

Hydrochucks HSK



HYDROCHUCKS

Information

Quick facts about SPV Spintec's hydrochucks

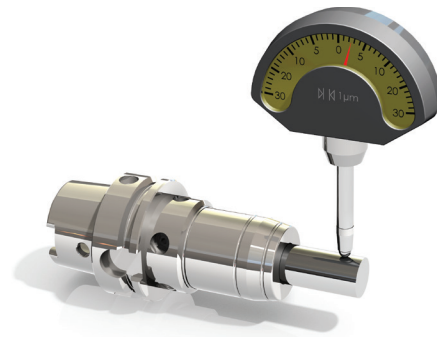
- High clamping force, 320 Nm at a Ø20 mm shank in a standard hydrochuck.
- Runout accuracy better than 0,003 mm (see below).
- Quick assembly method of the tool. No special equipment is needed.
- Standard balanced for 10 000 RPM (G6.3). Can be supplied fine balanced to 30 000 RPM (G2.5)
- The widest range of hydrochucks on the market. Available for all applications.
- If our standard assortment doesn't cover your needs, we can design custom chucks just for you.

Benefits of using SPV Spintec's hydrochucks

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

Runout accuracy

All of our different models of hydrochucks are made with a runout accuracy better than 0,003 mm. This allows for precision machining with closer tolerances. It also extends the tool lifetime



Our different types of hydrochucks



▲ **HCF / HCF+**
Short standard chuck



▲ **HCFL / HCFL+**
Standard chuck with extended length



▲ **HCP+**
Pen-chuck in two different lengths



▲ **HCPK+**
Long tapered chuck

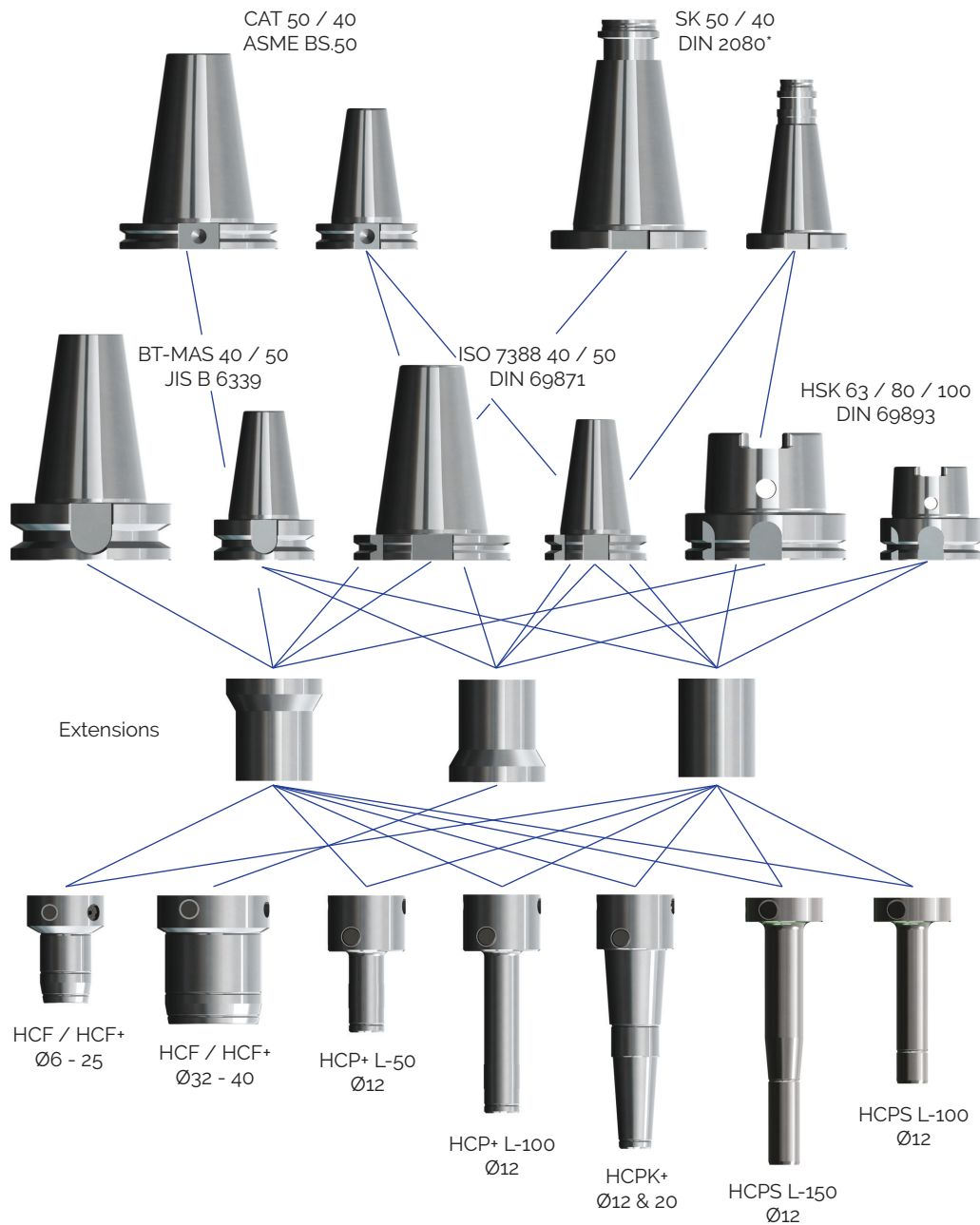


▲ **HCK+**
Extra short and powerful chuck



▲ **HCPS**
Extra long and narrow pen-chuck

Optional combinations for SPV Spintec hydrochucks



* Hydrochucks with DIN 2080 available on request.
Please contact us for more information.

HYDROCHUCKS

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 hydrochucks

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

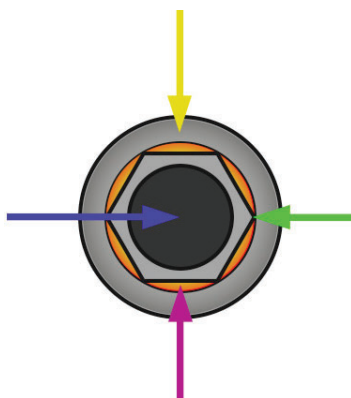
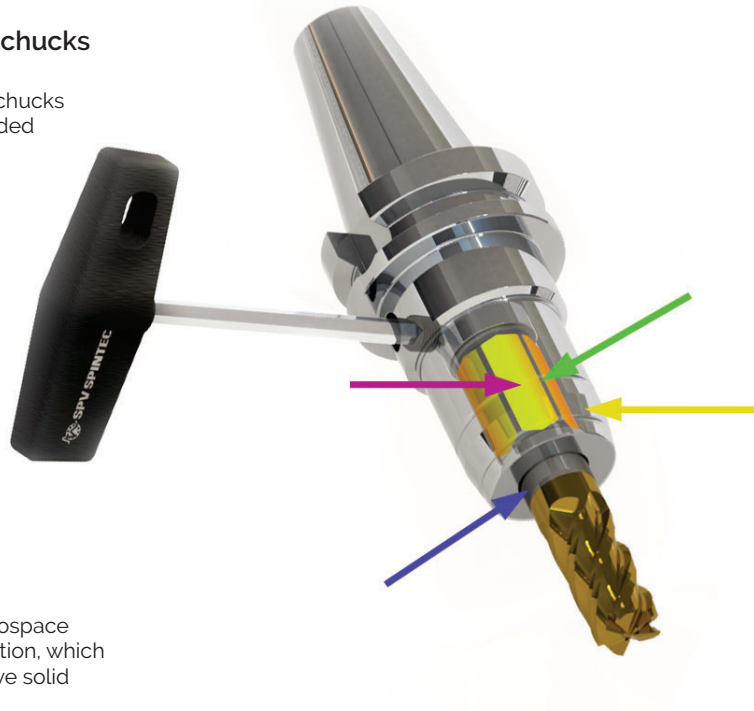
Customers have often been obliged to purchase specially shortened hydraulic milling-chucks with increased torque when they have needed to remove a large amount of material in the shortest possible time.

We have eliminated this limitation and offer our customers the opportunity of using our developed hydraulic milling-membrane for both milling and other operations, resulting in a 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 carbide cutting tools.

British Aerospace tried several commercially available retention systems but didn't find a satisfactory solution. At that time SPV developed the hydrochucks with the hexagonal membrane which was found in tests at BA to multiply the period of contact several times over. In some cases it even enabled them to double both radial and axial cutting depths.



Yellow arrow

Outer body of the hydrochuck.

Blue arrow

The cutting tool shaft (drill, cutter etc.)

Purple arrow

The hydraulic chamber which combined with high hydraulic pressure provides a stable anchorage. The long, linear, thin wall gripping-surfaces protects the tool from flexing.

Green arrow

The remaining material between the hydraulic chambers creates reinforcement ribs, which minimize vibrations and stabilizes the membrane.

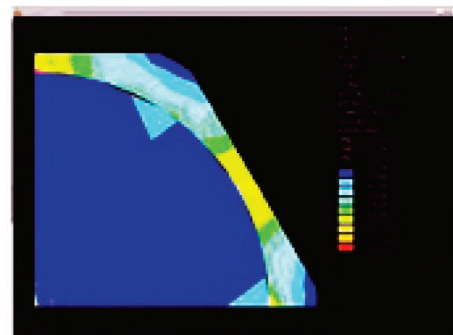
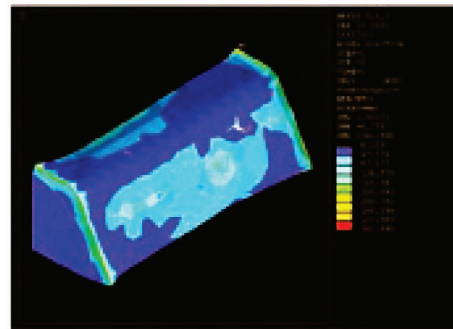
Analysis

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

Testing

A trial was done in the spring of 2003 at SECO tools in Fagersta, Sweden to 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:**
Hydrochucks HCF+ with hexagonal membrane
- **Machining tools:**
Solid 3-blade carbide metal cutters made by Jabro, with Tribon coating.
Dimensions: Ø10 mm, Ø12 mm and Ø20 mm.
- **Work piece material:**
Square bar, 75 x 75 mm made from heat treatable steel SS 2244-05, hardness 270 - 315 HB.



Test summary

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

HCF+ chucks

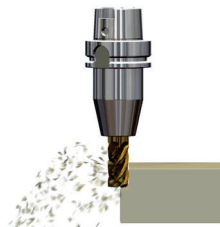
- Hydrochucks HCF+ with tools Ø10, Ø12 and Ø20 can manage the cutting data in Jabro's recommendation for coarse slab milling.
- 2 x the recommended axial cutting depth is quite OK, without any vibrations arising that could damage the cutting tool.
- 2 x the recommended radial cutting depth is quite OK.

Specifications

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

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

Results in 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+ tests with twice the recommended depth of cut, axial and radially.

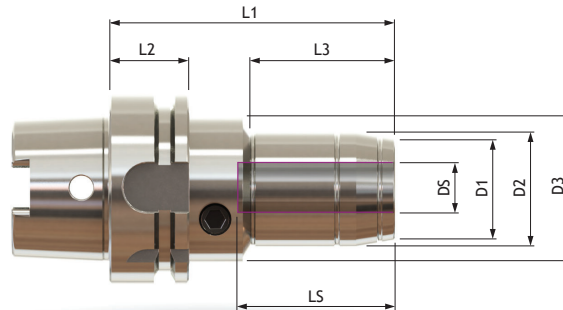
Results in a chip area of:
 $1 \times D \text{ mm} \times 0,4 \times D \text{ mm} = 0,4 \times D \text{ mm}^2$



HYDROCHUCKS

HSK-A

HCF / HCF+

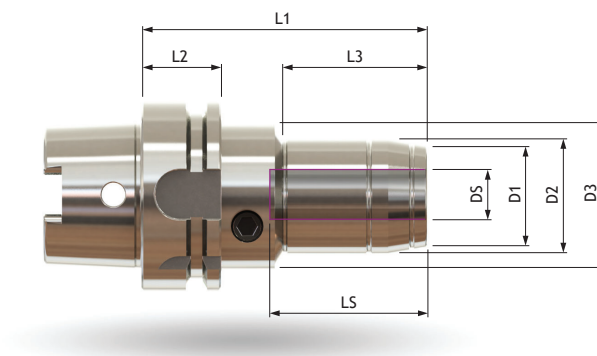


For chuck with Plus-membrane, specify + after art.no

DS Ømm	Mount type.	D1 Ømm	D2 Ømm	D3 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Art.no
6	HSK-A63	21,5	26	50	71,5	26	24,5	37,5	54870
	HSK-A80	21,5	26	48	127	26	43,5	37,5	56670
	HSK-A100	21,5	26	48	140	29	43,5	37,5	56680
8	HSK-A63	24	28	50	71,5	26	25,5	37,5	54871
	HSK-A80	23,5	28	48	127	26	43,5	37,5	56671
	HSK-A100	23,5	28	48	140	29	43,5	37,5	56681
10	HSK-A63	26	30	50	81,5	26	35,5	42,5	54872
	HSK-A80	25,5	30	48	127	26	43,5	42,5	56672
	HSK-A100	25,5	30	48	140	29	43,5	42,5	56682
12	HSK-A40	28	32	42	94,5	20	41,5	47,5	54853
	HSK-A50	28	32	42	86,5	26	43,5	47,5	54863
	HSK-A63	28	32	50	86,5	26	41,5	47,5	54873
	HSK-A80	27,5	32	48	127	26	44,5	47,5	56673
	HSK-A100	27,5	32	48	140	29	44,5	47,5	56683
	HSK-A63	30	34	50	86,5	26	41,5	47,5	54874
14	HSK-A80	29,5	34	48	127	26	44,5	47,5	56674
	HSK-A100	29,5	34	48	140	29	44,5	47,5	56684
16	HSK-A63	34	38	50	91,5	26	48	52,5	54875
	HSK-A80	33,5	38	48	127	26	47,5	52,5	56675
	HSK-A100	33,5	38	48	140	29	47,5	52,5	56685
18	HSK-A63	35,5	40	50	91,5	26	48,5	52,5	54876
	HSK-A80	35,5	40	48	127	26	47,5	52,5	56676
	HSK-A100	35,5	40	48	140	29	47,5	52,5	56686

= dimension compatible with reduction sleeve.

Other dimensions (DS) with HSK-40 and HSK-50 on request.



For chuck with Plus-membrane, specify + after art.no

DS Ømm	Mount type.	D1 Ømm	D2 Ømm	D3 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Art.no
20 ▲	HSK-A50	38	42	42	91,5	20	65,5	51	54867
	HSK-A63	38	42	50	91,5	26	49,5	52,5	54877
	HSK-A80	37,5	42	48	127	26	47,5	52,5	56677
	HSK-A100	37,5	42	48	140	29	47,5	52,5	56687
25	HSK-A63	53	57	63	121	26	52	61	54878
	HSK-A80	43,5	48	48	131	26	105	55	56678
	HSK-A100	43,5	48	48	144	29	115	55	56688
32 ▲	HSK-A63	60	64	75	126	26	62	65	54879
	HSK-A80	55,5	60	70	140	26	57	65	56679
	HSK-A100	55,5	60	70	153	29	57	65	56689

▲ = dimension compatible with reduction sleeve.

Other dimensions (DS) with HSK-40 and HSK-50 on request..

We also manufacture other types of HSK-mounts. Contact us for more info.



HSK-C



HSK-E

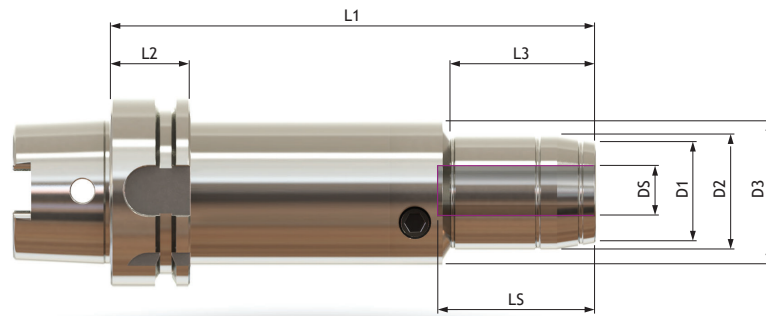


HSK-F

HYDROCHUCKS

HSK-A

HCFL / HCFL+



For chuck with Plus-membrane, specify + after art.no

DS Ømm	Mount type.	D1 Ømm	D2 Ømm	D3 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Art.no
6	HSK-A63	21,5	26	48	140	26	43,5	37,5	56660
	HSK-A63	21,5	26	48	140 - 515	26	43,5	37,5	▲
	HSK-A80	21,5	26	48	167	26	43,5	37,5	56690
	HSK-A80	21,5	26	48	167 - 510	26	43,5	37,5	▲
	HSK-A100	21,5	26	48	180	29	43,5	37,5	56760
	HSK-A100	21,5	26	48	180 - 500	29	43,5	37,5	▲
8	HSK-A63	23,5	28	48	140	26	43,5	37,5	56661
	HSK-A63	23,5	28	48	140 - 515	26	43,5	37,5	▲
	HSK-A80	23,5	28	48	167	26	43,5	37,5	56691
	HSK-A80	23,5	28	48	167 - 510	26	43,5	37,5	▲
	HSK-A100	23,5	28	48	180	29	43,5	37,5	56761
	HSK-A100	23,5	28	48	180 - 500	29	43,5	37,5	▲
10	HSK-A63	25,5	30	48	140	26	43,5	42,5	56662
	HSK-A63	25,5	30	48	140 - 515	26	43,5	42,5	▲
	HSK-A80	25,5	30	48	167	26	43,5	42,5	56692
	HSK-A80	25,5	30	48	167 - 510	26	43,5	42,5	▲
	HSK-A100	25,5	30	48	180	29	43,5	42,5	56762
	HSK-A100	25,5	30	48	180 - 500	29	43,5	42,5	▲
12 ▲	HSK-A63	27,5	32	48	140	26	44,5	47,5	56663
	HSK-A63	27,5	32	48	140 - 515	26	44,5	47,5	▲
	HSK-A80	27,5	32	48	167	26	44,5	47,5	56693
	HSK-A80	27,5	32	48	167 - 510	26	44,5	47,5	▲
	HSK-A100	27,5	32	48	180	29	44,5	47,5	56763
	HSK-A100	27,5	32	48	180 - 500	29	44,5	47,5	▲

▲ = dimension compatible with reduction sleeve.

▲ = Specify art.no / L1 on order (L1 = length of your choice).

HYDROCHUCKS

HSK-A

HCFL / HCFL+

D5 Ømm	Mount type.	D1 Ømm	D2 Ømm	D3 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Art.no
14	HSK-A63	29,5	34	48	140	26	44,5	52,5	56664
	HSK-A63	29,5	34	48	140 - 515	26	44,5	52,5	▲
	HSK-A80	29,5	34	48	167	26	44,5	52,5	56694
	HSK-A80	29,5	34	48	167 - 510	26	44,5	52,5	▲
	HSK-A100	29,5	34	48	180	29	44,5	52,5	56764
	HSK-A100	29,5	34	48	180 - 500	29	44,5	52,5	▲
16	HSK-A63	33,5	38	48	140	26	47,5	52,5	56665
	HSK-A63	33,5	38	48	140 - 515	26	47,5	52,5	▲
	HSK-A80	33,5	38	48	167	26	47,5	52,5	56695
	HSK-A80	33,5	38	48	167 - 510	26	47,5	52,5	▲
	HSK-A100	33,5	38	48	180	29	47,5	52,5	56765
	HSK-A100	33,5	38	48	180 - 500	29	47,5	52,5	▲
18	HSK-A63	35,5	40	48	140	26	47,5	52,5	56666
	HSK-A63	35,5	40	48	140 - 515	26	47,5	52,5	▲
	HSK-A80	35,5	40	48	167	26	47,5	52,5	56696
	HSK-A80	35,5	40	48	167 - 510	26	47,5	52,5	▲
	HSK-A100	35,5	40	48	180	29	47,5	52,5	56766
	HSK-A100	35,5	40	48	180 - 500	29	47,5	52,5	▲
20 ▲	HSK-A63	37,5	42	48	140	26	47,5	52,5	56667
	HSK-A63	37,5	42	48	140 - 515	26	47,5	52,5	▲
	HSK-A80	37,5	42	48	167	26	47,5	52,5	56697
	HSK-A80	37,5	42	48	167 - 510	26	47,5	52,5	▲
	HSK-A100	37,5	42	48	180	29	47,5	52,5	56767
	HSK-A100	37,5	42	48	180 - 500	29	47,5	52,5	▲
25	HSK-A63	43,5	48	48	144	26	118	55	56668
	HSK-A63	43,5	48	48	144 - 515	26	-----	55	▲
	HSK-A80	43,5	48	48	171	26	145	55	56698
	HSK-A80	43,5	48	48	171 - 510	26	-----	55	▲
	HSK-A100	43,5	48	48	184	29	155	55	56768
	HSK-A100	43,5	48	48	184 - 500	29	-----	55	▲
32 ▲	HSK-A63	55,5	60	70	193	26	57	65	56669
	HSK-A63	55,5	60	70	153 - 515	26	57	65	▲
	HSK-A80	55,5	60	70	180	26	57	65	56699
	HSK-A80	55,5	60	70	180 - 510	26	57	65	▲
	HSK-A100	55,5	60	70	193	29	57	65	56769
	HSK-A100	55,5	60	70	193 - 500	29	57	65	▲

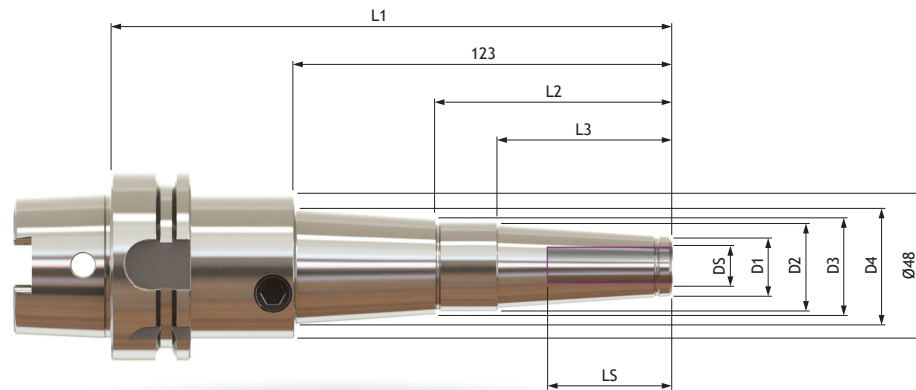
▲ = dimension compatible with reduction sleeve.

▲ = Specify art.no / L1 on order (L1 = length of your choice).

HYDROCHUCKS

HSK-A

HCPK+

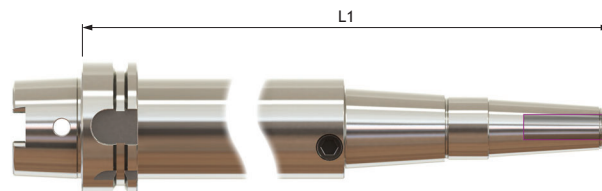


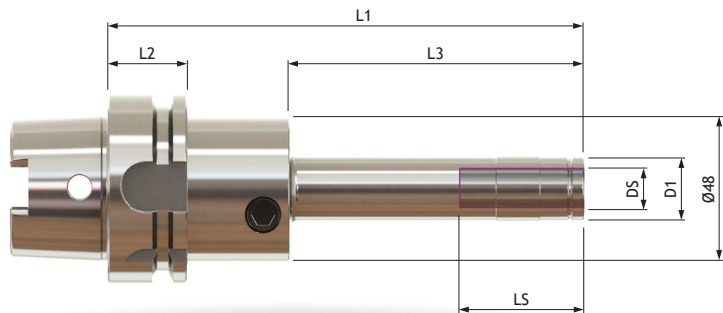
DS Ømm	Mount type.	D1 Ømm	D2 Ømm	D3 Ømm	D4 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Art.no
12	HSK-A63	20	30	32	40,5	197	76,8	57	44	54103+
	HSK-A63	20	30	32	40,5	237 - 515	76,8	57	44	
	HSK-A80	20	30	32	40,5	217	76,8	57	44	54113+
	HSK-A80	20	30	32	40,5	257 - 510	76,8	57	44	
	HSK-A100	20	30	32	40,5	230	76,8	57	44	54123+
	HSK-A100	20	30	32	40,5	270 - 500	76,8	57	44	
20	HSK-A63	32	39	42	50,5	197	74,8	55	52	54107+
	HSK-A63	32	39	42	50,5	237 - 515	74,8	55	52	
	HSK-A80	32	39	42	50,5	217	74,8	55	52	54117+
	HSK-A80	32	39	42	50,5	257 - 510	74,8	55	52	
	HSK-A100	32	39	42	50,5	230	74,8	55	52	54127+
	HSK-A100	32	39	42	50,5	270 - 500	74,8	55	52	

= dimension compatible with reduction sleeve.

= Specify art.no / L1 on order (L1 = length of your choice).

Choose your own length (L1) of HCPK+. Specify Art.no / L1 on order.





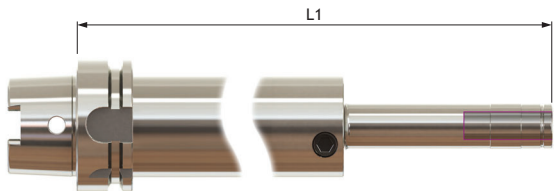
Short model



D5 Ømm	Mount type.	D1 Ømm	L1 mm	L2 mm	L3 mm	L5 mm	Art.no
12	HSK-A63	22,5	125	26	50	44	59303+
	HSK-A63	22,5	175	26	100	44	59313+
	HSK-A80	22,5	145	26	50	44	59238+
	HSK-A80	22,5	195	26	100	44	59243+
	HSK-A100	22,5	158	29	50	44	59353+
	HSK-A100	22,5	208	29	100	44	59363+

= dimension compatible with reduction sleeve.

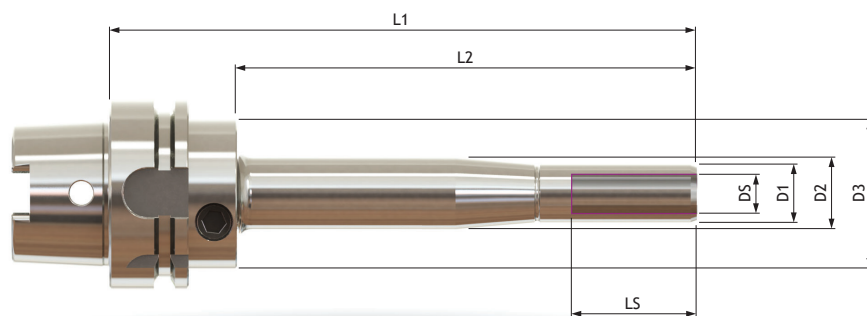
Choose your own length (L1) of HCP+. Specify Art.no / L1 on order.



HYDROCHUCKS

HSK-A

HCPS



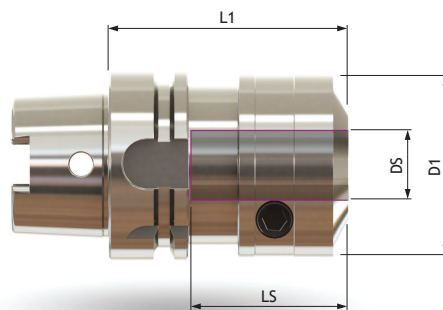
Short model



DS Ømm	Mount type.	D1 Ømm	D2 Ømm	D3 Ømm	L1 mm	L2 mm	L3 mm	LS mm	Art.no
12	HSK-A63	19,5	----	48	155	100	----	42	59643
	HSK-A80	19,5	----	48	175	100	----	42	59653
	HSK-A100	19,5	----	48	188	100	----	42	59663
	HSK-A63	19,5	24	48	205	150	52	42	59743
	HSK-A80	19,5	24	48	225	150	52	42	59753
	HSK-A100	19,5	24	48	238	150	52	42	59763

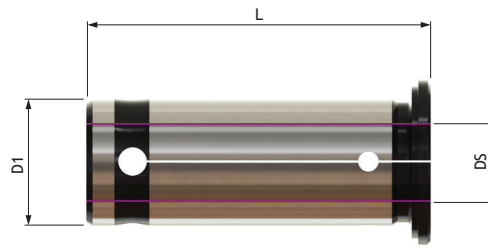
= dimension compatible with reduction sleeve.

HCK+



DS Ømm	Mount type.	D1 Ømm	L1 mm	LS mm	Art.no
20	HSK-A63	61	78	51,8	66109+
32	HSK-A63	82	88	61,8	66111+

Reduction Sleeves



Sealed sleeve with rubber stop.

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

Other dimensions on request.

Reduction sleeves D = mm

D1 Ømm	DS Ømm	L mm	Art.no
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
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

D1 Ømm	DS Ømm	L mm	Art.no
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
1 1/4"	9/16"		67968
	5/8"		67969
	3/8"		67980
	1/2"		67981
	5/8"		67982
	3/4"		67983
	1"		67984

Custom sleeves

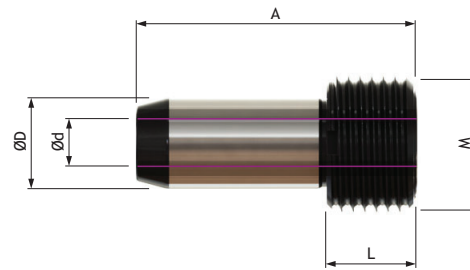
We also provide sleeves with custom clamping diameter (DS).

Please contact us for more info.

HYDROCHUCKS

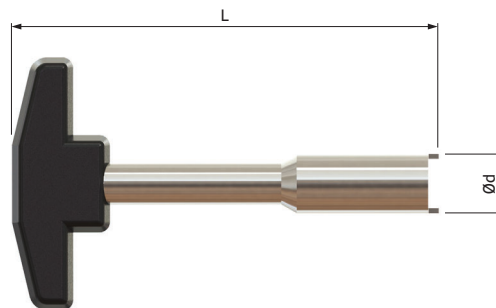
Accessories

Coolant-adaptor for HSK



For HSK-size	ØD mm	A mm	Ød mm	L mm	M	Art.no
HSK-A32 , HSK-E32 , HSK-F40	6	25,7	3,5	5,5	M10 x 1	HSKA.32.0100
HSK-A40 , HSK-E40 , HSK-F50	8	29	5	7,5	M12 x 1	HSKA.40.0120
HSK-A50 , HSK-E50 , HSK-F63	10	33	6,4	10	M16 x 1	HSKA.50.0160
HSK-A63 , HSK-E63 , HSK-F80	12	36,2	8	11,5	M18 x 1	HSKA.63.0180
HSK-A80 , HSK-E80 , HSK-F100	14	39,6	10	13,5	M20 x 1,5	HSKA.80.0200
HSK-A100 , HSK-E100 , HSK-F125	16	43,6	12	15,5	M24 x 1,5	HSKA.100.0240

Key to coolant-adaptor for HSK



For HSK-size	ØD mm	L mm	Art.no
HSK-A32 , HSK-E32 , HSK-F40	9	110	CH.HSK.0320
HSK-A40 , HSK-E40 , HSK-F50	11	110	CH.HSK.0400
HSK-A50 , HSK-E50 , HSK-F63	15	120	CH.HSK.0500
HSK-A63 , HSK-E63 , HSK-F80	17	120	CH.HSK.0630
HSK-A80 , HSK-E80 , HSK-F100	18,5	130	CH.HSK.0800
HSK-A100 , HSK-E100 , HSK-F125	22	140	CH.HSK.1000

HYDROCHUCKS

Customized hydrochuck solutions

Specially designed for you

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



HYDROCHUCKS

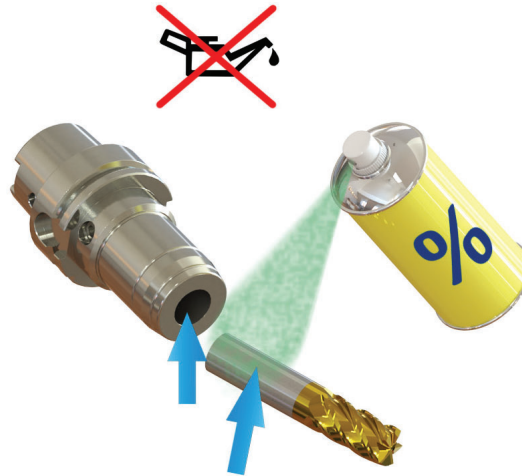
Operating instructions

- 1. Working temperature

Ideal and optimized working temperature is between 20° and 50°C. Do not store hydrochucks where the temperature could exceed 50°C.

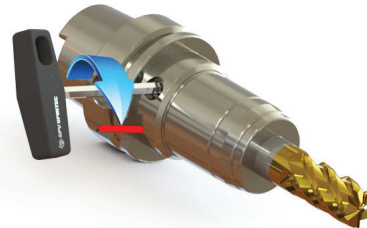
- 2. Cleaning

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



- 3. Tightening the membrane

The screw must always be tightened to the fixed stop. No torque-key is needed. Never tighten the screw without a tool in the chuck, since there is a risk that the hydraulic chamber could be deformed.

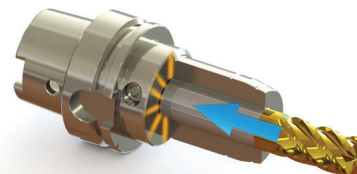


- 4. Tool insertion length

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 tool shaft length must be inserted and clamped.

- 5. Service and repair

If you experience that your hydrochuck does not clamp properly, this can be due to several issues. A common explanation is that the hydraulic piston seal is worn out. We always recommend sending the chuck to us for service or repair. Contact us for more info.



Important information about tool shafts.

- **Hydrochucks with standard membrane - HCF / HCFL / HCPS**

For standard chucks from Ø6 to Ø20 mm, Weldon-shafts can be used directly in the chuck.
Shaft tolerance = h6

- **Hydrochucks with The Plus-membrane - HCF+ / HCFL+ / HCP+ / HCPK+ / HCK+**

For chucks with The Plus-membrane (+) only cylindrical shafts must be used directly in the chuck.
Shaft tolerance = h6

- **Reduction sleeves - (Not suitable for HCK+)**

Other types of tool shafts such as Weldon, Whistlenotch etc can be used in combination with a reduction sleeve in the hydrochuck.

Torque specifications

Chuck for tool Ø mm	HCF / HCF+	HCK+	HCP+	HCPK+	HCPS
6	15 Nm				
8	20 Nm				
10	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 hydrochuck requires special tools and equipment.
Always send the chuck to SPV Spintec representative if it needs to be repaired.