

BT-MAS

PRODUCT CATALOGUE 2015



Quick facts about SPV Spintec's hydraulic chucks!

- High clamping torque, 320 Nm at a $\varnothing 20$ mm shank in a standard hydraulic chuck.
- Runout accuracy better than 0,003 mm. (see below).
- Quick assembly method of the tool. No special equipment needed.
- Balanced for 10 000 RPM (G 6.3) as standard - can be supplied fine balanced up to 30 000 RPM (G 2.5).
- The widest range of hydraulic chucks on the market. Available for all applications.
- If our standard assortment isn't enough we will design a chuck according to your needs!

Why should you use SPV Spintec's hydraulic chucks?

- Up to 50 % longer lifetime of the tool compared to conventional tool holder systems.
- Increased surface finish, thanks to the solid fastening of the tool.
- Permits machining with much closer tolerances.
- Quicker and simpler tool changes.

Runout accuracy

All of our hydraulic chuck models are made with runout accuracy better than 0,003 mm.

This means that you can machine to closer tolerances and tool lifetime is extended - giving you better overall economy.



Our different types of hydraulic chucks



- Type HCF / HCF+
Short standard chuck



- Type HCFL / HCFL+
Extended standard chuck



- Type HCP+
Pen-chuck in two different lengths



- Type HCPK+
Long tapered chuck

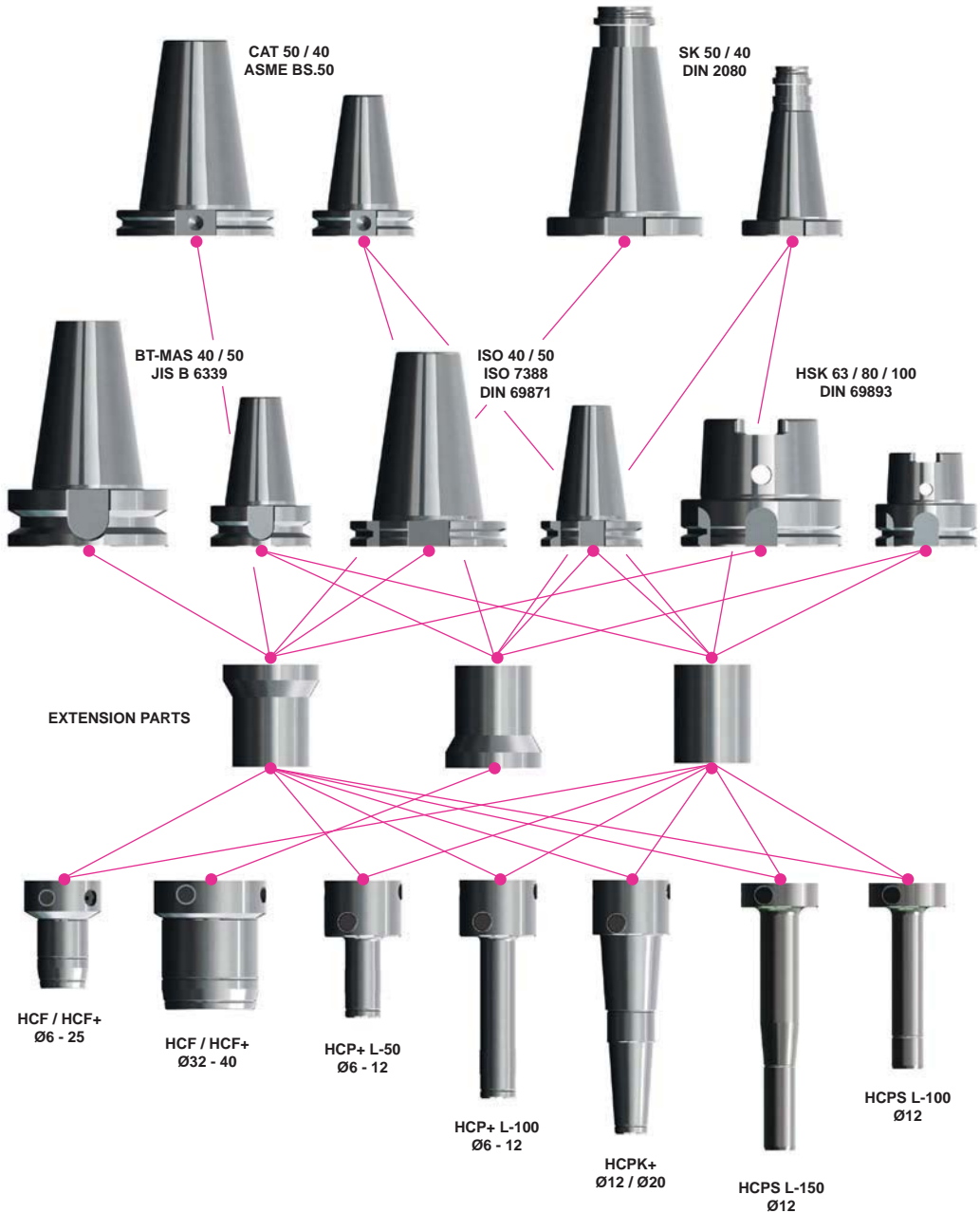


- Type HCK+
Extra short chuck



- Type HCPS
Extra long and slim pen-chuck

Optional combinations for our hydraulic chucks



The Plus-membrane [+]

Facts about SPV Spintec's developed milling-membrane - The Plus-membrane [+]

SPV Spintec's hexagonal milling membrane (+membrane)

permits though, vibration-free milling. A highly stable tool anchorage makes it possible to machine at greater feed rates and with greater axial and radial depths of cut than normally recommended.

Limitations of conventional hydraulic chucks

The limitation in the use of hydraulic chucks has frequently been the use of recommended cutting data for heavy duty milling.

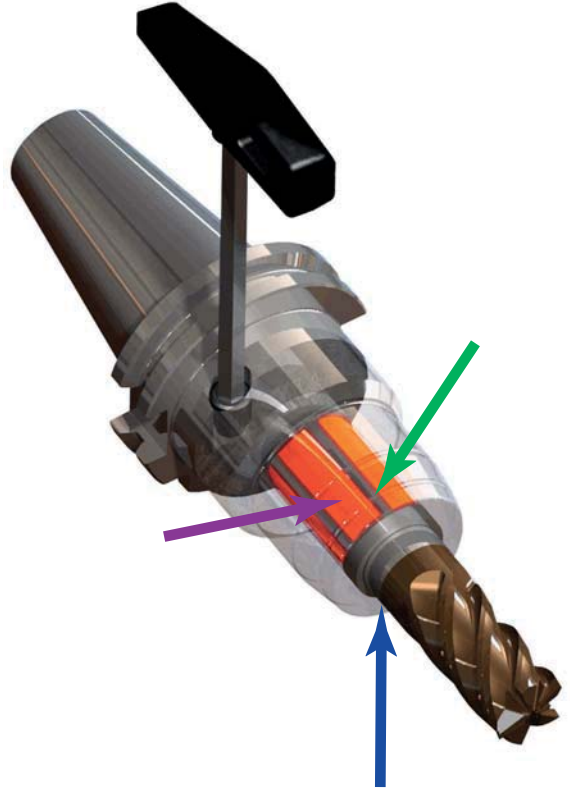
Customers have often been obliged to purchase specially shortened hydraulic milling chucks with increased torque when they have needed to remove a large amount of material in the shortest possible time.

We have eliminated this limitation and offer our customers the opportunity of using our developed hydraulic milling chuck for both drilling and milling, which offers better overall economy.

History of development

The development started when British Aerospace in England had problems with milling vibration, which lead to very short lifetime for their expensive solid metal cutting tools.

BA tried several commercially available retention systems but did not find a satisfactory solution. At that time SPV developed the hexagonal milling membrane which was found in tests at British Aerospace to multiply the period of contact several times over and in some cases, enabled them to double both radial and axial cutting depths.

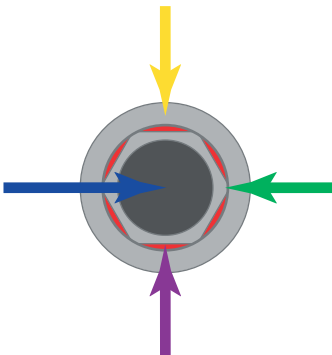


Yellow arrow
Outer housing, hydraulic chuck

Blue arrow
Tool (drill, cutter, etc.)

Purple arrow
Hydraulic chamber which combines with high hydraulic pressure in the chuck to provide stable anchorage, with long, linear, thinwall gripping surfaces which protect the tool from flexing.

Green arrow
The remaining material between the hydraulic chambers creates - reinforcement ribs - which minimise vibration and stiffen the membrane.



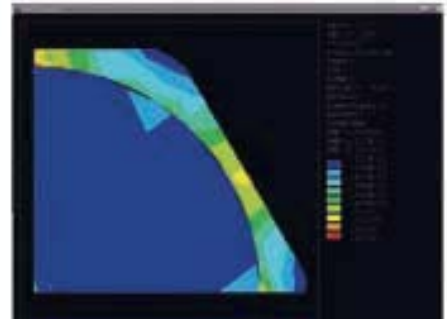
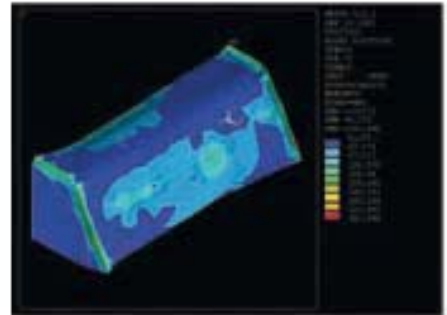
Analysis

A calculation and simulation of loading cases using the Finite Element Method (FEM) and 3D-models was done in collaboration with Mälardalen University College in Eskilstuna, Sweden to verify the results offered by the new design, and to make a comparison with the traditional cylindrical membrane design in hydraulic chucks.

Testing

A trial was done in the spring of 2003 at SECO in Fagersta, Sweden in an attempt to verify any limits there might be on cutting data. An extract from the test report (P-1006, 2003-04-29 at SECO, Fagersta) shows the following.

- Test sample:
Hydraulic chucks, HCF+ with hexagonal membrane.
- Machining tools:
Solid 3-blade hard metal cutters, made by Jabro, with Tribon coating in dimensions $\varnothing 10$, $\varnothing 12$ and $\varnothing 20$ mm.
- Work piece material:
Square bar, 75x75 mm made from heat treatable steel SS 2244-05, hardness 270 - 315 HB.



Test summary

The results show that the hydraulic chucks equipped with a hexagonal membrane (+membrane) can manage up to twice the recommended axial and radial cutting depth without tool chipping or vibration which affects surface finish. In practice, this means that the possible swarf yield has been multiplied by four.

- HCF+ chucks:
- Hydraulic chucks, HCF+, with tools $\varnothing 10$, $\varnothing 12$ and $\varnothing 20$ can manage the the cutting data in Jabro's recommendation for coarse slab milling.
 - 2 x recommended axial cutting depth is quite OK, without any vibration arising that could damage the tool.
 - 2 x recommended radial cutting depth is quite OK.

Specifications

Coarse slab milling with rotational speed and feed rate to Jabro's recommendations:

Recommended depth of cut:
axial = 1x tool diameter
radial = 0,4 x tool diameter

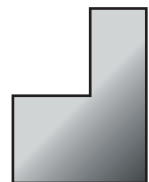
This gives a chip area of:
 $1 \times D \text{ mm} \times 0,4 \times D \text{ mm} = 0,4 \times D \text{ mm}^2$



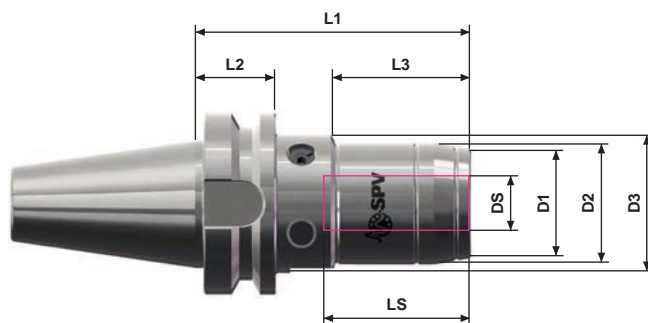
Coarse slab milling with rotational speed and feed rate to Jabro's recommendations:

HCF+ test with twice the recommended depth of cut, axially and radially.

This gives a chip area of:
 $2 \times D \text{ mm} \times 0,8 \times D \text{ mm} = 1,6 \times D \text{ mm}^2$



STANDARD CHUCK HCF / HCF+



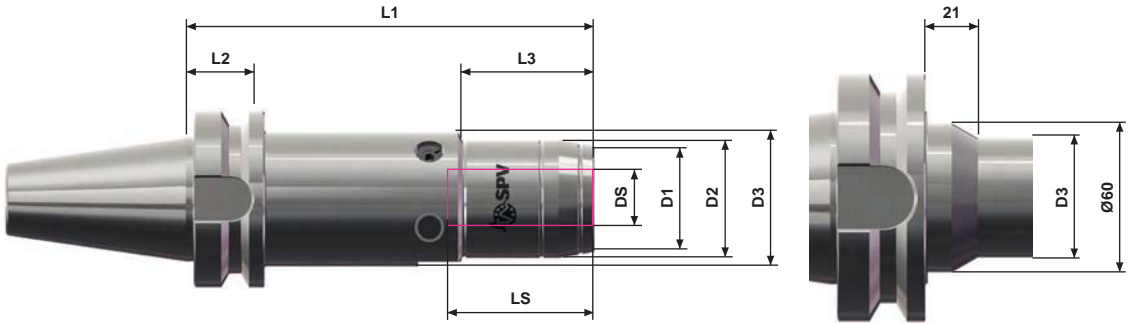
For milling-membrane (+) specify + after art.no.

DS Ømm	Mount type	D1 Ømm	D2 Ømm	D3 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Article- number
6	BT-40	21,5	26	48	95	27	43,5	37,5	56640
	BT-50	21,5	26	48	106	38	43,5	37,5	56650
8	BT-40	23,5	28	48	95	27	43,5	37,5	56641
	BT-50	23,5	28	48	106	38	43,5	37,5	56651
10	BT-40	25,5	30	48	95	27	43,5	42,5	56642
	BT-50	25,5	30	48	106	38	43,5	42,5	56652
12 *	BT-40	27,5	32	48	95	27	44,5	47,5	56643
	BT-50	27,5	32	48	106	38	44,5	47,5	56653
14	BT-40	29,5	34	48	95	27	44,5	47,5	56644
	BT-50	29,5	34	48	106	38	44,5	47,5	56654
16	BT-40	33,5	38	48	95	27	47,5	52,5	56645
	BT-50	33,5	38	48	106	38	47,5	52,5	56655
18	BT-40	35,5	40	48	95	27	47,5	52,5	56646
	BT-50	35,5	40	48	106	38	47,5	52,5	56656
20 *	BT-40	37,5	42	48	95	27	47,5	52,5	56647
	BT-50	37,5	42	48	106	38	47,5	52,5	56657
25	BT-40	43,5	48	48	99	27	72	55	56648
	BT-50	43,5	48	48	110	38	72	55	56658
32 *	BT-40	55,5	60	70	108	27	57	65	56649
	BT-50	55,5	60	70	119	38	57	65	56659
40 **	BT-50	65	70	70	124	38	85	70	56114+

* Dimensions that can be used with reduction sleeves. (Reduction sleeves, see p.40.)

** Ø40 is only available with ISO-50 and milling-membrane (+).

EXTENDED STANDARD CHUCK HCFL / HCFL+



BT-50 appearance Ø6 - Ø25

For milling-membrane (+) specify + after art.no.

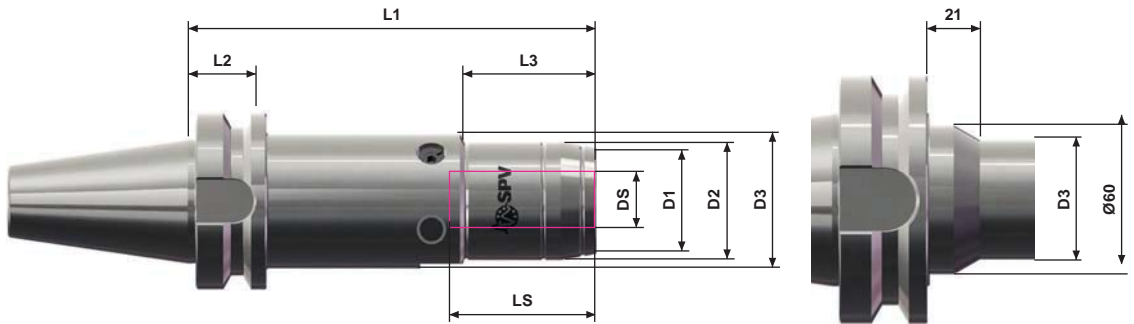
DS Ømm	Mount type	D1 Ømm	D2 Ømm	D3 Ømm	L1 mm	L2 mm	L3 mm	LS mm	Article- number
6	BT-40	21,5	26	48	135	27	43,5	37,5	56720
	BT-40	21,5	26	48	135-485	27	43,5	37,5	▲
	BT-50	21,5	26	48	160	38	43,5	37,5	56730
	BT-50	21,5	26	48	160-445	38	43,5	37,5	▲
8	BT-40	23,5	28	48	135	27	43,5	37,5	56721
	BT-40	23,5	28	48	135-485	27	43,5	37,5	▲
	BT-50	23,5	28	48	160	38	43,5	37,5	56731
	BT-50	23,5	28	48	160-445	38	43,5	37,5	▲
10	BT-40	25,5	30	48	135	27	43,5	42,5	56722
	BT-40	25,5	30	48	135-485	27	43,5	42,5	▲
	BT-50	25,5	30	48	160	38	43,5	42,5	56732
	BT-50	25,5	30	48	160-445	38	43,5	42,5	▲
12 *	BT-40	27,5	32	48	135	27	44,5	47,5	56723
	BT-40	27,5	32	48	135-485	27	44,5	47,5	▲
	BT-50	27,5	32	48	160	38	44,5	47,5	56733
	BT-50	27,5	32	48	160-445	38	44,5	47,5	▲
	BT-40	29,5	34	48	135	27	44,5	47,5	56724
	BT-40	29,5	34	48	135-485	27	44,5	47,5	▲
14	BT-50	29,5	34	48	160	38	44,5	47,5	56734
	BT-50	29,5	34	48	160-445	38	44,5	47,5	▲
	BT-40	33,5	38	48	135	27	47,5	52,5	56725
	BT-40	33,5	38	48	135-485	27	47,5	52,5	▲
16	BT-50	33,5	38	48	160	38	47,5	52,5	56735
	BT-50	33,5	38	48	160-445	38	47,5	52,5	▲

* Dimensions that can be used with reduction sleeves.
(Reduction sleeves, see p.40.)

▲ Depending on desired length (L1). Specify art.no / L1 on order.

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EXTENDED STANDARD CHUCK HCFL / HCFL+



BT-50 appearance Ø6 - Ø25

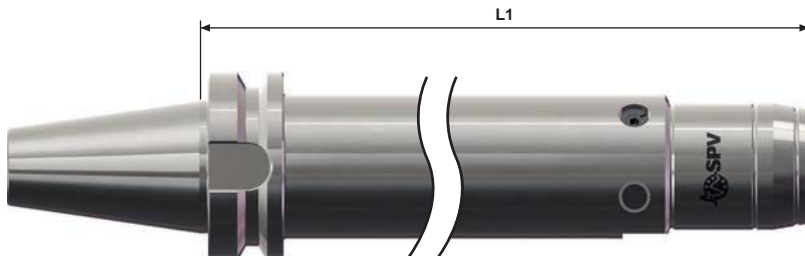
For milling-membrane (+) specify + after art.no.

DS Ømm	Mount type	D1 Ømm	D2 Ømm	D3 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Article- number
18	BT-40	35,5	40	48	135	27	47,5	52,5	56726
	BT-40	35,5	40	48	135-485	27	47,5	52,5	▲
	BT-50	35,5	40	48	160	38	47,5	52,5	56736
	BT-50	35,5	40	48	160-445	38	47,5	52,5	▲
20 *	BT-40	37,5	42	48	135	27	47,5	52,5	56727
	BT-40	37,5	42	48	135-485	27	47,5	52,5	▲
	BT-50	37,5	42	48	160	38	47,5	52,5	56737
	BT-50	37,5	42	48	160-445	38	47,5	52,5	▲
	BT-40	43,5	48	48	139	27	111	55	56728
	BT-40	43,5	48	48	139-485	27	---	55	▲
25	BT-50	43,5	48	48	164	38	105	55	56738
	BT-50	43,5	48	48	164-445	38	---	55	▲
	BT-40	55,5	60	70	148	27	57	65	56729
	BT-40	55,5	60	70	148-485	27	57	65	▲
32 *	BT-50	55,5	60	70	159	38	57	65	56739
	BT-50	55,5	60	70	159-445	38	57	65	▲

* Dimensions that can be used with reduction sleeves.
(Reduction sleeves, see p.40.)

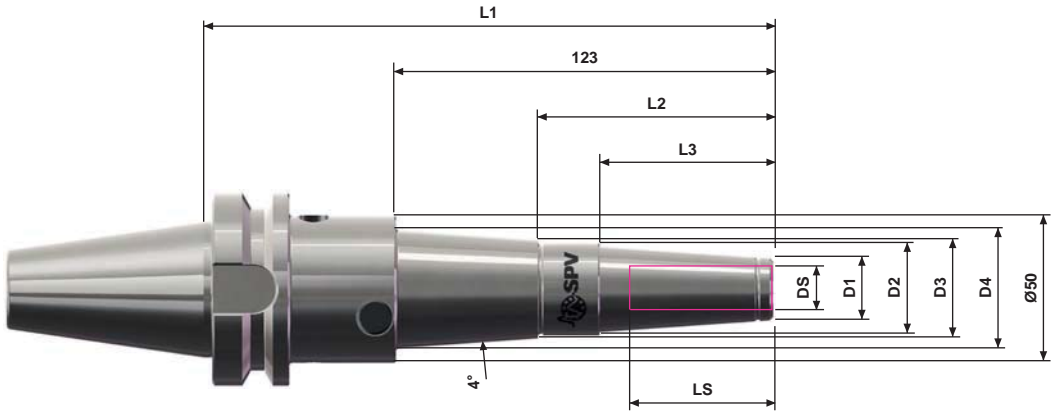
▲ Depending on desired length (L1). Specify art.no / L1 on order.

HCFL / HCFL+ IN ANY LENGTH



Ordering example: BT-40, Ø20, L1 = 295 mm, type HCFL+ Article number: 56727+/295

TAPERED, LONG CHUCK WITH MILLING-MEMBRANE HCPK+

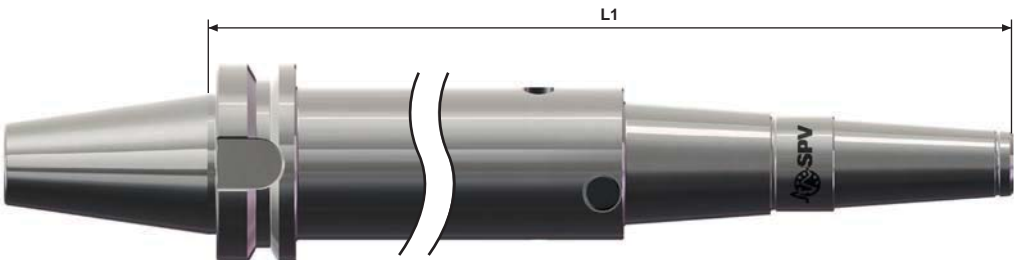


DS Ømm	Mount type	D1 Ømm	D2 Ømm	D3 Ømm	D4 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Article- number
12 *	BT-40	20	30	32	40,5	185	76,8	57	44	59153+
	BT-40	20	30	32	40,5	225-485	76,8	57	44	▲
	BT-50	20	30	32	40,5	196	76,8	57	44	59173+
	BT-50	20	30	32	40,5	236-445	76,8	57	44	▲
20 *	BT-40	32	39	42	50,5	185	74,8	55	52	59157+
	BT-40	32	39	42	50,5	225-485	74,8	55	52	▲
	BT-50	32	39	42	50,5	196	74,8	55	52	59177+
	BT-50	32	39	42	50,5	236-445	74,8	55	52	▲

* Dimensions that can be used with reduction sleeves.
(Reduction sleeves, see p.40.)

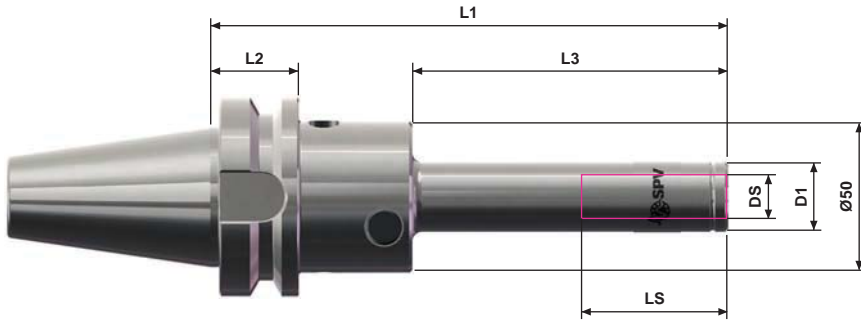
▲ Depending on desired length (L1). Specify art.no / L1 on order.

HCPK+ IN ANY LENGTH



Ordering example: BT-40, Ø20, L1 = 285 mm, type HCPK+ Article number: 59147+/285

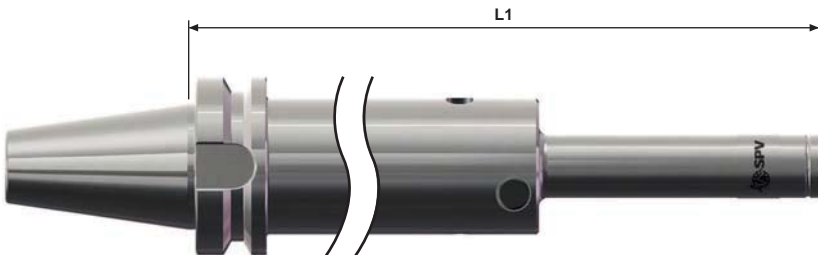
PEN-CHUCK WITH MILLING-MEMBRANE HCP+



DS Ømm	Mount type	D1 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Article- number
6	BT-40	22,5	113	27	50	37,5	59100+
	BT-40	22,5	163	27	100	37,5	59110+
	BT-50	22,5	124	38	50	37,5	59150+
	BT-50	22,5	174	38	100	37,5	59160+
8	BT-40	22,5	113	27	50	37,5	59101+
	BT-40	22,5	163	27	100	37,5	59111+
	BT-50	22,5	124	38	50	37,5	59151+
	BT-50	22,5	174	38	100	37,5	59161+
10	BT-40	22,5	113	27	50	42,5	59102+
	BT-40	22,5	163	27	100	42,5	59112+
	BT-50	22,5	124	38	50	42,5	59152+
	BT-50	22,5	174	38	100	42,5	59162+
12 *	BT-40	22,5	113	27	50	44	59103+
	BT-40	22,5	163	27	100	44	59113+
	BT-50	22,5	124	38	50	44	59153+
	BT-50	22,5	174	38	100	44	59163+

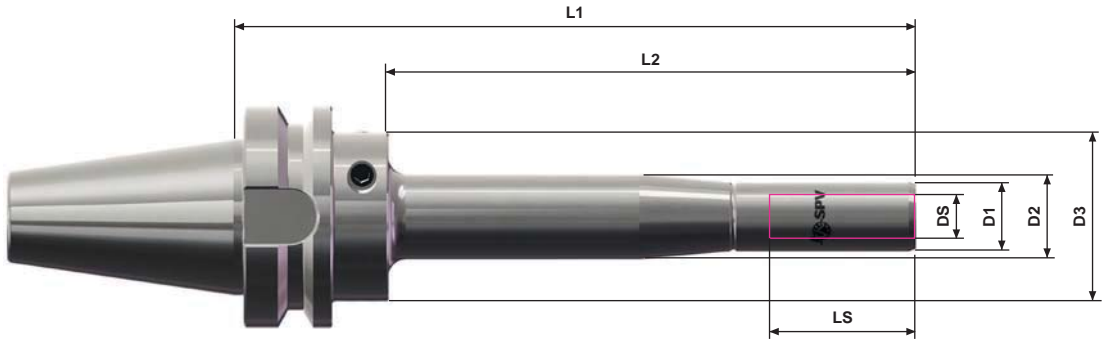
* Dimensions that can be used with reduction sleeves.
(Reduction sleeves, see p.40.)

HCP+ IN ANY LENGTH



Ordering example: BT-40, Ø12, L1 = 263 mm, L3 = 100, type HCP+ Article number: 59113+/263

EXTRA LONG, SLIM PEN-CHUCK HCPS

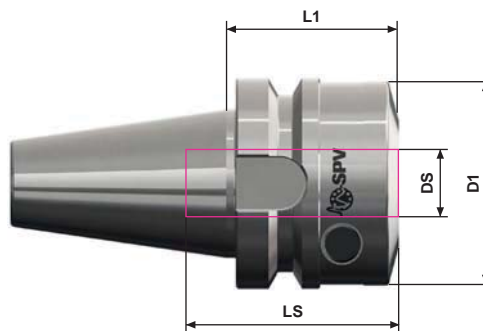


DS Ømm	Mount type	D1 Ømm	D2 Ømm	D3 Ømm	L1 Ømm	L2 Ømm	L3 Ømm	LS Ømm	Article- number
12 *	BT-40	19,5	----	48	143	100	----	42	59603
	BT-50	19,5	----	48	154	100	----	42	59613
12 *	BT-40	19,5	24	48	193	150	52	42	59703
	BT-50	19,5	24	48	204	150	52	42	59713

* Dimensions that can be used with reduction sleeves.
(Reduction sleeves, see p.40.)

Also available as extended chuck. Contact us for more info.

EXTRA SHORT MILLING-CHUCK MED MILLING-MEMBRANE HCK+

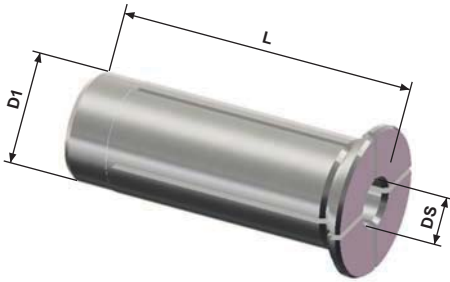


HCK+ has an extended membrane which provides 600 Nm compared to 320 Nm on a standard chuck. Check the LS dimension!

DS Ømm	Mount type	D1 Ømm	L1 Ømm	LS Ømm	Article- number
20	BT-40	61	56	70	66125+

Reduction sleeves HC

Cylindrical reduction sleeves for hydraulic chucks



Sealed sleeve with rubber stop.

Sleeves can be converted to unsealed by removing the rubber stop.

Other dimensions on request.

REDUCTION SLEEVES D = mm

D Ømm	DS Ømm	L mm	Article- number
12	3	44	90003
	4	44	90004
	5	44	90005
	6	44	90006
	8	44	90008
	10	44	90010
20	3	50	90103
	4	50	90104
	5	50	90105
	6	50	90106
	8	50	90108
	10	50	90110
	12	50	90112
	14	50	90114
	16	50	90116
32	6	63	90206
	8	63	90208
	10	63	90210
	12	63	90212
	14	63	90214
	16	63	90216
	18	63	90218
	20	63	90220
	25	63	90225

REDUCTION SLEEVES D = inch

D Ømm	DS Ømm	L mm	Article- number
3/4"	1/8"		67960
	5/32"		67961
	3/16"		67962
	1/4"		67963
	5/16"		67964
	3/8"		67965
	7/16"		67966
	1/2"		67967
	9/16"		67968
	5/8"		67969
1 1/4"	3/8"		67980
	1/2"		67981
	5/8"		67982
	3/4"		67983
	1"		67984

We also provide sleeves with custom clamping diameter (DS) on request.

Operating instructions

1. Working temperature

Ideal and optimised working temperature is between 20° och 50 ° C. Do not store hydraulic chucks where the temperature could exceed 50 ° C.

2. Cleaning

It is very important that both the tool shank and the inside of the chuck are free from grease and other contamination. Use an alcohol based degreaser.

3. Tightening the membrane

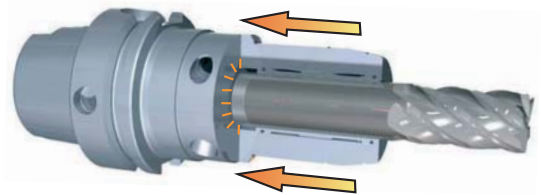
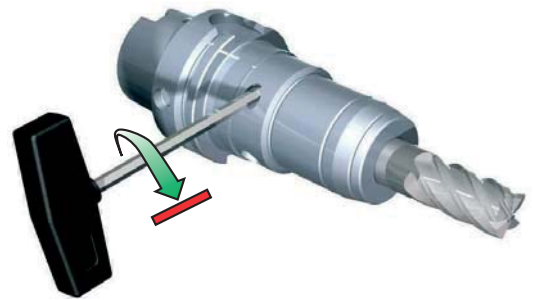
The screw must always be tightened to the fixed stop. Never tighten the screw without a tool in the chuck, since there is a risk that the hydraulic chamber could be deformed.

4. Tool insertion length

The tool must be inserted to a fixed stop, to prevent the hydraulic chamber from being deformed by the pressure. When reduction sleeves are used, at least 60% of the length of the tool shank must be used.

5. Service and repair

If you experience that your hydraulic chuck doesn't clamp properly, this can be due to several things. A common explanation is that the hydraulic piston seal is worn out. We always perform service on our hydraulic chucks. Contact us for more information.



Important information about tool-shanks.

■ Standard chucks - **type HCF / HCFL / HCPS**

*In standard chucks from Ø6 up to Ø20, Weldon-shanks can be used directly in the chucks.
Shank tolerance h6.*

■ Chucks with milling-membrane [+] - **type HCF+ / HCFL+ / HCP+ / HCPK+ / HCK+**

*In chucks with milling membrane (+) only cylindrical shanks can be used directly in the chuck.
Shank tolerance h6.*

■ Other types of tool-shanks - **all except HCK+**

*Other types of tool shank such as Weldon, Whistlenotch can be used in combination with a
reduction sleeve in the chuck.*

Torque-table

Tool diameter ØDS mm	HCF / HCF+	HCK+	HCP+	HCPK+	HCPS
6	15 Nm		15 Nm		
8	20 Nm		20 Nm		
10	40 Nm		40 Nm		
12	80 Nm		80 Nm	80 Nm	80 Nm
14	110 Nm				
16	130 Nm				
18	190 Nm				
20	320 Nm	600 Nm		320 Nm	
25	400 Nm				
32	650 Nm	1 200 Nm			
40	1 200 Nm				



WARNING!

*Disassembling and assembling a hydraulic chuck requires special tools and equipment.
Always send the chuck to SPV Spintec representative if it needs to be repaired.*

SPV Spintec also manufactures hydraulic chucks in fully customized versions for e.g. odd machines that are not equipped with a standard spindle. We meet the customers demands by designing and developing special chucks which fit the customers application. We manufacture special chucks for both internal and external clamping. The chucks can be designed for holding a tool or as a fixture for accurate clamping of a workpiece.

