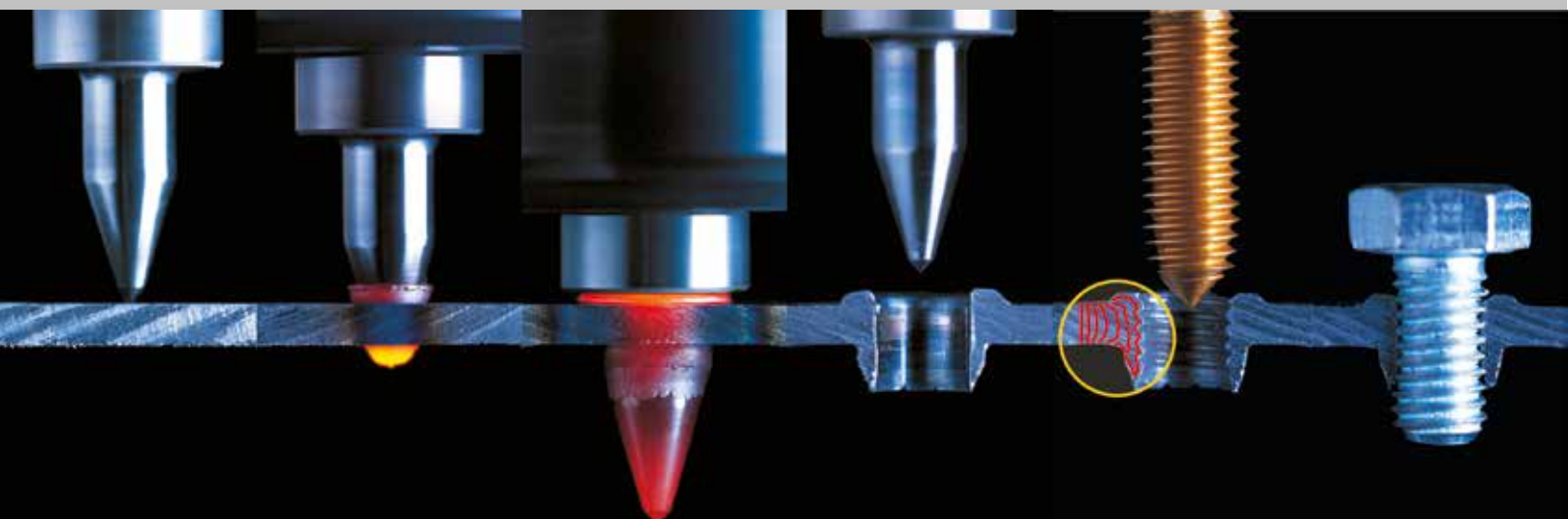


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What do you need to apply the flow forming process?

1. Sufficient power and RPM of the machine, see table =>
2. Collet chuck with cooling ring
3. Collet for clamping the tools
4. Centerdrill flow forming tool for your application
5. Centertap thread former for your application
6. Parting paste for Centerdrill flow forming
7. Oil for Centertap thread forming

Thread	centerdrill core hole -Ø mm	Flow Forming			Thread Forming	
		RMP	Torque Nm	machine output kW	RPM	Torque Nm
Metric ISO thread - DIN 13						
M3	2,7	3000	2,5	0,7	1500	1,3
M4	3,7	2600	3,0	0,8	1100	3,0
M5	4,5	2500	4,0	0,9	900	4,9
M6	5,4	2400	5,0	1,1	800	9,3
M8	7,3	2100	7,0	1,5	600	19,0
M10	9,2	1800	10,0	1,7	380	39,0
M12	10,9	1500	14,0	1,9	300	50,0
M14	13,0	1500	16,0	2,2	300	55,0
M16	14,8	1400	19,0	2,4	200	57,0
M20	18,7	1200	29,0	3,0	160	105,0
Whitworth pipe thread - DIN ISO 228						
G1/8"	9,2	1800	10	1,7	380	13,0
G1/4"	12,4	1600	16	2,1	280	34,0
G3/8"	15,9	1400	24	2,6	200	46,0
G1/2"	19,9	1200	32	3,2	140	94,0
G3/4"	25,4	1000	55	3,8	100	128,0

Centerdrill "Beginner Set"

To achieve best results with centerdrill we recommend the following basic equipment contained in our "Beginner Set":

consisting of:

- 1x collet chuck MC2 / MC3 with cooling ring
- 2 x spanners
- 1x centerdrill collet, optional Ø 6, Ø 8, ..., Ø 20mm
- 1x 250 gr. parting paste for flow punch forming
- 1x 0,25 l lubricant for thread forming

You can get our "Beginner Set" with an MC2 holder in our practical tool case, where is space enough for your centerdrills and centertaps. In addition to the "Beginner Set" we offer you our centerdrills and centertaps as required to your special application.



Beginner Set MC2		
collet size	For centerdrill sizes...	order no.
collet Ø 6	M2, M3, M4, M5	320 0060
collet Ø 8	M6 + M8	320 0080
collet Ø 10	M10 G1/8"	320 0100
collet Ø 12	M12	320 0120
collet Ø 14	M14 + G1/4"	320 0140
collet Ø 16	M16 + G3/8"	320 0160

Beginner Set MC3		
collet size	For centerdrill sizes...	order no.
collet Ø 6	M2, M3, M4, M5	330 0060
collet Ø 8	M6 + M8	330 0080
collet Ø 10	M10 G1/8"	330 0100
collet Ø 12	M12	330 0120
collet Ø 14	M14 + G1/4"	330 0140
collet Ø 16	M16 + G3/8"	330 0160
collet Ø 18	M18, M20 + G1/2"	330 0180
collet Ø 20	G3/4" + G1"	330 0200



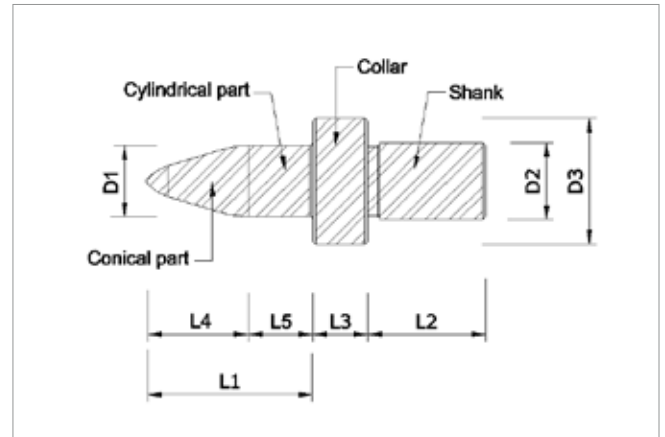
Centerdrill flow punch former

The centerdrill flow punch former consists of a centering point, a tapered, and a cylindrical forming tool section, a collar, and a cylindrical tool shank for clamping. Based on this design principle, several standard flow punch formers are offered, fitting most applications. They differ in length or the form of the collar which forms the extruded metal on the top surface. Standard centerdrill tools are offered in short and long versions. For a given centerdrill diameter they only have a different cylindrical forming tool section length. With these tools, the collar forms the top of the hole into a collar remaining on the surface of the work piece. For flat surfaces, a "flat"-centerdrill tool is offered in short and long versions, where the collar is ground flat on the sides, creating two cutting surfaces. When finishing the cycle, these flat sided collars cut off the material on top of the part, leaving a flat surface.

Maximum wall thickness with standard centerdrills:

Thread	centerdrill core hole-Ø mm	max. wall thickness				working mandrel		Shank-Ø mm
		short mm	long mm	short/flat mm	long/flat mm	L1 short mm	L1 long mm	
Metric ISO thread - DIN 13								
M3 x 0,5	2,7	1,3	2,2	1,7	2,7	6,7	8,0	6,0
M4 x 0,7	3,7	1,3	2,3	1,7	2,7	6,9	9,0	6,0
M5 x 0,8	4,5	1,3	2,4	1,7	2,8	9,0	11,3	6,0
M6 x 1	5,4	1,3	2,7	1,7	3,0	10,5	13,8	8,0
M8 x 1,25	7,3	1,5	3,5	2,0	4,5	14,0	18,2	8,0
M10 x 1,5	9,2	2,0	4,3	2,5	5,2	16,9	22,5	10,0
M12 x 1,75	10,9	2,4	4,9	2,8	5,9	20,0	26,6	12,0
M14 x 2	13,0	2,4	5,3	3,0	7,0	23,5	31,1	14,0
M16 x 2	14,8	3,0	6,4	3,5	7,5	27,0	35,4	16,0
M18 x 2,5	16,7	3,5	7,0	4,0	8,0	30,4	39,8	18,0
M20 x 2,5	18,7	3,7	8,0	4,5	9,0	35,0	44,2	18,0
Whitworth pipe thread - DIN ISO 228								
G1/8" x 28	9,2	2,0	4,3	2,5	5,2	16,9	22,5	10,0
G1/4" x 19	12,4	2,3	5,5	3,0	6,5	22,6	30,0	14,0
G3/8" x 19	15,9	3,3	6,9	3,5	8,0	28,9	37,9	16,0
G1/2" x 14	19,9	4,0	8,5	4,5	9,0	36,3	47,0	18,0
G3/4" x 14	25,4	4,5	10,6	5,0	11,0	46,4	59,6	20,0

Design of the centerdrill:



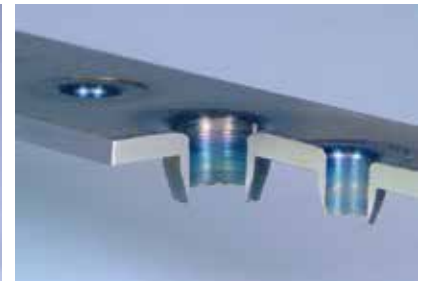
"short" and "long"



Surface with collar



"short-flat" and "long-flat"



Surface without collar

Thread	Shank-Ø	Centerdrill core hole Ø mm		SHORT		LONG		SHORT-FLAT		LONG-FLAT	
		steel	stainless steel*	steel	stainless steel*	steel	stainless steel*	steel	stainless steel*	steel	stainless steel*
Metric ISO thread - DIN 13											
M02 x 0,4	6	1,8	1,8	360 0175	360 0175	350 0175	350 0175	365 0175	365 0175	355 0175	355 0175
M03 x 0,5	6	2,7	2,7	360 0270	360 0270	350 0270	350 0270	365 0270	365 0270	355 0270	355 0270
M04 x 0,7	6	3,7	3,7	360 0370	360 0370	350 0370	350 0370	365 0370	365 0370	355 0370	355 0370
M05 x 0,8	6	4,5	4,5	360 0450	360 0450	350 0450	350 0450	365 0450	365 0450	355 0450	355 0450
M06 x 1	8	5,4	5,4	360 0540	360 0540	350 0540	350 0540	365 0540	365 0540	355 0540	355 0540
M08 x 1,25	8	7,3	7,4	360 0730	360 0740	350 0730	350 0740	365 0730	365 0740	355 0730	355 0740
M10 x 1,5	10	9,2	9,3	360 0920	360 0930	350 0920	350 0930	365 0920	365 0930	355 0920	355 0930
M12 x 1,75	12	10,9	11,0	360 1090	360 1100	350 1090	350 1100	365 1090	365 1100	355 1090	355 1100
M14 x 2	14	13,0	13,0	360 1300	360 1300	350 1300	350 1300	365 1300	365 1300	355 1300	355 1300
M16 x 2	16	14,8	14,8	360 1480	360 1480	350 1480	350 1480	365 1480	365 1480	355 1480	355 1480
M18 x 2,5	18	16,7	16,7	360 1670	360 1670	350 1670	350 1670	365 1670	365 1670	355 1670	355 1670
M20 x 2,5	18	18,7	18,7	360 1870	360 1870	350 1870	350 1870	365 1870	365 1870	355 1870	355 1870

*Centerdrill core hole Ø for stainless steel + 0,1mm for M8 - M12

(continued on the next page)



Centerdrill flow punch former

Thread	Shank- ø	Centerdrill core hole ø mm		SHORT		LONG		SHORT-FLAT		LONG-FLAT	
		steel	stainless steel*	steel	stainless steel*	steel	stainless steel*	steel	stainless steel*	steel	stainless steel*
Whitworth pipe thread - DIN ISO 228											
				order no.		order no.		order no.		order no.	
G 1/8"	10	9,2	9,3	360 0920	360 0930	350 0920	350 0930	365 0920	365 0930	355 0920	355 0930
G 1/4"	14	12,4	12,4	360 1240	360 1240	350 1240	350 1240	365 1240	365 1240	355 1240	355 1240
G 3/8"	16	15,9	15,9	360 1590	360 1590	350 1590	350 1590	365 1590	365 1590	355 1590	355 1590
G 1/2"	18	19,9	19,9	360 1990	360 1990	350 1990	350 1990	365 1990	365 1990	355 1990	355 1990
G 3/4"	20	25,4	25,4	360 2540	360 2540	350 2540	350 2540	365 2540	365 2540	355 2540	355 2540
G 1"	20	32,0	32,0	360 3200	360 3200			365 3200	365 3200		

*Centerdrill core hole ø for stainless steel + 0,1mm for G1/8"

Centerdrill flow punch forming tools in special design

If our standard products cannot be used or are not adequate for your specific application, we also manufacture custom flow punch formers according to drawings. We will be happy to consult with you regarding your special requirements. The following are examples of such special designs.

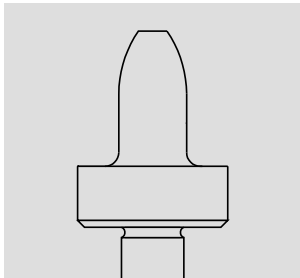


Fig. 1:
Cut-off tip

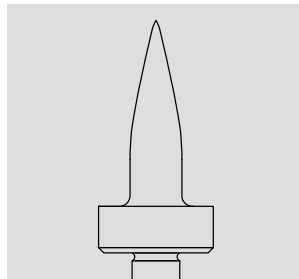


Fig. 2:
Extended cylindrical
working part

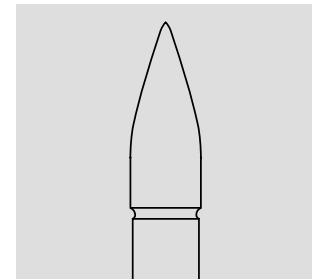


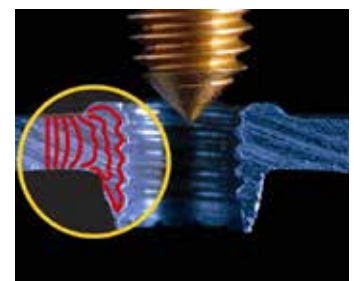
Fig. 3:
no belt

Centertap thread former

Thread forming with centertap offers the exact same advantages as flow punch forming. It is a chip-less process in which the material is rendered flowable and displaced from the thread root into the crests. It is similar in principle to the rolling of external threads. Centertap is available for all common thread sizes, TIN- and for aluminium TICN-coated and all sizes greater than M8 with lubrication flutes.

Metric ISO thread per- DIN 13	order no.	Whitworth pipe thread per DIN ISO 228	order no.
M 2 x 0,4	390 M02TIN	G 1/8"	390 G1/8 MS
M 3 x 0,5	390 M03TIN	G 1/4"	390 G1/4 MS
M 4 x 0,7	390 M04TIN	G 3/8"	390 G3/8 MS
M 5 x 0,8	390 M05TIN	G 1/2"	390 G1/2 MS
M 6 x 1	390 M06TIN	G 3/4"	390 G3/4 MS
M 8 x 1,25	390 M08MS	G 1"	390 G1 MS
M 10 x 1,5	390 M10MS		
M 12 x 1,75	390 M12MS		
M 14 x 2	390 M14MS		
M 16 x 2	390 M16MS		
M 18 x 2,5	390 M18MS		
M 20 x 2,5	390 M20MS		

Other thread sizes (MF, UNC, NPT, etc.) at request.





Centerdrill parting paste for flow forming

Water soluble, for spraying, not unseating and oil-free

The wetting of the centerdrill with our highly heat-resistant white release agent is of great importance of its service life. Applying the release agent, either in paste or liquid form, gives a white film on the flow punch former, which greatly reduces the baking of metal on the centerdrill former. Our release agent is **water soluble**. It can therefore easily be removed from the metal, and does not interfere with further processing, such as with paint jobs, etc. The separation agent in liquid form is a long time in limbo and does not need to be stirred.

composition	package size	order no.
pasty	1 Kg	370 ST4810
	250 gr.	370 ST4802
liquid	1 liter	370 ST4010
	5 liter	370 ST4050



Centertap oil for thread forming

High performance oils for spraying and easily washable

When tapping, the application of our lubricant is essential. It should be applied before each work gear, either manually, with a brush or with a spraying machine on the centertap thread former. Our cutting oils do not contain volatile chlorinated hydrocarbons. And the base oils are combined according to the latest findings and to environmental friendly criteria. In applications where residual oils can be annoying, such as during painting jobs, etc., our cutting oil 370 ST 6510 and 6550 can be set. This oil is mineral oil free, readily dilutable with water and therefore washable.

composition	package size	order no.
standard "chlorine-free"	250 ml	370 ST6725
	1 Kg	370 ST6710
	5 Kg	370 ST6750
washable "mineral oil-free"	1 liter	370 ST6510
	5 liter	370 ST6550





Centerdrill collet chucks

Due to the extreme thermal fluctuation and the radial load, proper clamping of the work piece and the flow punch former is critical. To protect the spindle from the heat generated during the centerdrill process, the tool holder should be designed with a heat sink. Due to the high tool torque developed during the forming process when using drill chucks, a danger is that the jaws or parts or the chuck break. Therefore the use of drill chucks should be avoided and instead our centerdrill tool collet chuck is recommended. Besides a more secure tool clamping our specifically developed collet tool holder improves the tool concentricity and integrates a heat sink cooling fan. The tool taper size MC2 (MT2) is standard for flow punch formers up to a tool shank diameter of 14mm. For larger flow punch former we recommend a MC3 taper size holder. If your machine has a different tool taper, we also supply specific holders fitting your needs, like tool holder for SK, BT and HSK tool taper systems. As standard all our tool holders are delivered with a set of hook wrenches. Please feel free to contact us with any of your questions. Most likely we already have supplied a chuck fitting your particular needs.

Size	using for collet Ø	order no.
MC 2	6 - 16	385 SZFMK02
MC 3	6 - 20	385 SZFMK03
SK 30	6 - 16	385 SZFSK30
SK 40	6 - 16	385 SZFSK40
BT 30	6 - 16	385 SZFBT30
BT 40	6 - 16	385 SZFBT40
HSK 63	6 - 16	385 SZFHSK63



Centerdrill collets

For optimal concentricity and secure clamping, a collet is used for clamping the centerdrill. You have the choice between two sizes ER25 and ER32 for different collet chucks.

		Collet chucks	
Thread sizes metric	Shank - Ø	MC2/SK40/ SK30/BT30	MC 3
order no.			
M2, M3, M4, M5	6	380 430E06	380 470E06
M 6 + M 8	8	380 430E08	380 470E08
M 10	10	380 430E10	380 470E10
M 12	12	380 430E12	380 470E12
M 14	14	380 430E14	380 470E14
M 16	16	380 430E16	380 470E16
M 18 + M 20	18		380 470E18

		Collet chucks	
Thread sizes Whitworth	Shank - Ø	MC2/SK40/ SK30/BT30	MC 3
order no.			
G 1/8"	10	380 430E10	380 470E10
G 1/4"	14	380 430E14	380 470E14
G 3/8"	16	380 430E16	380 470E16
G 1/2"	18		380 470E18
G 3/4"	20		380 470E20
G 1"	20		380 470E20

