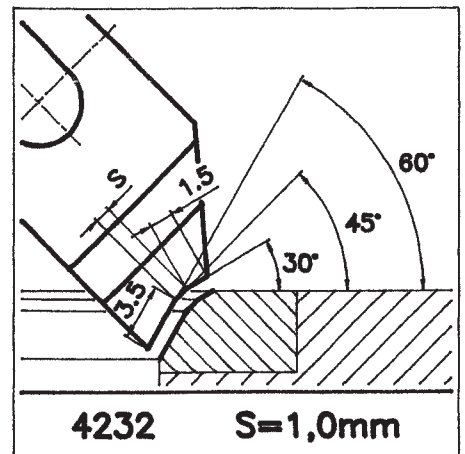
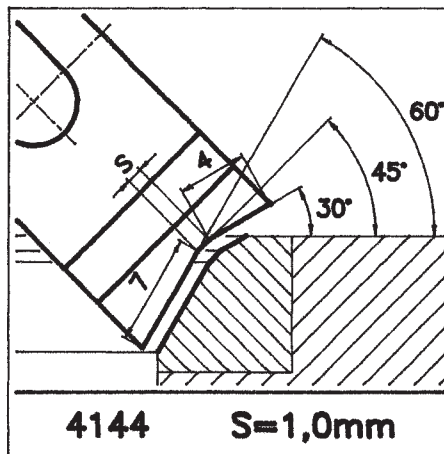
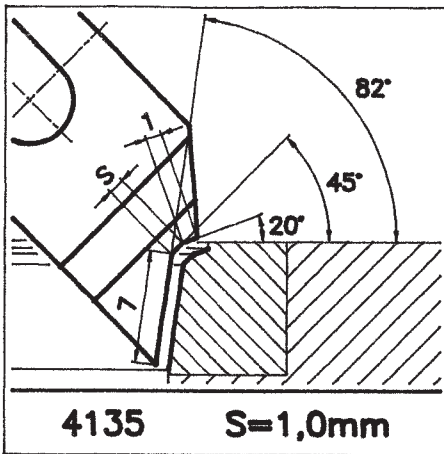
45°





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Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

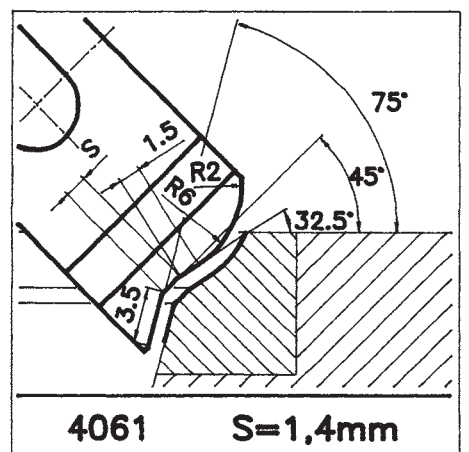
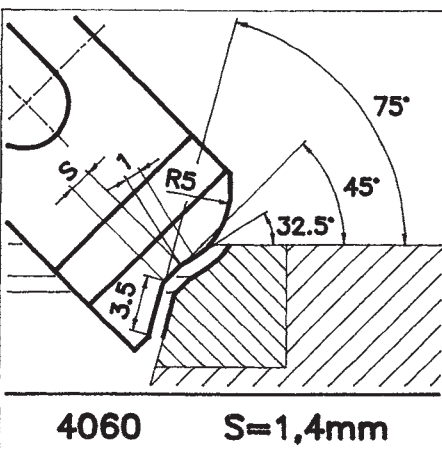
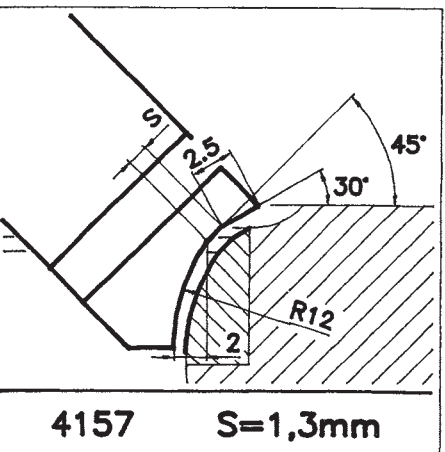
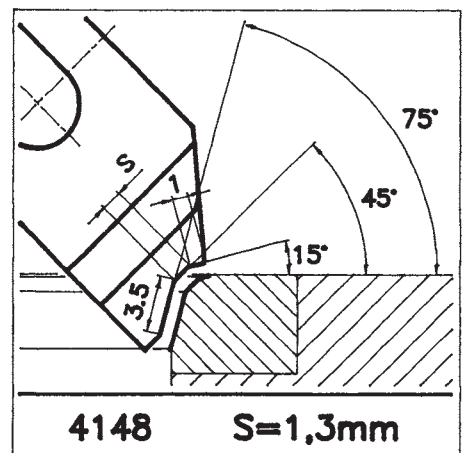
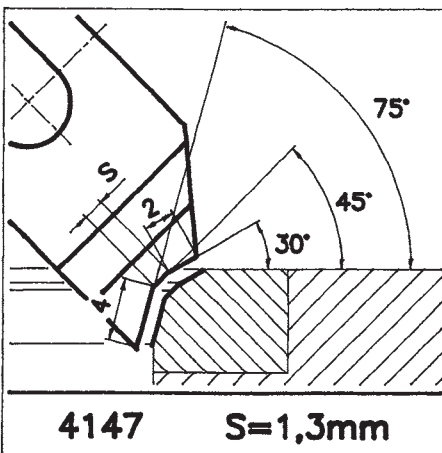
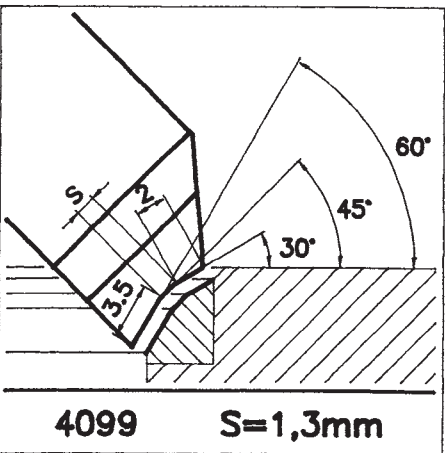
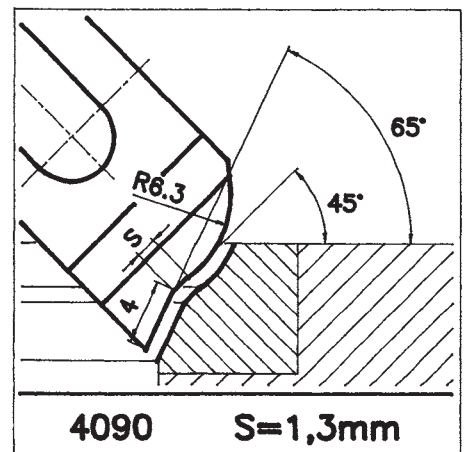
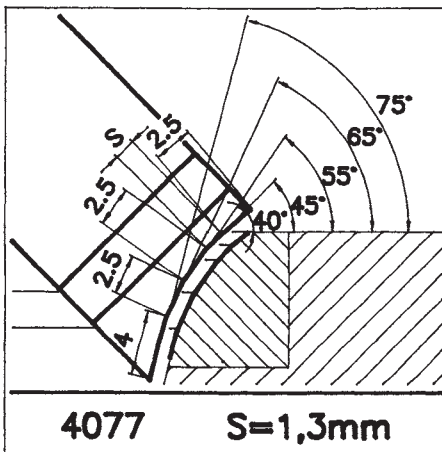
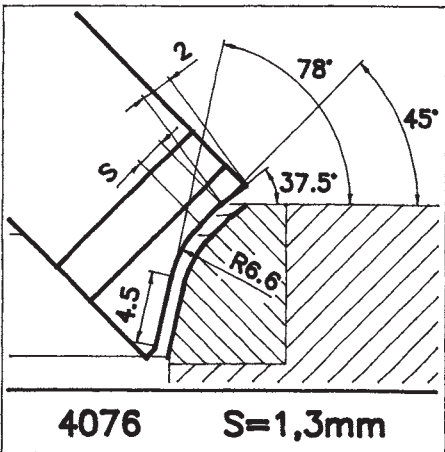
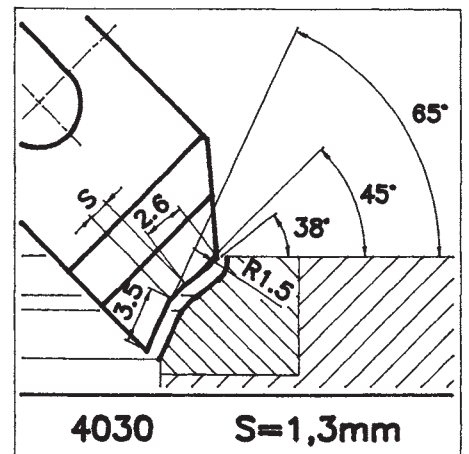
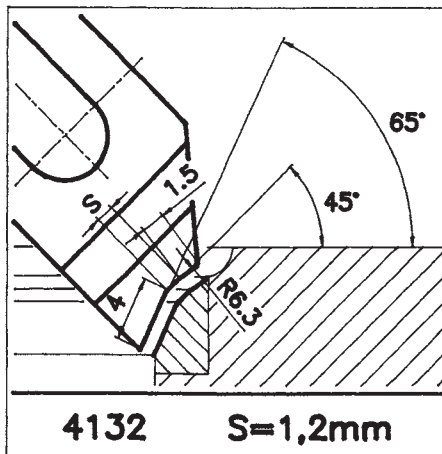
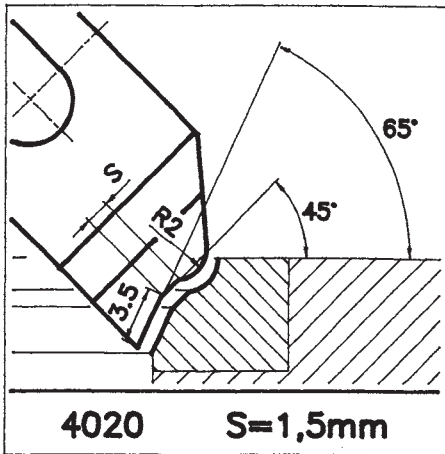
45°





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Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

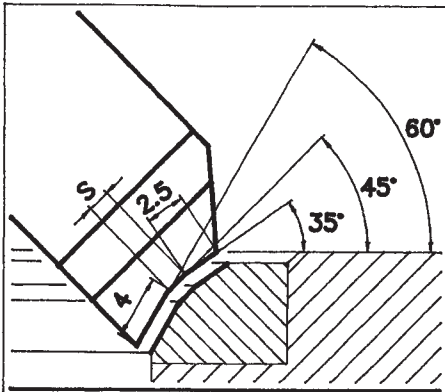
45°



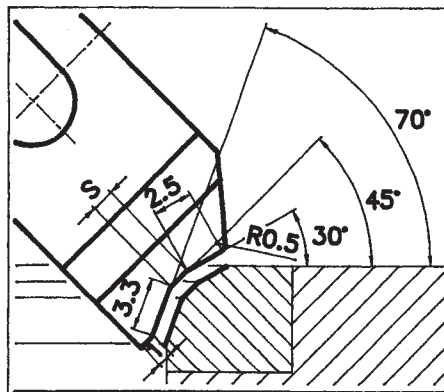


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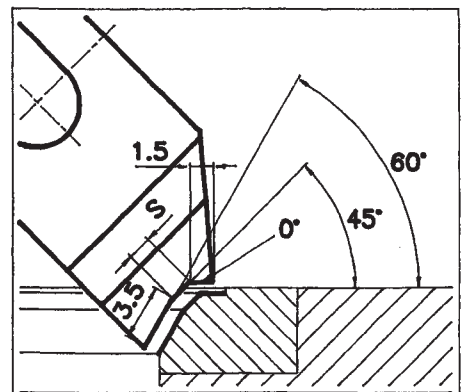
45°



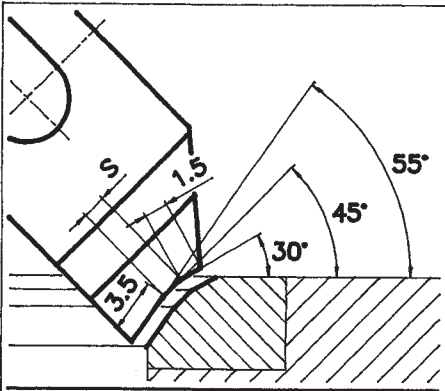
4100 S=1,4mm



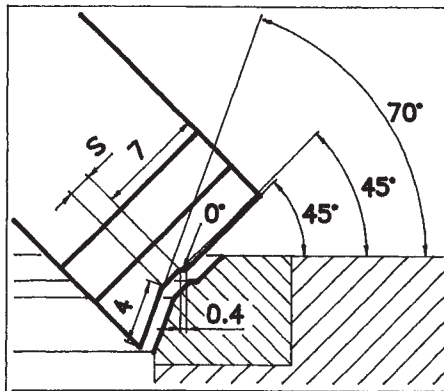
4203 S=1,4mm



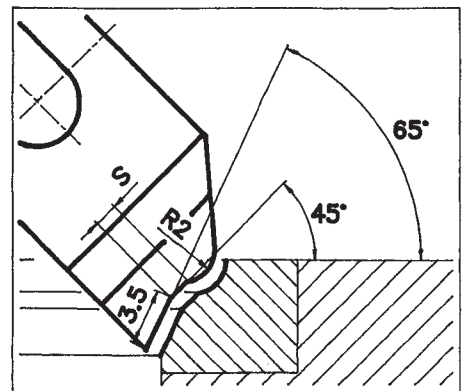
4002 S=1,5mm



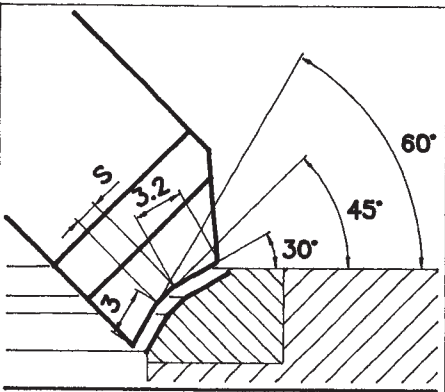
4005 S=1,5mm



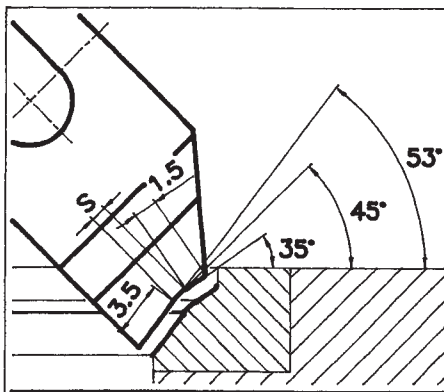
4018 S=1,5mm



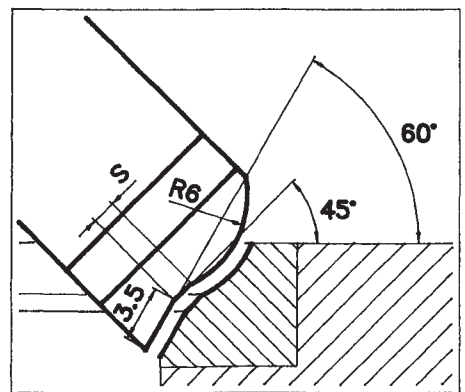
4020 S=1,5mm



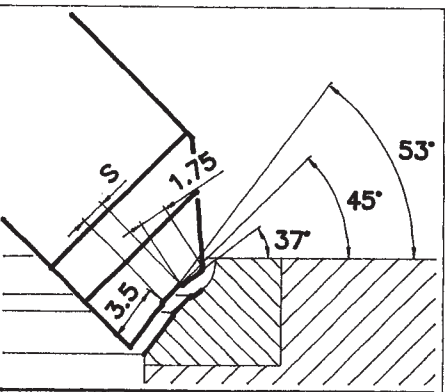
4033 S=1,5mm



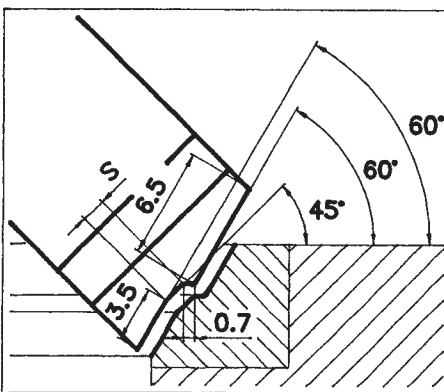
4038 S=1,5mm



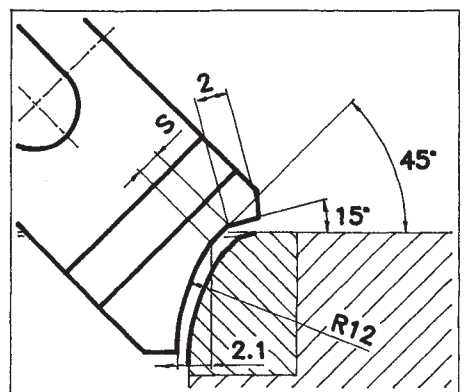
4052 S=1,5mm



4053 S=1,5mm



4058 S=1,5mm

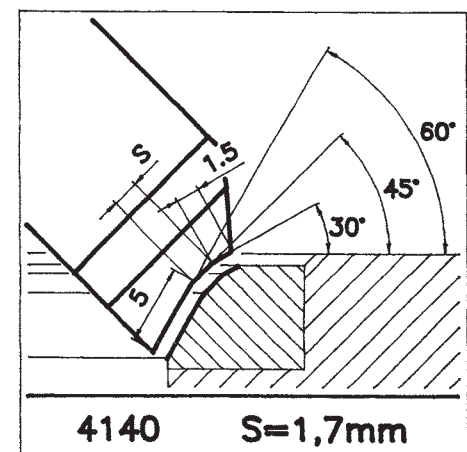
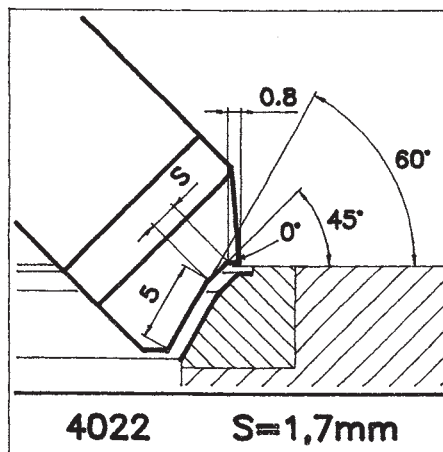
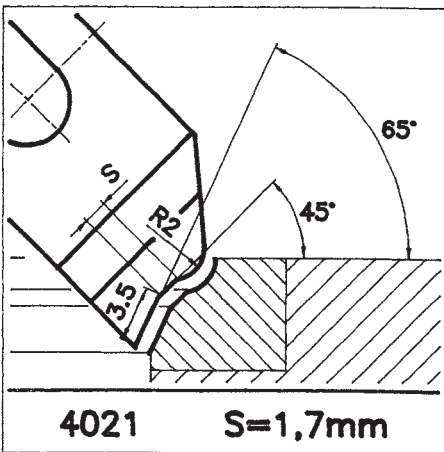
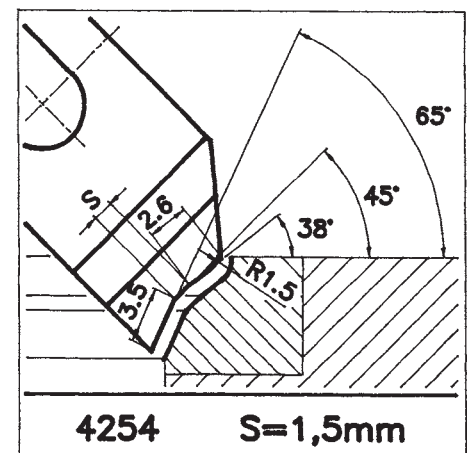
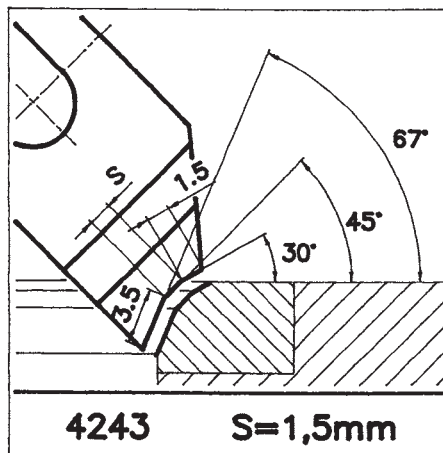
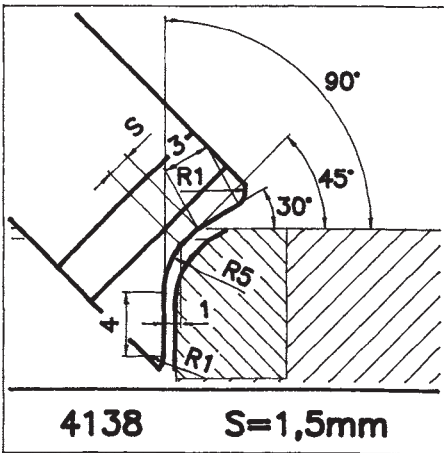
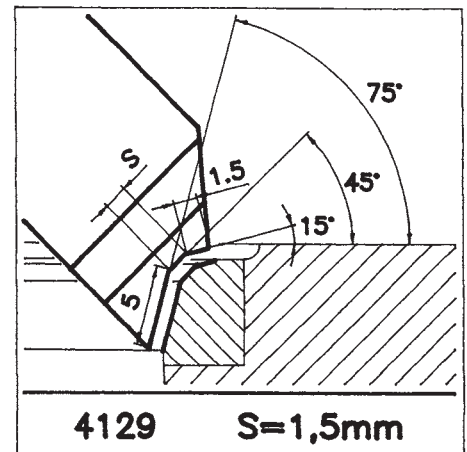
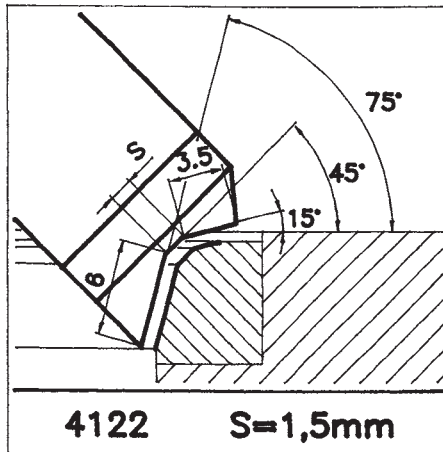
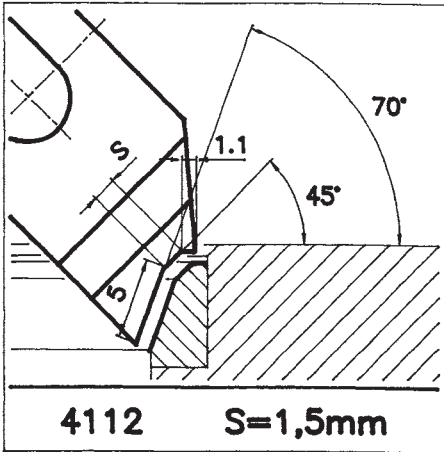
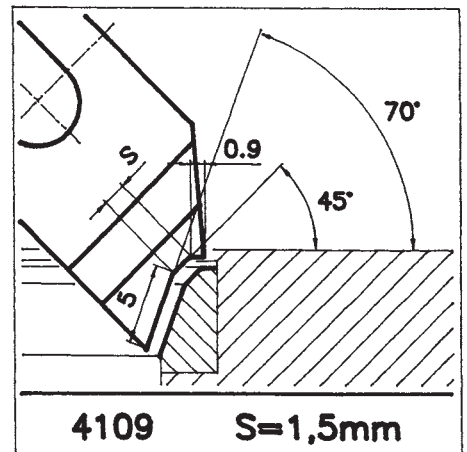
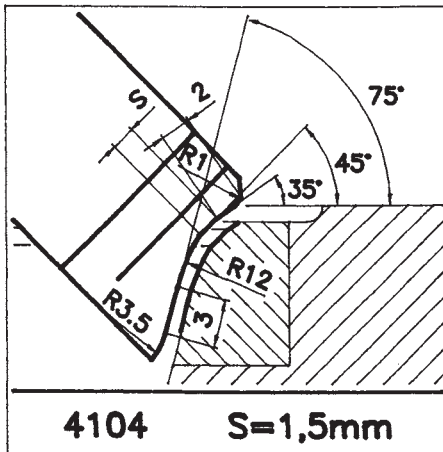
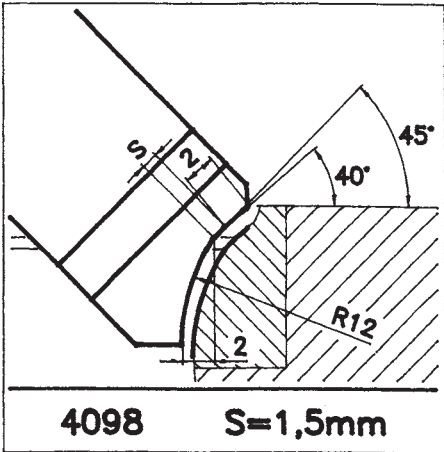


4074 S=1,5mm



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Skärstål
Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

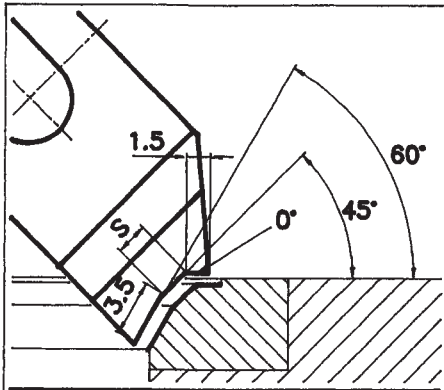
45°



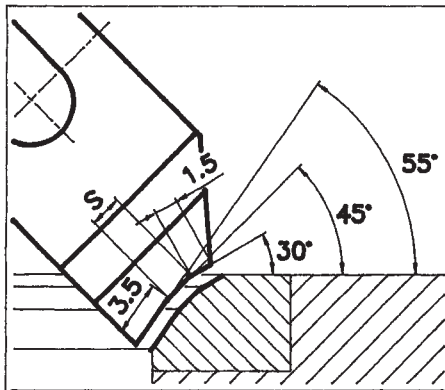


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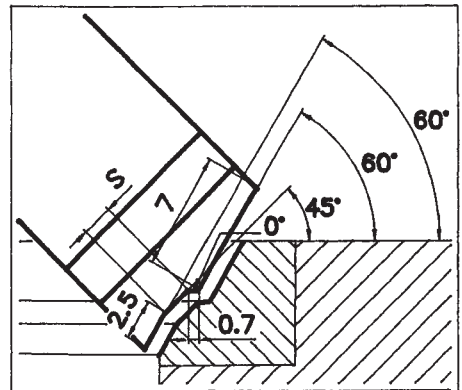
45°



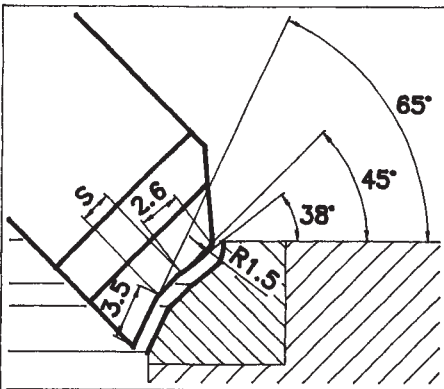
4003 S=2,0mm



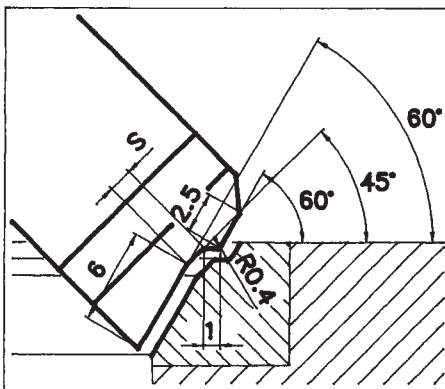
4006 S=2,0mm



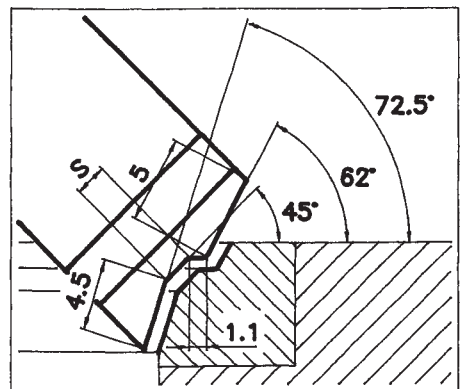
4012 S=2,0mm



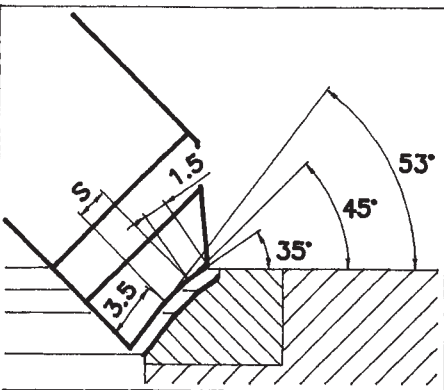
4025 S=2,0mm



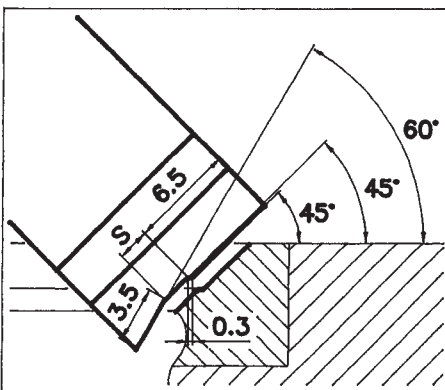
4027 S=2,0mm



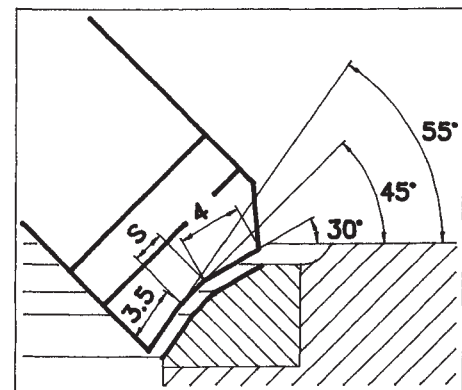
4034 S=2,0mm



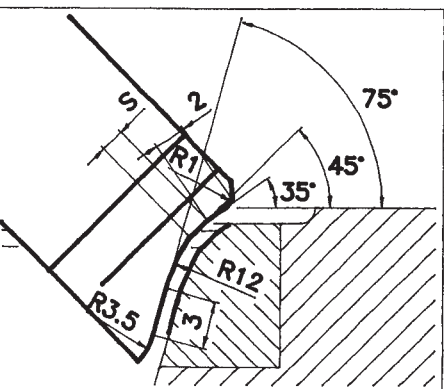
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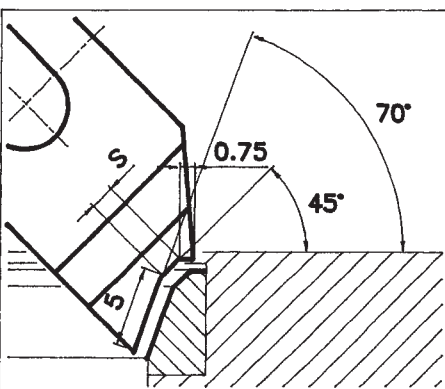
4080 S=2,0mm



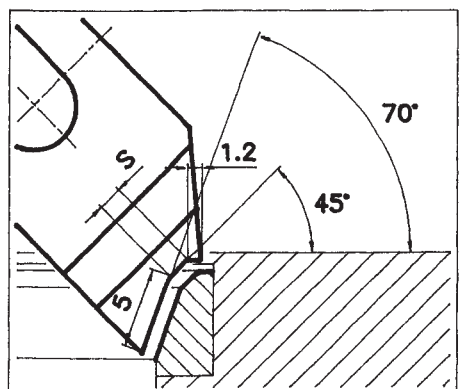
4081 S=2,0mm



4105 S=2,0mm



4110 S=2,0mm

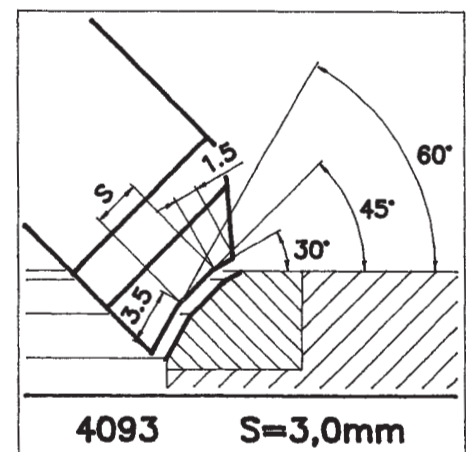
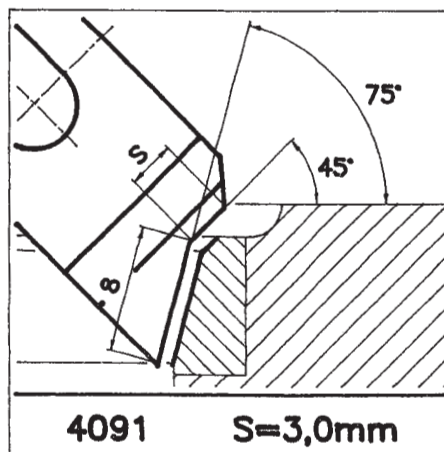
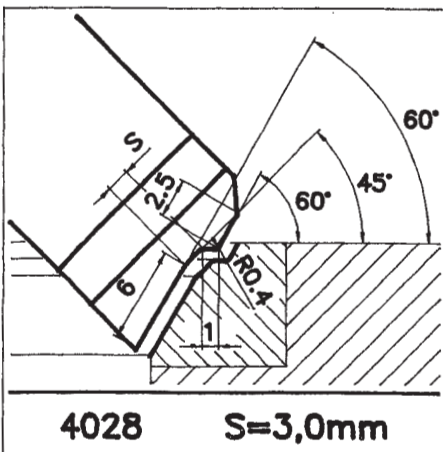
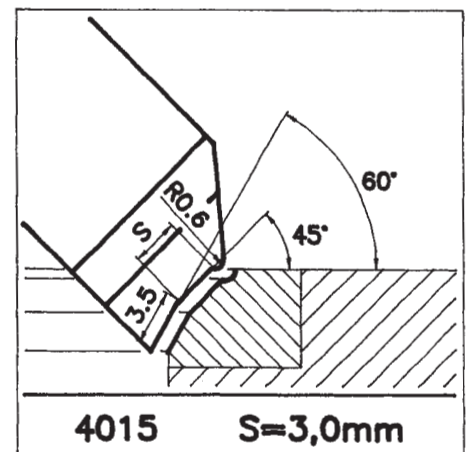
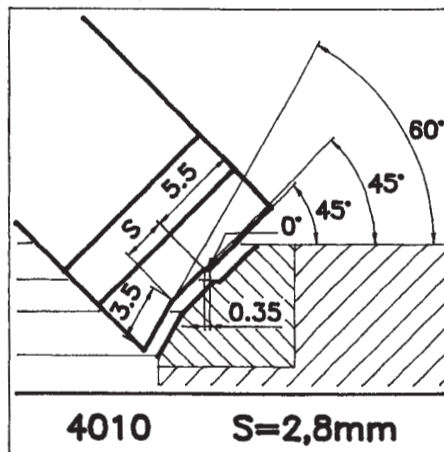
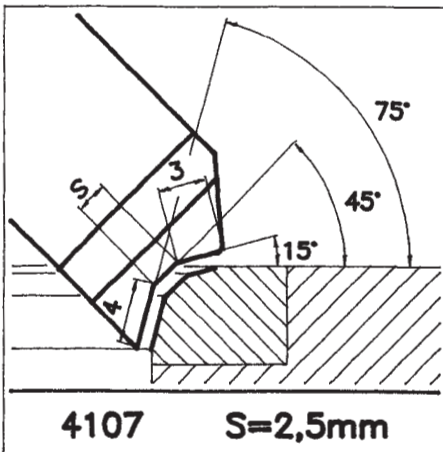
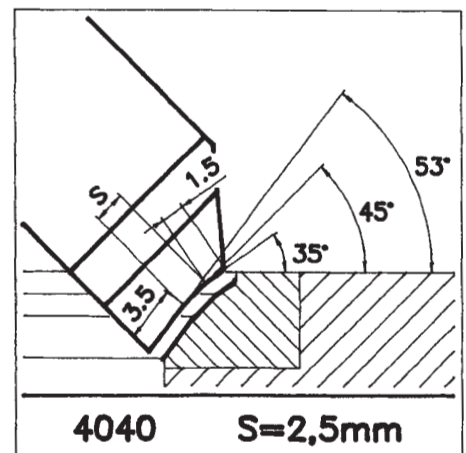
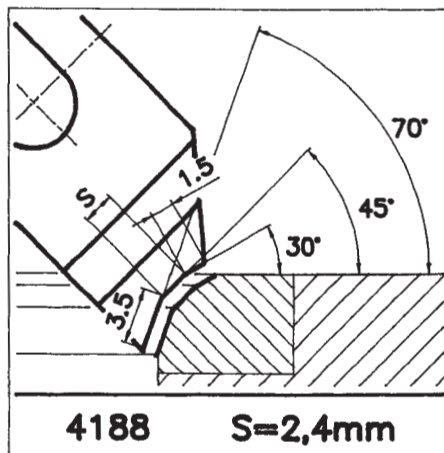
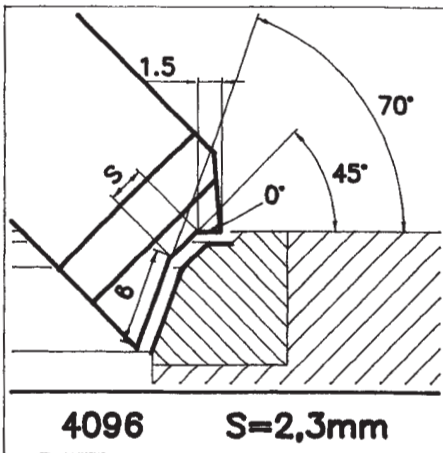
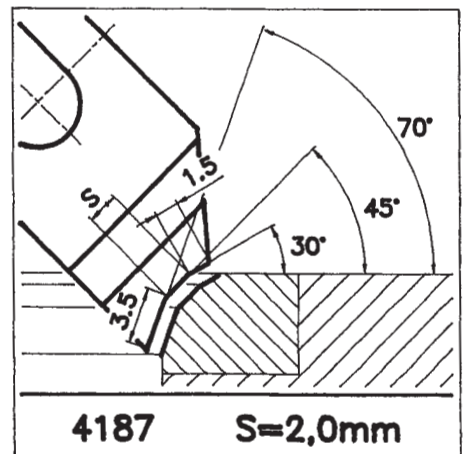
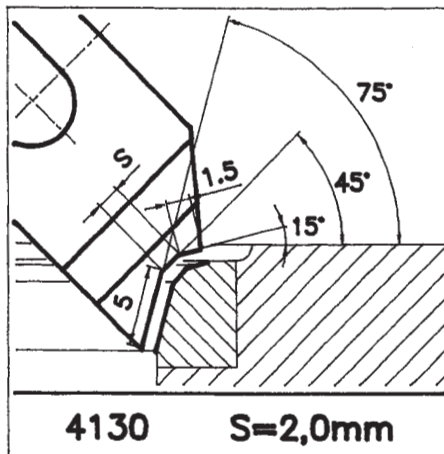
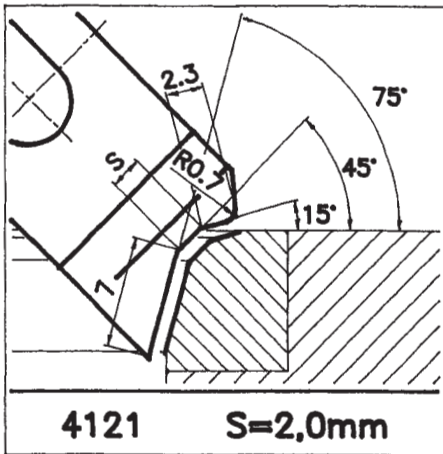


4111 S=2,0mm



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Skärstål
Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

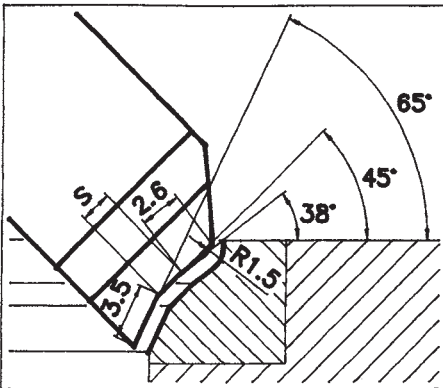
45°



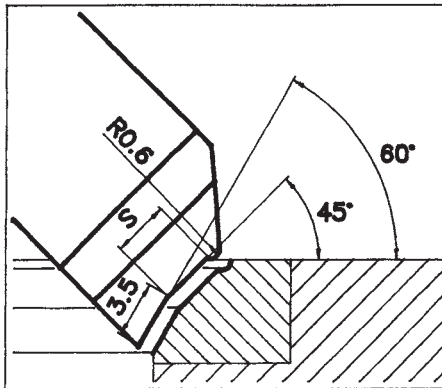
MIRA[®]

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Outils de façon
Skärstål

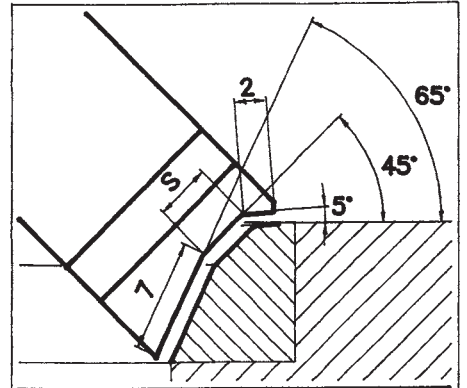
Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

45°

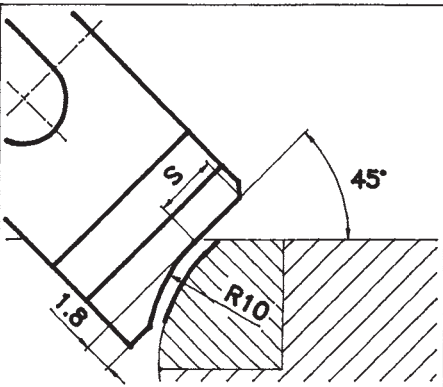
4139 S=3,0mm



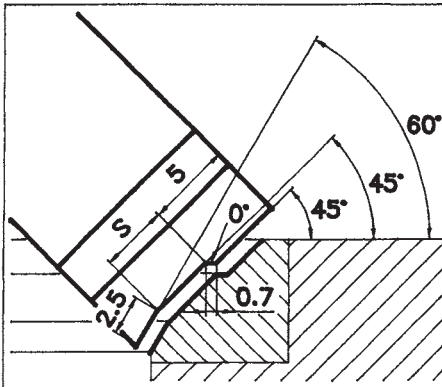
4016 S=3,5mm



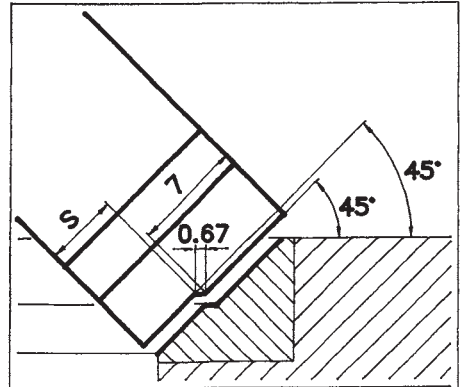
4150 S=3,5mm



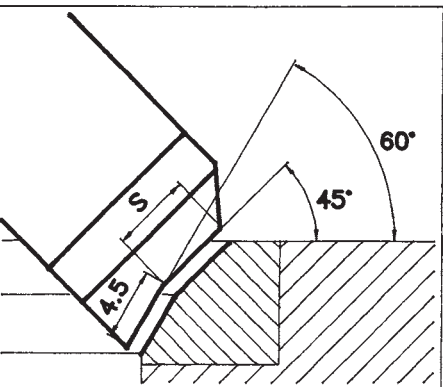
4092 S=4,0mm



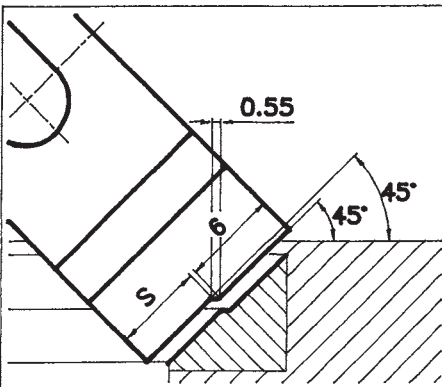
4011 S=4,2mm



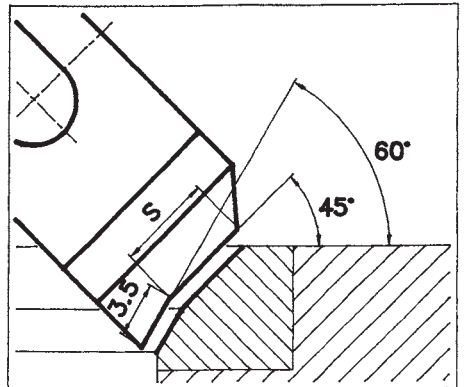
4158 S=4,5mm



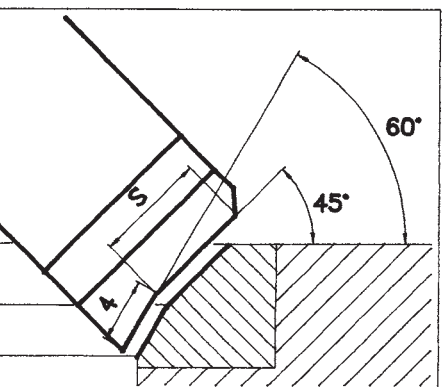
4023 S=5,0mm



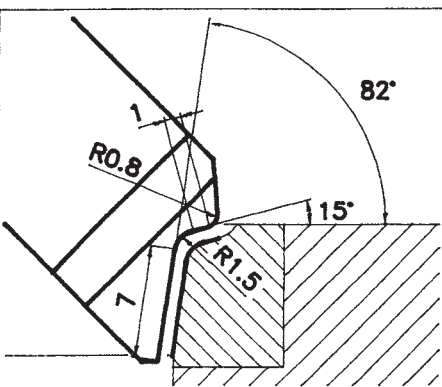
4159 S=5,5mm



4009 S=6,0mm



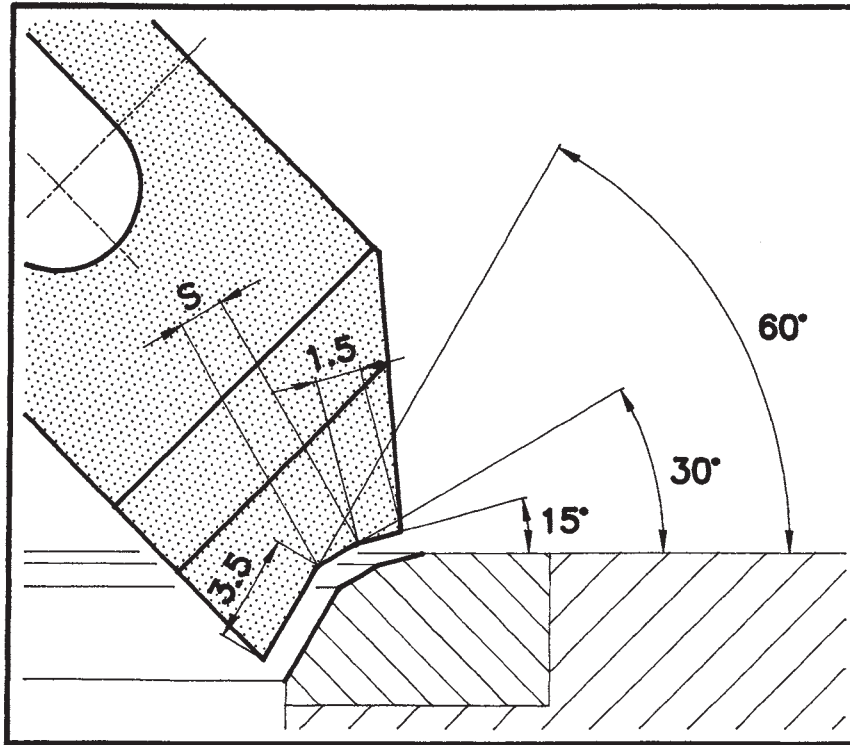
4072 S=7,0mm



4136

MIRA®

Standard formtools
Standard-Formstähle
Outils de façon standard
Standard skärstål
Utensili ad angolazione multipla standard
Cuchillas de mandrinado moldeada standard

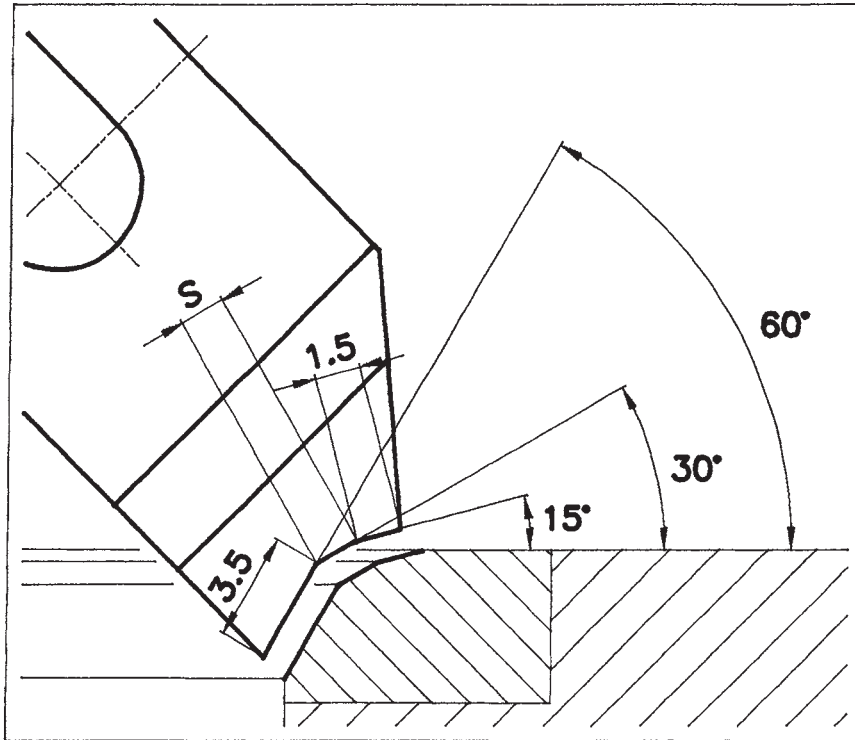
30°

mira reference	Seat width	Seat angle
215A 1.5/30°	1.5	30°30'
220A 2.0/30°	2.0	30°30'
225B 2.5/30°	2.5	30°30'



Formtools
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 Skärstål
 Utensili ad angolazione multipla
 Cuchillas de mandrinado moldeada

30°



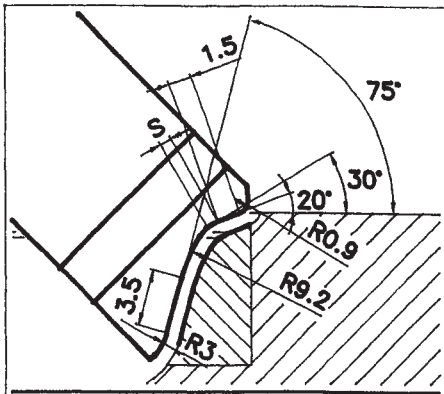
mira reference	Seat width	Seat angle
208C	0.8/30°	0.8 30°30'
210A	1.0/30°	1.0 30°30'
T 210AX	1.0/30°	1.0 30°30'
210B	1.0/30°	1.0 30°30'
T 210BX	1.0/30°	1.0 30°30'
210C	1.0/30°	1.0 30°30'
212B	1.2/30°	1.2 30°30'
T 215AX	1.5/30°	1.5 30°30'
215B	1.5/30°	1.5 30°30'
T 215BX	1.5/30°	1.5 30°30'
215C	1.5/30°	1.5 30°30'

mira reference	Seat width	Seat angle
T 220AX	2.0/30°	2.0 30°30'
220B	2.0/30°	2.0 30°30'
T 220BX	2.0/30°	2.0 30°30'
220D	2.0/30°	2.0 30°30'
T 225BX	2.5/30°	2.5 30°30'
225D	2.5/30°	2.5 30°30'
230B	3.0/30°	3.0 30°30'
T 230BX	3.0/30°	3.0 30°30'
230D	3.0/30°	3.0 30°30'
235B	3.5/30°	3.5 30°30'
240B	4.0/30°	4.0 30°30'

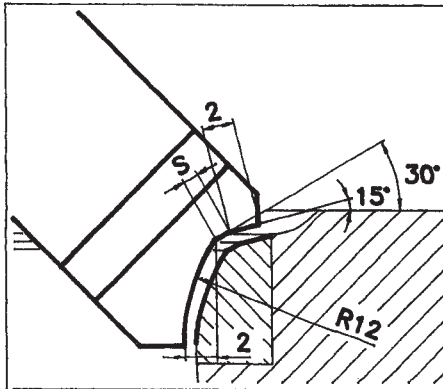


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Cuchillas de mandrinado moldeada

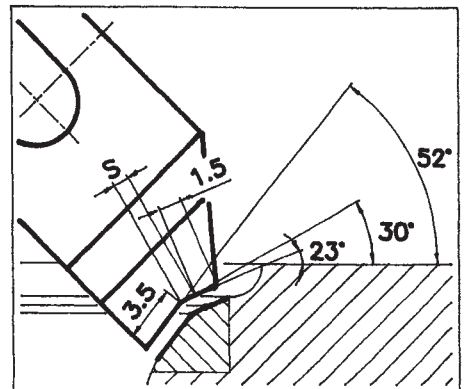
30°



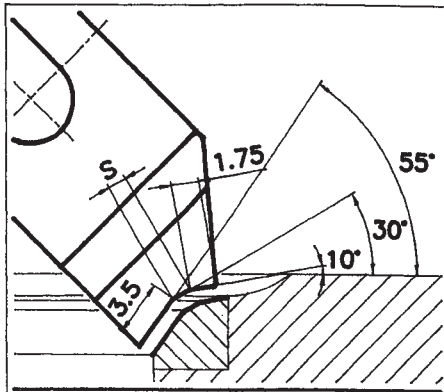
4520 S=0,75mm



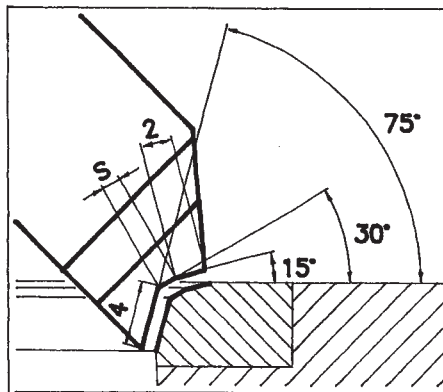
4510 S=1,0mm



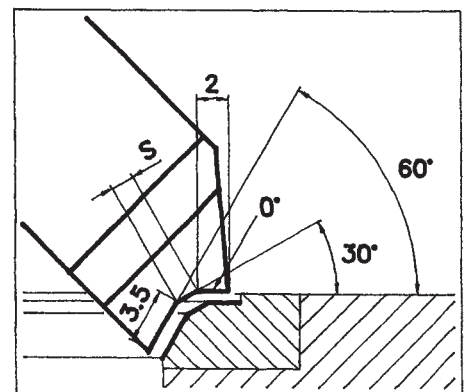
4514 S=1,0mm



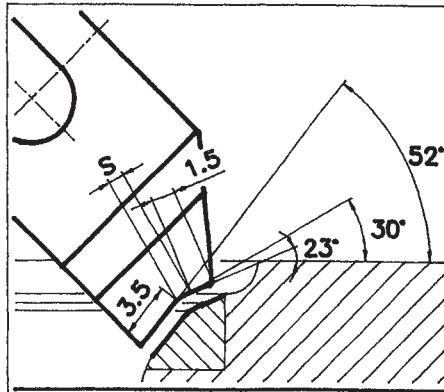
4518 S=1,2mm



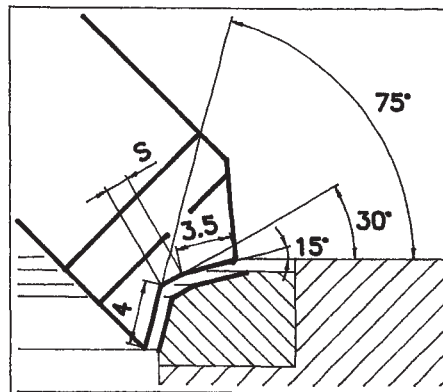
4530 S=1,2mm



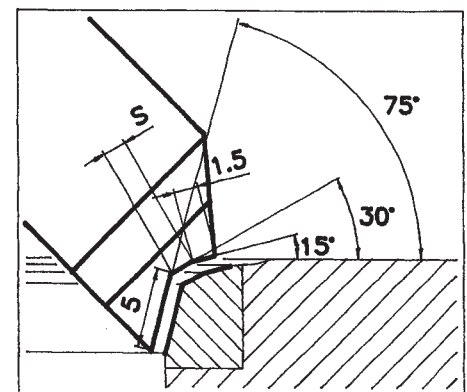
4504 S=1,5mm



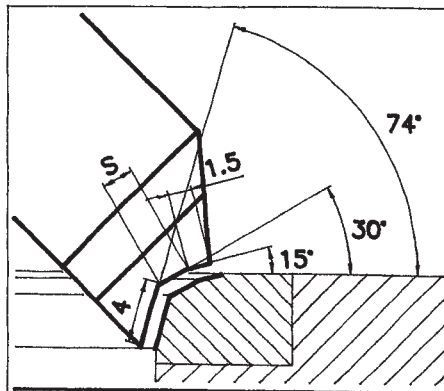
4515 S=1,5mm



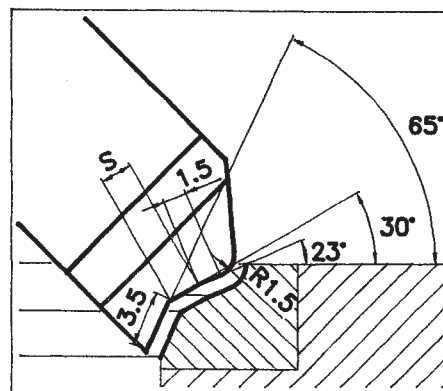
4543 S=1,5mm



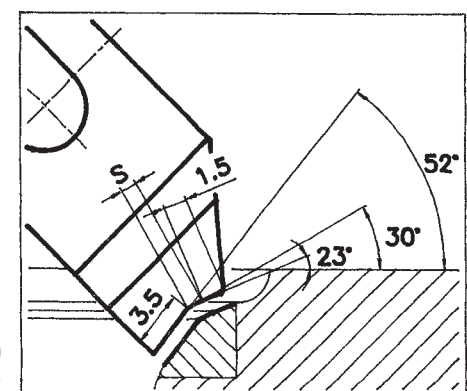
4547 S=1,5mm



4502 S=2,0mm



4509 S=2,0mm

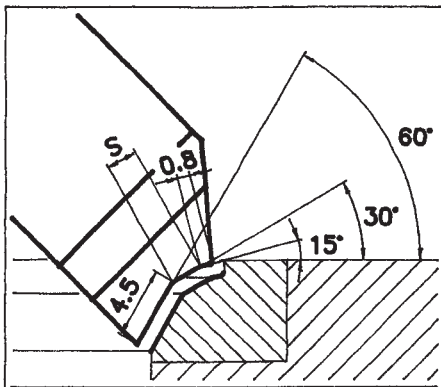


4516 S=2,0mm

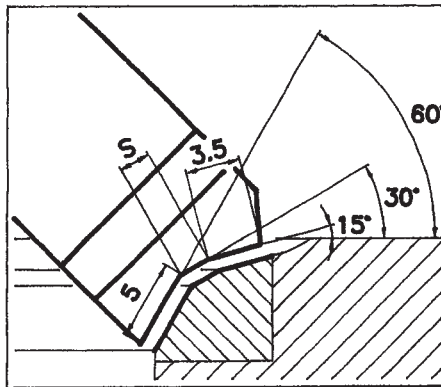


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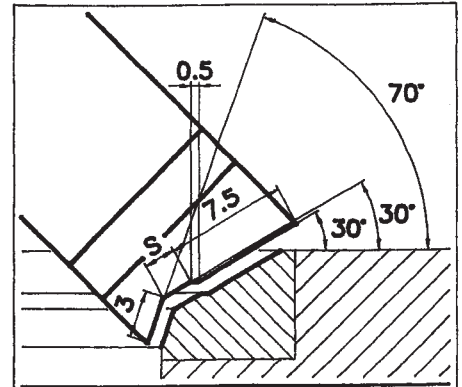
30°



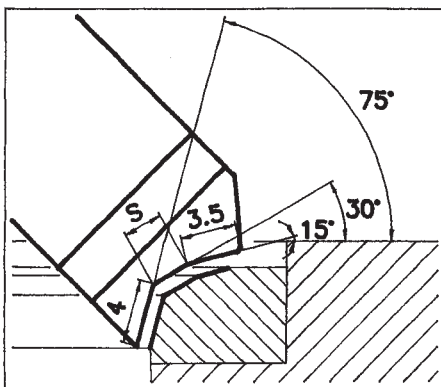
4525 S=2,0mm



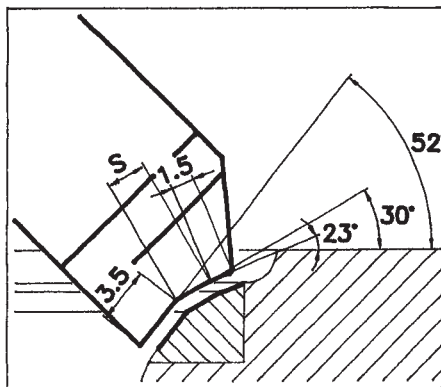
4526 S=2,0mm



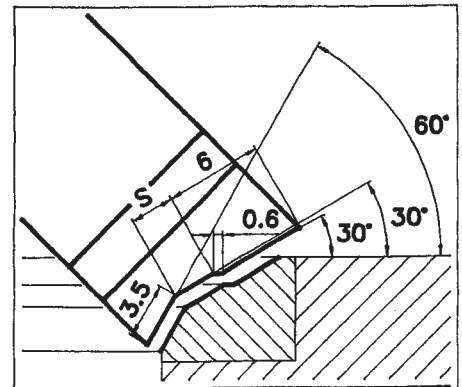
4538 S=2,0mm



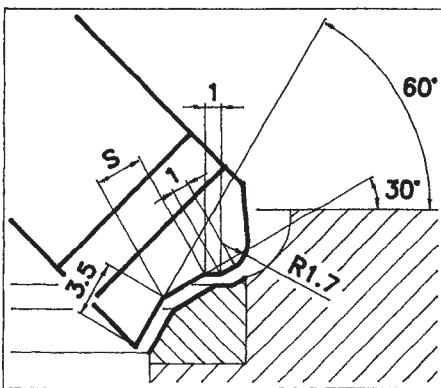
4512 S=2,5mm



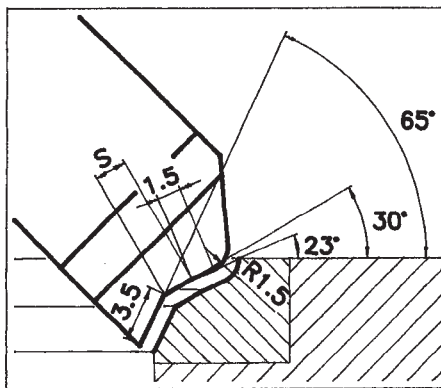
4517 S=2,5mm



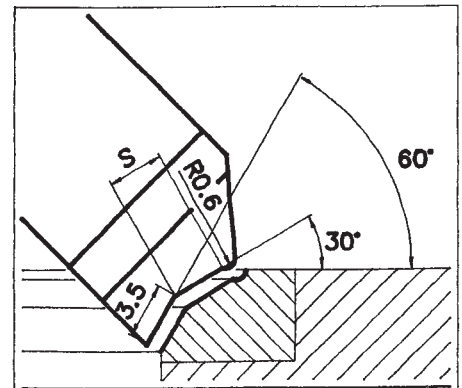
4539 S=2,8mm



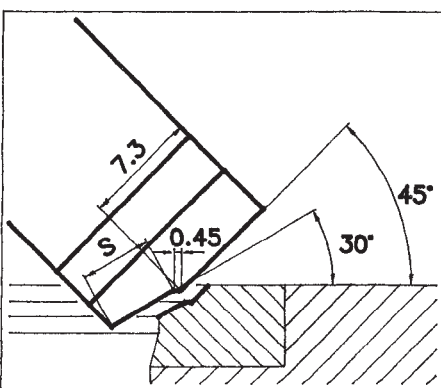
4519 S=3,0mm



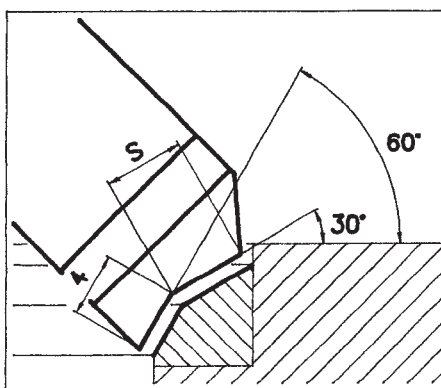
4549 S=3,0mm



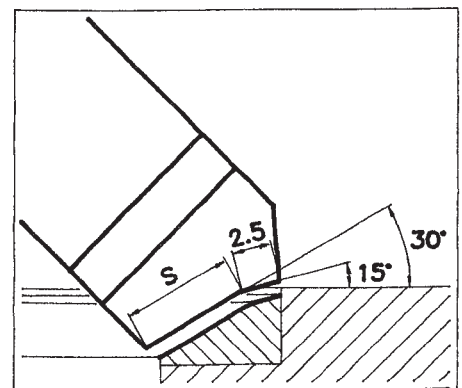
4506 S=3,5mm



4557 S=4,5mm



4535 S=5,0mm

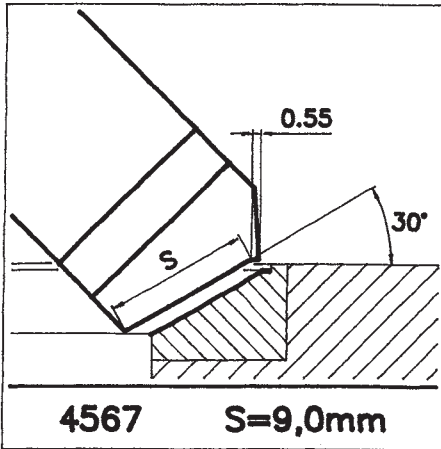


4531 S=7,0mm



Formtools
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Skärstål
Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

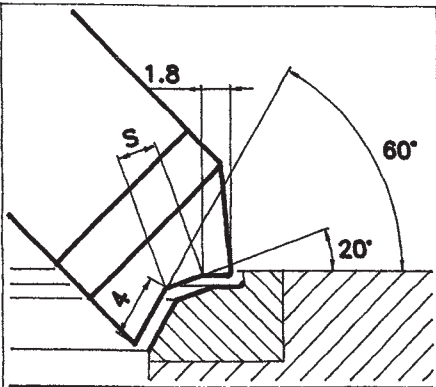
30°



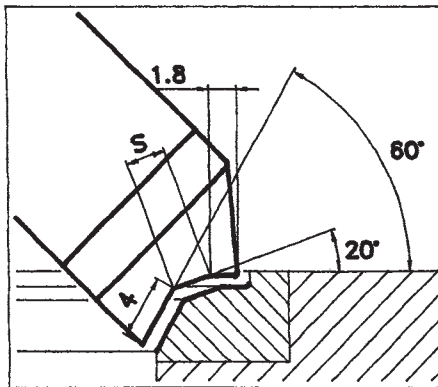


Formtools
Formstähle
Outils de façon
Skärstål
Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

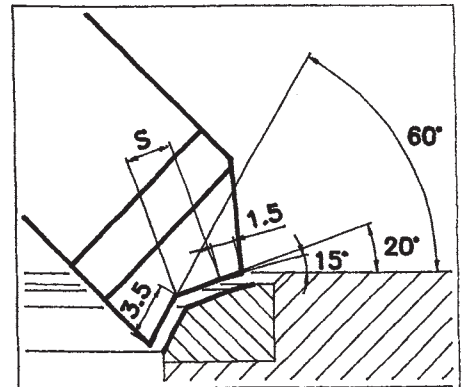
20°



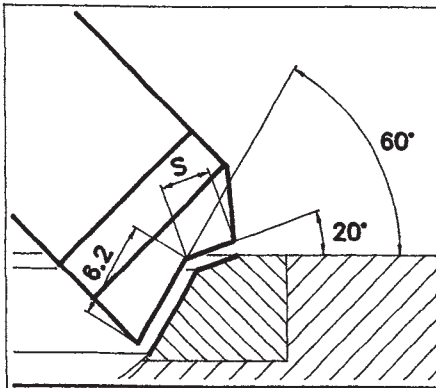
4524 S=2,0mm



4523 S=2,5mm



4552 S=3,0mm

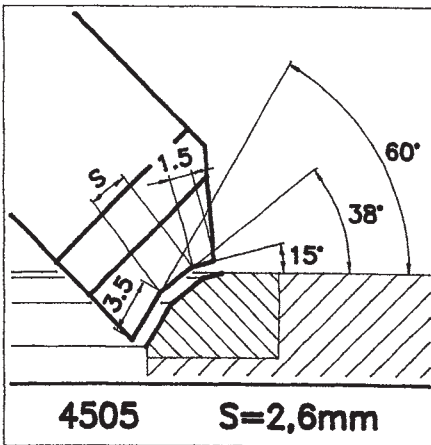
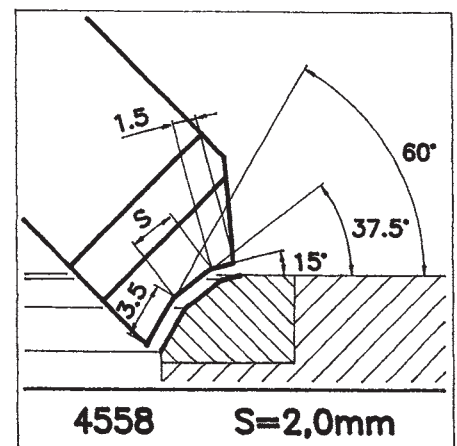
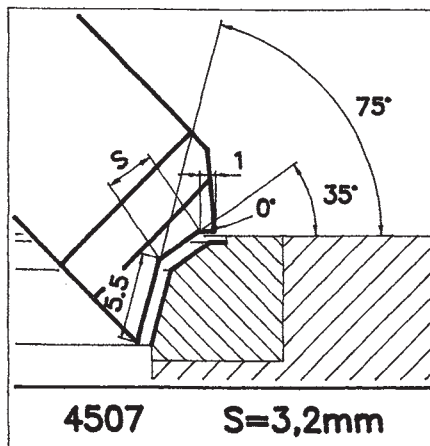
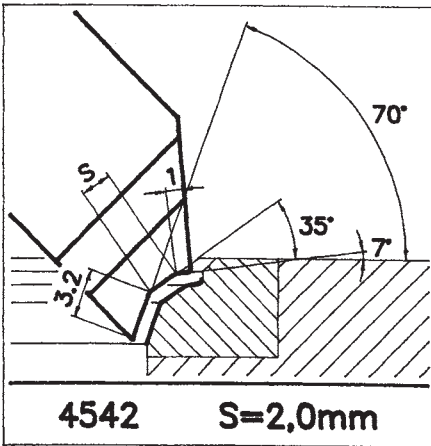
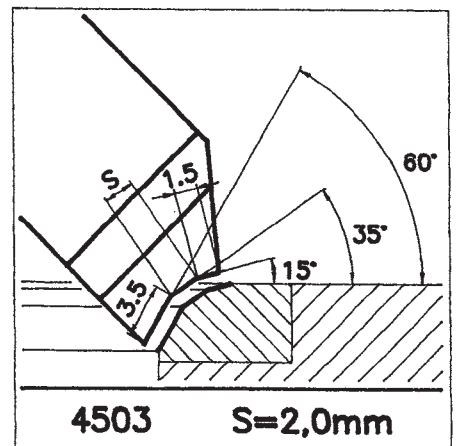
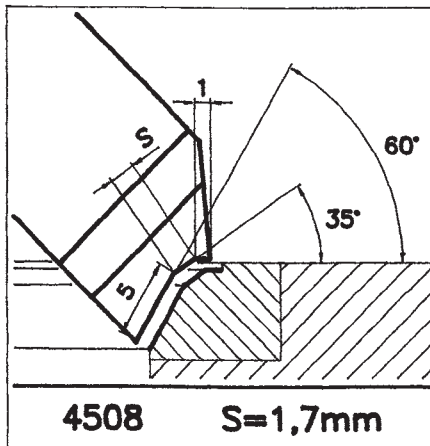
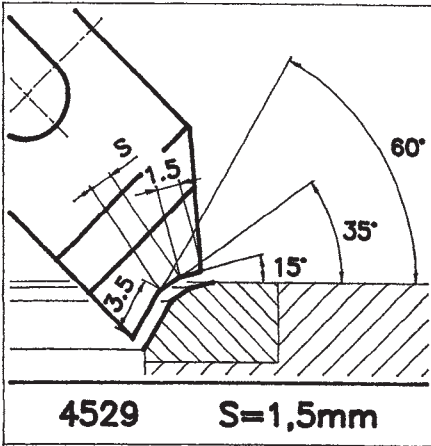


4544 S=3,25mm



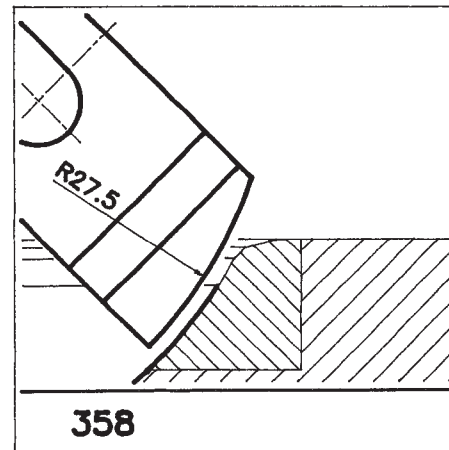
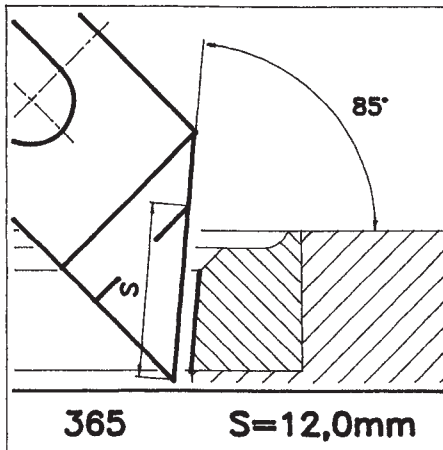
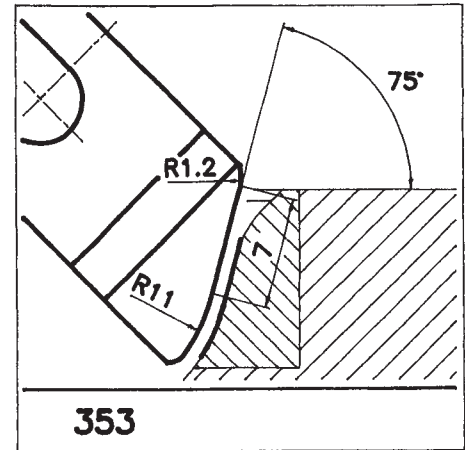
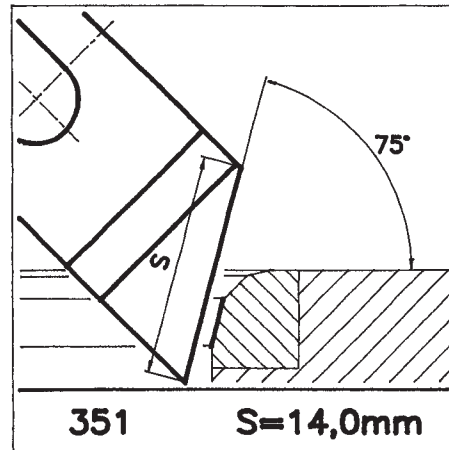
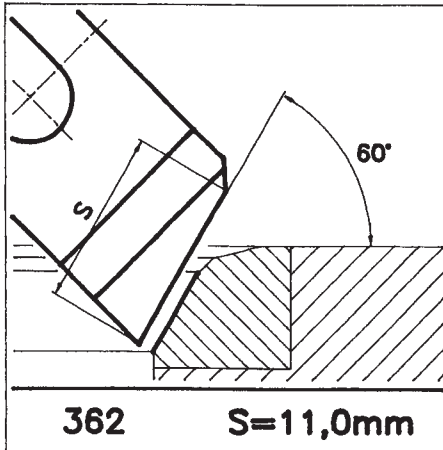
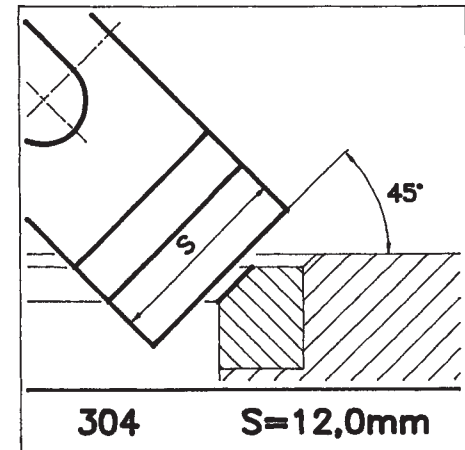
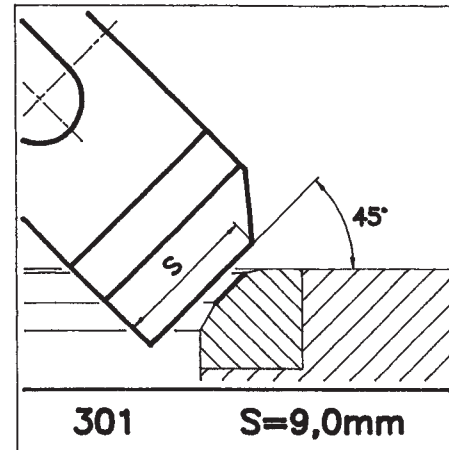
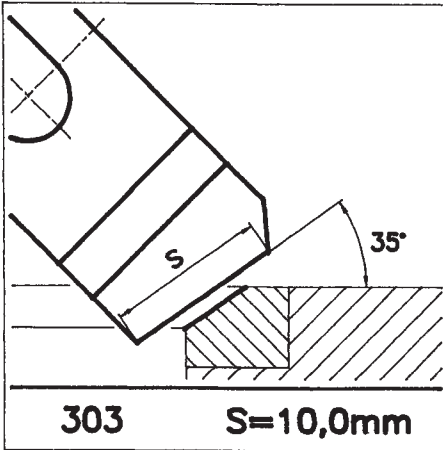
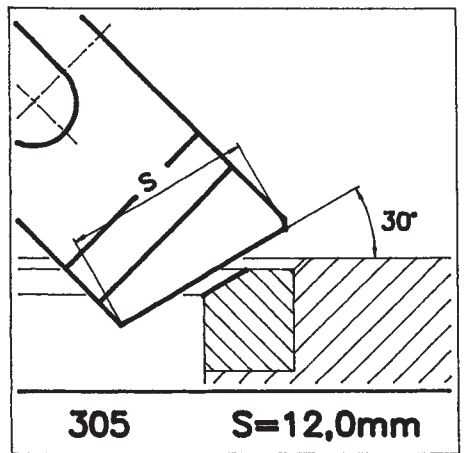
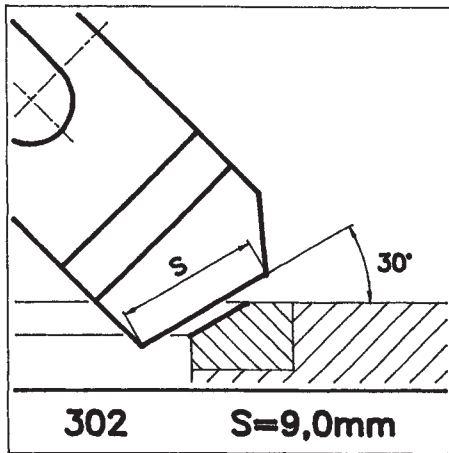
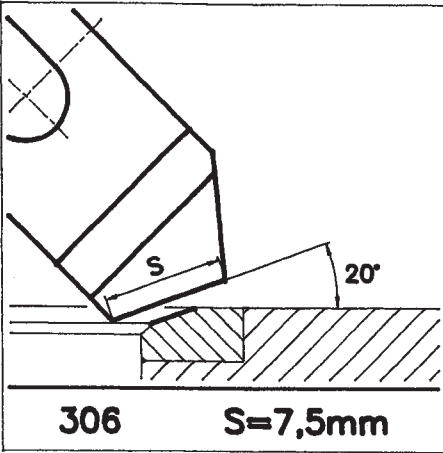
Formtools
Formstähle
Outils de façon
Skärstål
Utensili ad angolazione multipla
Cuchillas de mandrinado moldeada

35°
38°



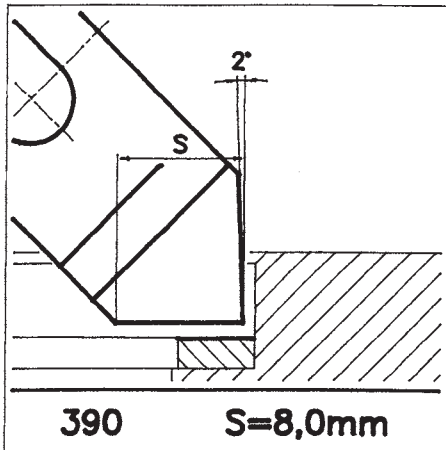
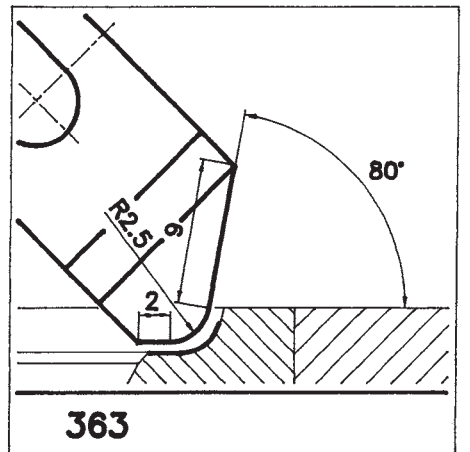
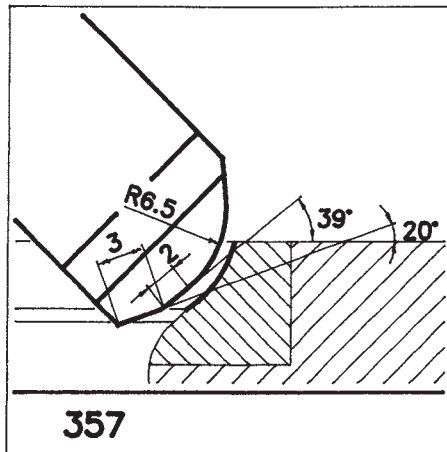
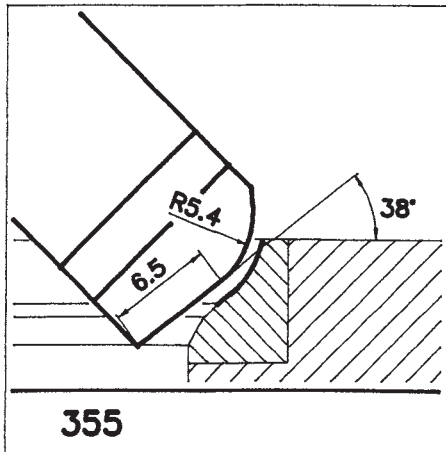
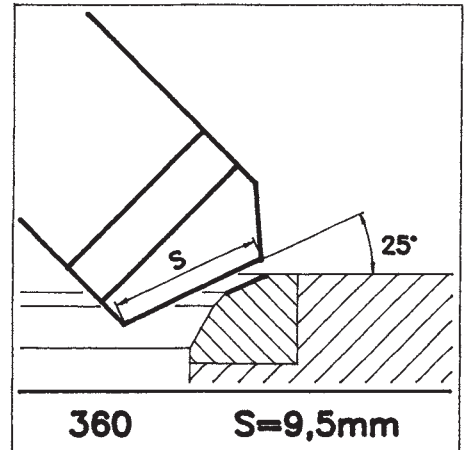
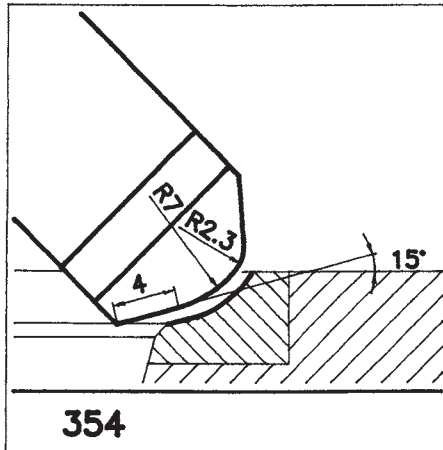
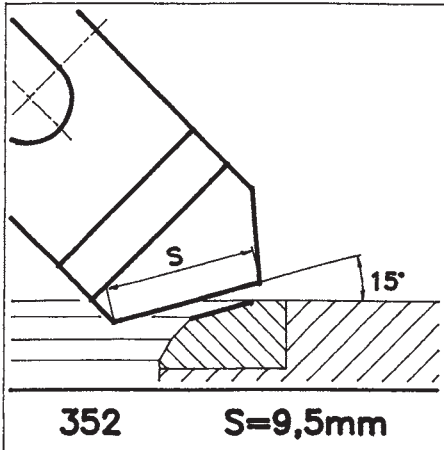


Formtools for corrections
Formstähle für Korrekturen
Outils de façon pour dégagements
Skärstål för reducing
Utensili ad angolazione multipla per correzioni
Buriles para correcciones





Formtools for corrections and counterbores
Formstähle für Korrekturen und Ringsitze
Outils de façon pour dégagements et l'usinage de logements
Skärstål för reducering och ringsäten
Utensili ad angolazione multipla per correzioni e per anelli
Buriles para correcciones y anillos de asiento



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