



NEW
CAT DUAL CONTACT
and HSK Models



FRANKEN
HIGH PRECISION
FPC MILLING/DRILLING CHUCKS

The Ultimate Precision Chuck

1. World's only chuck with 1:16 worm gear, a patented design delivering 3 tons of traction force.

2. Optimal Pull-Out Protection via optional Pin-Lock Collet System.

3. High rigidity. Patented design and body provides 100% holding power.

4. Mechanical drive actuated with a hex wrench. Simple design, highly accurate.

5. Maximum dampening. Collet-cone assembly absorbs virtually all vibration.

**EMUGE
FRANKEN**

in Partnership with

ALBRECHT
Precision Chucks

E MUGE-FRANKEN high precision/performance FPC Mill/Drill Chucks provide unprecedented rigidity, vibration dampening, concentricity, machining speed, and tool life vs. conventional chuck technologies for milling and drilling applications. Available in a wide range of styles. Internal and peripheral coolant options, and MQL-adaptable.

Increase your machining speed and tool life to the highest possible levels.

EMUGE-FRANKEN FPC Chuck Advantages:

- **Reliability**
Extremely high transferable torque provides maximum process reliability.
- **More accurate**
With a 3XD tool length, concentricity is $\leq 3 \mu\text{m}$, guaranteeing long tool life and quality surface finishes.
- **Longer tool life**
Special holder design reduces vibration, dramatically improving work piece surface finishes and providing exceptionally long tool life.
- **Fast tool change**
Simple, highly accurate design enables quick tool change in seconds, via hex wrench.

The Fastest Chuck in the West, east, north, and south.

In a speed comparison with four chuck technologies, using a 16mm end mill in the same material, the EMUGE-FRANKEN FPC Chuck is the clear winner.

Winner by 00:25!

	15.75"
Hydraulic	12.60"
Weldon	11.81"
Shrink Fit	11.00"

CAT		CAT SLIM LINE		CAT DUAL CONTACT		HSK-A		
				 NEW				
CAT 40 1/8" - 1 1/4" 2 - 32 mm	CAT 50 1/8" - 1 1/4" 2 - 32 mm	CAT 40 1/8" - 3/4" 2 - 20 mm		CAT 40 1/8" - 3/4" 2 - 20 mm	CAT 50 1/8" - 1 1/4" 2 - 32 mm	A63, A80, A100 1/8" - 1 1/4" 2 - 32 mm	A125 1/2" - 1 1/4" 16 - 32 mm	F63 1/8" - 3/4" 2 - 20 mm
6494		6494S		6488		6476 6478		
page 6		page 7		page 8		page 9		

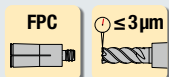
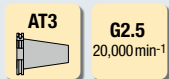
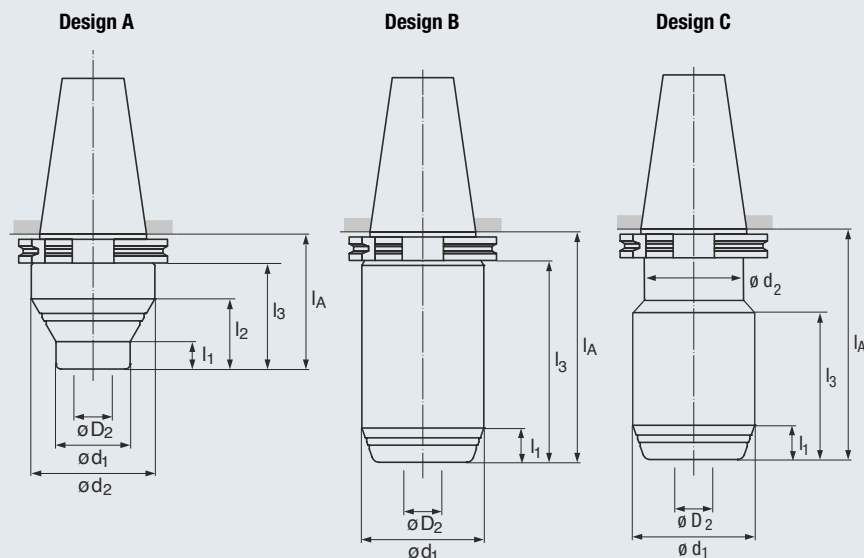
HSK-A63 SLIM LINE		HSK FM80		SK		SK SLIM LINE	
		 NEW					
HSK-A63 1/8" - 3/4" 2 - 20 mm		HSK FM80 1/8" - 1 1/4" 2 - 32 mm		SK30 1/8" - 9/16" 2 - 20 mm	SK40 1/8" - 1 1/4" 2 - 32 mm	SK50 1/8" - 1 1/4" 2 - 32 mm	SK40 1/8" - 3/4" 2 - 20 mm
6476S		6489		6491			6491S
page 10		page 11		page 12		page 13	

BT		BT SLIM LINE		PSC		PSC SLIM LINE	
							
BT30 1/8" - 3/4" 2 - 20 mm	BT40 1/8" - 1 1/4" 2 - 32 mm	BT50 1/8" - 1 1/4" 2 - 32 mm	BT40 1/8" - 3/4" 2 - 20 mm	C5 1/8" - 3/4" 2 - 20 mm	C6 1/8" - 1 1/4" 2 - 32 mm	C7 1/8" - 1 1/4" 2 - 32 mm	PSC63 1/8" - 3/4" 2 - 20 mm
6493			6493S	6496	6477		6477S
page 14		page 15		page 16		page 17	

CAT MICRO	HSK-A MICRO	HSK-E MICRO	SK MICRO
 CAT 40 1/8" - 1/4" 1 - 6 mm 6394	 HSK 40-A HSK 50-A HSK 63-A 1/8" - 1/4" 1/8" - 1/4" 1/8" - 1/4" 1 - 6 mm 1 - 6 mm 1 - 6 mm 6392	 HSK 40-E HSK 50-E 1/8" - 1/4" 1/8" - 1/4" 1 - 6 mm 1 - 6 mm 6399	 SK30 SK40 1/8" - 1/4" 1/8" - 1/4" 1 - 6 mm 1 - 6 mm 6391
page 20	page 20	page 20	page 21
BT MICRO	PSC MICRO	FMC COLLETS	FPC COLLETS
 BT30 BT40 1/8" - 1/4" 1/8" - 1/4" 1 - 6 mm 1 - 6 mm 6393	 PSC40 PSC63 1/8" - 1/4" 1/8" - 1/4" 1 - 6 mm 1 - 6 mm 6396	 FMC 1/8" - 1/4" 1 - 6 mm 6648 / 6649	 FPC14 FPC20 FPC25 1/8" - 9/16" 1/8" - 3/4" 5/8" - 1 1/4" 2 - 14 mm 2 - 20 mm 16 - 32 mm 6638 / 6639
page 21	page 22	page 22	page 23
FPC PIN-LOCK COLLETS	FPC PIN-LOCK COLLETS 2.0	MICRO COLLET EXTENSIONS	FPC / FMC ACCESSORIES
 FPC20 FPC25 1/4" - 5/8" 1/2" - 1" 6 - 18 mm 16 - 25 mm 6637 / 6633	 FPC20 FPC25 1/4" - 5/8" 1/2" - 1" 6 - 16 mm 16 - 25 mm 6631	 FMC 1/8" - 1/4" 1 - 6 mm 6395	
page 24	page 25	page 26	pages 26 - 29

- Taper shank acc. ASME B5.50-2009
- Taper quality AT3
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

CAT

 $\leq 3 \mu\text{m}$ G2.5
20,000 min-1

Icon descriptions (see page 31)



CAT 40

SIZE	D2 (Range)		Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	A	30	50	11	28	43	62	6494.401406*
	1/8" - 9/16"	2 mm - 14 mm	A	30	50	61	78	93	112	6494.401411
	1/8" - 9/16"	2 mm - 14 mm	A	30	50	85	103	129	148	6494.401414*
FPC20	1/8" - 3/4"	2 mm - 20 mm	A	40	50	20	28	43	62	6494.402006*
	1/8" - 3/4"	2 mm - 20 mm	A	40	50	69	78	93	112	6494.402011*
	1/8" - 3/4"	2 mm - 20 mm	A	40	50	94	103	129	149	6494.402014
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	C	63	50	14	-	61	102	6494.402510

CAT 50

SIZE	D2 (Range)		Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC20	1/8" - 3/4"	2 mm - 20 mm	A	40	63	18	38	43	62	6494.502006
	1/8" - 3/4"	2 mm - 20 mm	A	40	63	84	104	129	149	6494.502014
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	B	70	-	15	-	83	102	6494.502510

NOTE: Mechanical drive torque wrench must be set at max. 10 Nm / 7.38 ft-lbs

FPC Collets and Accessories (see pages 23-29, please order separately)

Pull stud threads are UNC standard



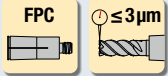
* Caution: tool does not have a safety zone.

Be sure to check for tool changer interference before using.

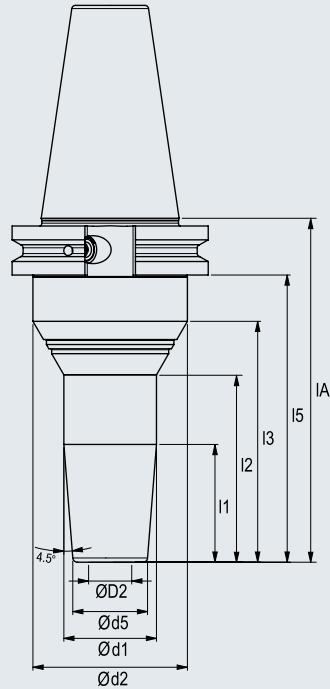
- Taper shank acc. ASME B5.50-2009
- Taper quality AT3
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

CAT

Slim line



Icon descriptions (see page 31)



*Slim Line Design
Ideal for 5-Axis*

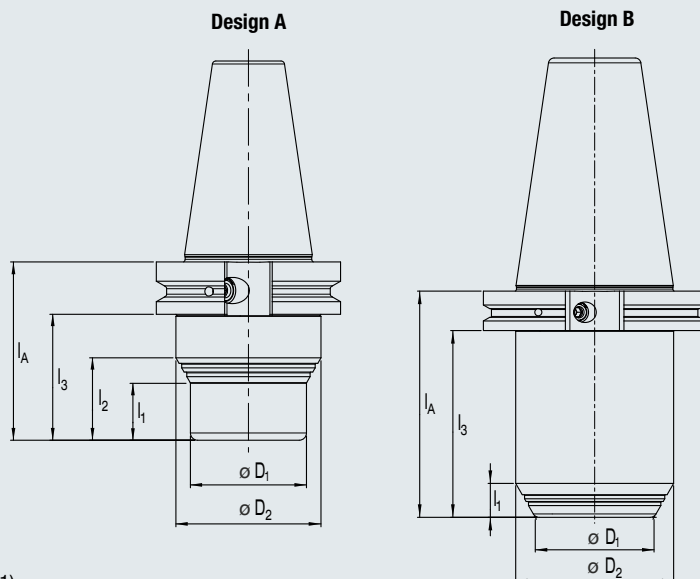
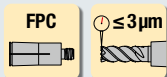
CAT 40 SLIM LINE

SIZE	D2 (Range)		d ₁	d ₂	d ₅	l ₁	l ₂	l ₃	l ₅	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	-	56	71	90	6494S.401409
	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	61	78	93	112	6494S.401411
	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	85	103	129	148	6494S.401414
FPC20	1/8" - 3/4"	2 mm - 20 mm	39	50	32	44	-	54	71	90	6494S.402009
	1/8" - 3/4"	2 mm - 20 mm	40	50	32	51	69	78	93	112	6494S.402011
	1/8" - 3/4"	2 mm - 20 mm	40	50	32	51	94	103	129	148	6494S.402014

NOTE: Mechanical drive torque wrench must be set at **max. 10 Nm / 7.38 ft-lbs**

FPC Collets and Accessories (see pages 23-29, please order separately)

- Dual Contact style holder with taper-to-taper contact and clamped by a drawbar
- 0.125" gap between machine tool spindle face and tool holder flange reduces chatter and increases tool life
- Tolerances according to AT3 or better, other dimensions see ANSI B5.50-AD40
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

CAT

Icon descriptions (see page 31)

**CAT 40**

SIZE	Range		Design	D ₁	D ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC20	1/8" - 3/4"	2 mm - 20 mm	A	40	50	20	28	43	61	6488.402006 NEW
	1/8" - 3/4"	2 mm - 20 mm	A	40	50	69	78	93	111	6488.402011 NEW
	1/8" - 3/4"	2 mm - 20 mm	A	40	50	94	103	129	147	6488.402014 NEW

CAT 50

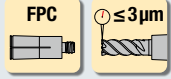
SIZE	Range		Design	D ₁	D ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC20	1/8" - 3/4"	2 mm - 20 mm	A	40	63	18	38	43	61	6488.502006 NEW
	1/8" - 3/4"	2 mm - 20 mm	A	40	63	84	104	129	147	6488.502014 NEW
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	B	53	70	15	—	83	100	6488.502510 NEW

FPC Collets and Accessories (see pages 23-29, please order separately)

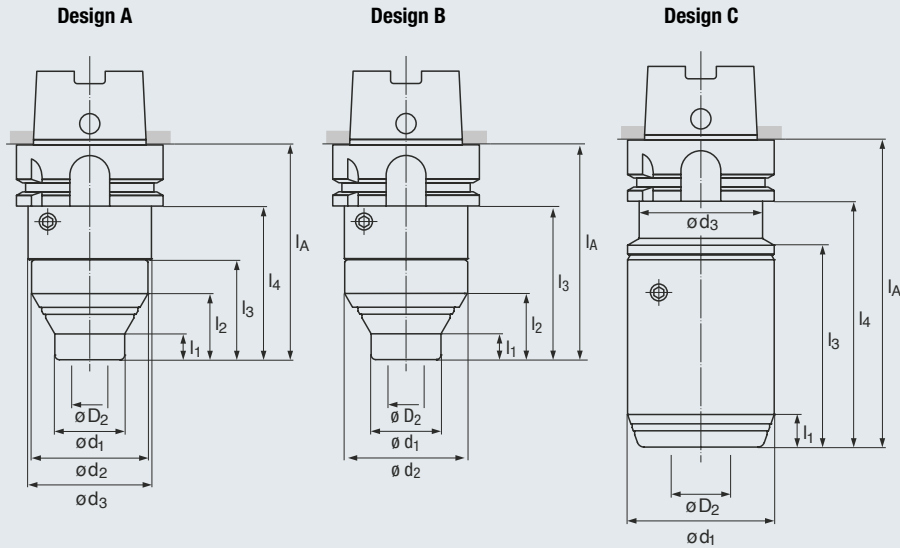
To access STP, DXF programming files login / register at www.emuge.com.

- Hollow taper shank acc. DIN 69893-1
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

HSK-A



G2.5
20,000 min⁻¹



Icon descriptions (see page 31)



HSK-A63 – Fine Balancing Holes with 6xM6 Threads

SIZE	D2 (Range)		Design	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	A	30	50	53	11	28	43	66	92	6476.631409
	1/8" - 9/16"	2 mm - 14 mm	A	30	50	53	61	78	93	116	142	6476.631414
	1/8" - 9/16"	2 mm - 14 mm	A	30	50	53	85	103	129	152	178	6476.631417
FPC20	1/8" - 3/4"	2 mm - 20 mm	B	40	53	-	20	31	66	-	92	6476.632009
	1/8" - 3/4"	2 mm - 20 mm	B	40	53	-	69	81	116	-	142	6476.632014
	1/8" - 3/4"	2 mm - 20 mm	B	40	53	-	94	105	152	-	178	6476.632017
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	C	63	-	53	14	-	87	106	132	6476.632513

HSK-A80 – Fine Balancing Holes with 6xM6 Threads

SIZE	D2 (Range)	Design	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l _A	EDP No.
FPC20	1/8" - 3/4" 2 mm - 20 mm	B	40	63	-	18	38	72	-	98	6476.802009
FPC25	1/2" - 1 1/4" 16 mm - 32 mm	C	63	-	-	14	-	-	111	137	6476.802513

HSK-A100 – Fine Balancing Holes with 6xM6 Threads

SIZE	D2 (Range)		Design	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l _A	EDP No.
FPC20	1/8" - 3/4"	2 mm - 20 mm	A	40	63	70	18	38	43	71	100	6476.102010
	1/8" - 3/4"	2 mm - 20 mm	A	40	63	70	48	68	93	121	150	6476.102015
	1/8" - 3/4"	2 mm - 20 mm	A	40	63	70	84	104	129	157	186	6476.102018
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	C	70	-	-	15	-	-	110	139	6476.102513

HSK-A125 – Fine Balancing Holes with 6xM6 Threads

SIZE	D2 (Range)	Design	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l _A	EDP No.	
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	C	70	-	-	15	-	-	116	145	6476.122514

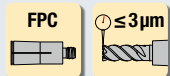
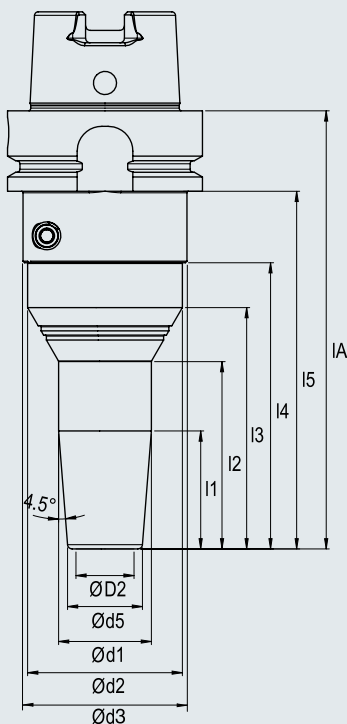
HSK-F63 – Fine Balancing Holes with 6xM6 Threads

SIZE	D2 (Range)		Design	d ₁	d ₂	d ₃	l ₁	l ₂	l ₃	l ₄	l _A	EDP No.
FPC20	1/8" - 3/4"	2 mm - 20 mm	B	40	53	-	20	31	66	-	92	6478.632009

NOTE: Mechanical drive torque wrench must be set at max. 10 Nm / 7.38 ft-lbs.

FPC Collets and Accessories (see pages 23-29, please order separately). Coolant tubes and assembly wrenches available upon request.

- Hollow taper shank acc. DIN 69893-1
- Slim line for 5-Axis operation
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

HSK-A**Slim line**
G2.5
 20,000 min⁻¹


Slim Line Design
Ideal for 5-Axis

Icon descriptions (see page 31)

HSK-A 63 SLIM LINE – Fine Balancing Holes with 6xM6 Threads

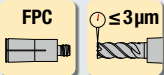
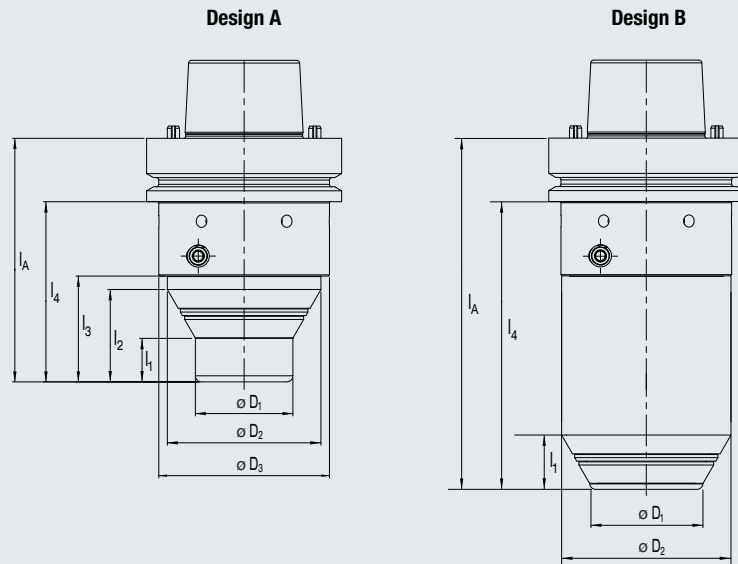
SIZE	D2 (Range)		d ₁	d ₂	d ₃	d ₅	l ₁	l ₂	l ₃	l ₄	l ₅	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	30	50	53	24	38	-	56	71	94	120	6476S.631412
	1/8" - 9/16"	2 mm - 14 mm	30	50	53	24	38	61	78	93	116	142	6476S.631414
	1/8" - 9/16"	2 mm - 14 mm	30	50	53	24	38	85	103	129	152	178	6476S.631417
FPC20	1/8" - 3/4"	2 mm - 20 mm	39	50	53	32	44	-	54	71	94	120	6476S.632012
	1/8" - 3/4"	2 mm - 20 mm	40	50	53	32	51	69	78	93	116	142	6476S.632014
	1/8" - 3/4"	2 mm - 20 mm	40	50	53	32	51	94	103	129	152	178	6476S.632017

NOTE: Mechanical drive torque wrench must be set at max. 10 Nm / 7.38 ft-lbs

FPC Collets and Accessories (see pages 23-29, please order separately)

Coolant tubes and assembly wrenches available upon request

- Dual pin mounting system provides additional stability and reliable clamping for quick tool changing
- With 2x drive-pins, Ø5 mm pins on a Ø58 mm circle
- Includes a Data Chip carrier, type BALLUFF BIS-C-122-04/L
- Includes a M18 x 1 mm thread for HSK-A63 cooling tube
- Hollow taper shank acc. DIN 69893-1
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

HSK-FM80
G2.5
 20,000 min⁻¹


Icon descriptions (see page 31)

HSK FM80

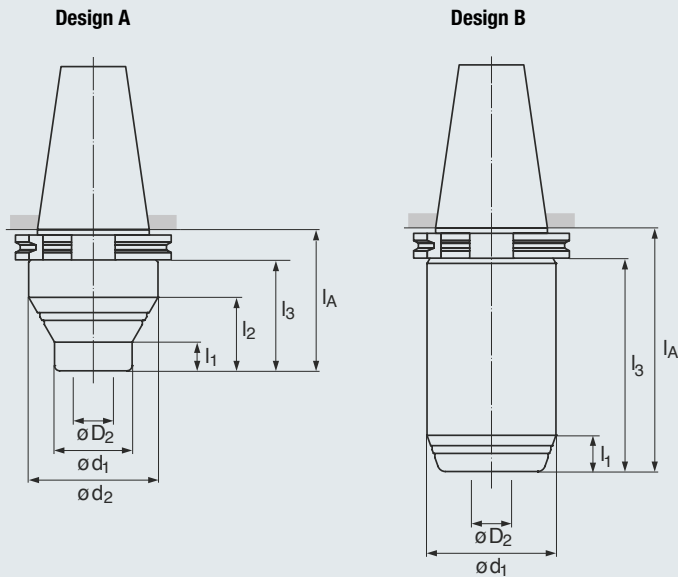
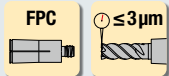
SIZE	Range	Design	D ₁	D ₂	D ₃	l ₁	l ₂	l ₃	l ₄	l _A	EDP No.	
FPC20	1/8" - 3/4"	2 mm - 20 mm	A	40	63	70	18	38	43	74	100	6489.802010 NEW
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	B	53	70	—	15	—	—	113	139	6489.802513 NEW

FPC Collets and Accessories (see pages 23-29, please order separately)

To access STP, DXF programming files login / register at www.emuge.com.

- ISO taper shank acc. DIN ISO 7388-1 (formerly DIN 69871)
- Taper quality AT3
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

SK (ISO)



Icon descriptions (see page 31)

SK30

SIZE	D2 (Range)		Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	A	30	53	11	28	73	92	6491.301409
	1/8" - 9/16"	2 mm - 14 mm	A	30	53	61	78	93	142	6491.301414
FPC20	1/8" - 9/16"	2 mm - 20 mm	A	40	53	20	28	73	92	6491.302009

SK40

SIZE	D2 (Range)		Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	A	30	50	11	28	43	62	6491.401406
	1/8" - 9/16"	2 mm - 14 mm	A	30	50	61	78	93	112	6491.401411
	1/8" - 9/16"	2 mm - 14 mm	A	30	50	85	103	129	149	6491.401414
FPC20	1/8" - 3/4"	2 mm - 20 mm	A	40	50	20	28	43	63	6491.402006
	1/8" - 3/4"	2 mm - 20 mm	A	40	50	69	78	93	112	6491.402011
	1/8" - 3/4"	2 mm - 20 mm	A	40	50	94	103	129	149	6491.402014
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	B	63	-	14	-	83	102	6491.402510*



* Caution: tool does not have a safety zone. Be sure to check for tool changer interference before using.

SK50

SIZE	D2 (Range)		Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC20	1/8" - 3/4"	2 mm - 20 mm	A	40	63	18	38	43	62	6491.502006
	1/8" - 3/4"	2 mm - 20 mm	A	40	63	48	68	93	112	6491.502011
	1/8" - 3/4"	2 mm - 20 mm	A	40	63	84	104	129	149	6491.502014
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	B	70	-	15	-	83	102	6491.502510

NOTE: Mechanical drive torque wrench must be set at max. 10 Nm / 7.38 ft-lbs

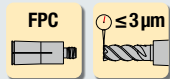
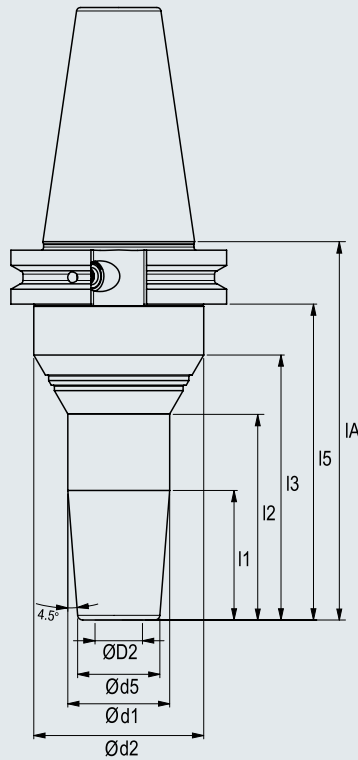
FPC Collets and Accessories (see pages 23-29, please order separately)

Pull stud threads are metric and available upon request

- ISO taper shank acc. DIN ISO 7388-1 (formerly DIN 69871)
- Slim line with 4.5° especially for 5-axis machining
- System runout accuracy 3 µm at 2.5xD
- Sealed against coolant and contamination
- Internal coolant supply
- Clamping tool shank according to DIN 1835 A, B & DIN 6535 HB, HA

SK (ISO)

Slim line

G2.5
20,000 min⁻¹

*Slim Line Design
Ideal for 5-Axis*

Icon descriptions (see page 31)

SK40 SLIM LINE

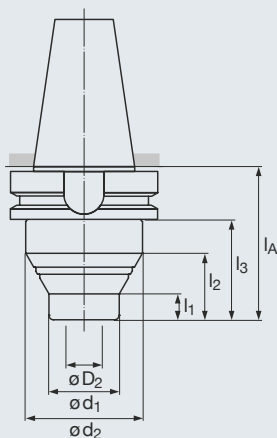
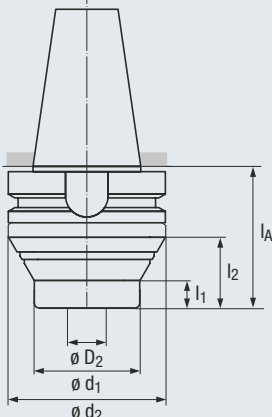
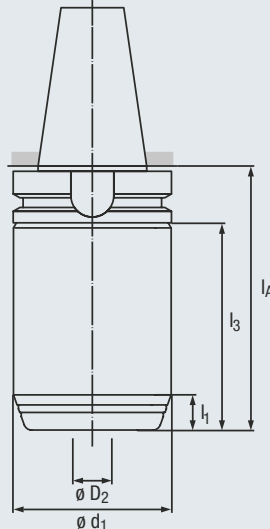
SIZE	D2 (Range)		d ₁	d ₂	d ₅	l ₁	l ₂	l ₃	l ₅	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	-	56	71	90	6491S.401409
	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	61	78	93	112	6491S.401411
	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	85	103	129	149	6491S.401414
FPC20	1/8" - 3/4"	2 mm - 20 mm	39	50	32	44	-	54	71	90	6491S.402009
	1/8" - 3/4"	2 mm - 20 mm	40	50	32	51	69	78	93	112	6491S.402011
	1/8" - 3/4"	2 mm - 20 mm	40	50	32	51	94	103	129	149	6491S.402014

NOTE: Mechanical drive torque wrench must be set at max. 10 Nm / 7.38 ft-lbs

FPC Collets and Accessories (see pages 23-29, please order separately)

Pull stud threads are metric and available upon request

- ISO taper shank acc. DIN ISO 7388-2 (formerly JIS B 6339/MAS 403 BT)
- Taper quality AT3
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

BT**FPC** $\leq 3 \mu\text{m}$ **AT3****G2.5**20,000 min⁻¹**Design A****Design B****Design C**

Icon descriptions (see page 31)

BT30

SIZE	D2 (Range)	Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC14	1/8" - 9/16" 2 mm - 14 mm	A	30	53	11	28	56	82	6493.301408
FPC20	1/8" - 3/4" 2 mm - 20 mm	A	40	53	20	31	56	82	6493.302008

BT40

SIZE	D2 (Range)	Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC14	1/8" - 9/16" 2 mm - 14 mm	A	30	50	11	28	43	70	6493.401407
	1/8" - 9/16" 2 mm - 14 mm	A	30	50	61	78	93	120	6493.401412
	1/8" - 9/16" 2 mm - 14 mm	A	30	50	85	103	129	156	6493.401415
FPC20	1/8" - 3/4" 2 mm - 20 mm	B	40	63	18	38	-	70	6493.402007
	1/8" - 3/4" 2 mm - 20 mm	B	40	63	48	68	-	120	6493.402012
	1/8" - 3/4" 2 mm - 20 mm	B	40	63	84	104	-	156	6493.402015
FPC25	1/2" - 1 1/4" 16 mm - 32 mm	C	63	-	14	-	-	110	6493.402511

BT50

SIZE	D2 (Range)	Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC20	1/8" - 3/4" 2 mm - 20 mm	A	40	63	18	38	43	81	6493.502008
	1/8" - 3/4" 2 mm - 20 mm	A	40	63	48	68	93	131	6493.502013
	1/8" - 3/4" 2 mm - 20 mm	A	40	63	84	104	129	167	6493.502016
FPC25	1/2" - 1 1/4" 16 mm - 32 mm	C	70	-	15	-	83	121	6493.502512

NOTE: Mechanical drive torque wrench must be set at max. 10 Nm / 7.38 ft-lbs

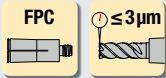
FPC Collets and Accessories (see pages 23-29, please order separately)

Pull stud threads are metric and available upon request

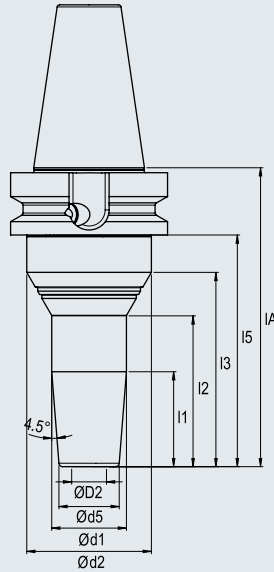
- ISO taper shank acc. DIN ISO 7388-2 (formerly JIS B 6339 / MAS-403BT)
- Slim line – ideal for 5-axis operation
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

BT

Slim line

G2.5
20,000 min⁻¹

Icon descriptions (see page 31)



*Slim Line Design
Ideal for 5-Axis*

BT40 SLIM LINE

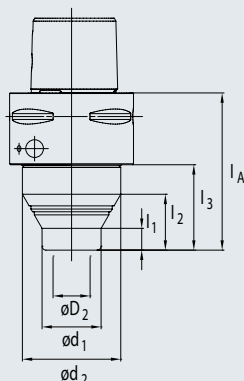
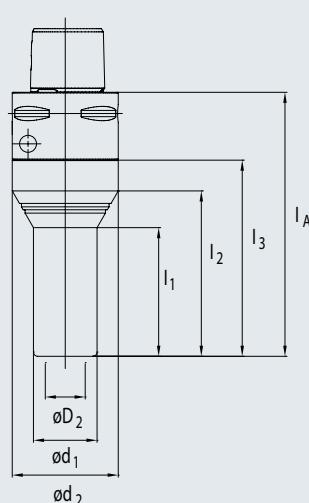
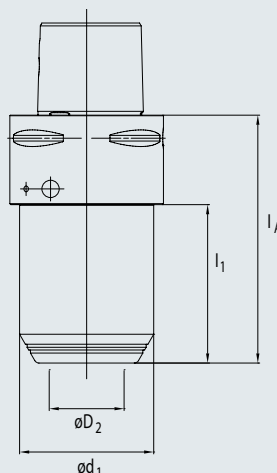
SIZE	D2 (Range)		d ₁	d ₂	d ₅	l ₁	l ₂	l ₃	l ₅	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	-	56	71	98	6493S.401409
	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	61	78	93	120	6493S.401412
	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	85	103	129	157	6493S.401415
FPC20	1/8" - 3/4"	2 mm - 20 mm	39	50	32	44	-	54	71	98	6493S.402009
	1/8" - 3/4"	2 mm - 20 mm	40	50	32	51	69	78	93	120	6493S.402012
	1/8" - 3/4"	2 mm - 20 mm	40	50	32	51	94	103	129	157	6493S.402015

NOTE: Mechanical drive torque wrench must be set at max. 10 Nm / 7.38 ft-lbs

FPC Collets and Accessories (see pages 23-29, please order separately)

Pull stud threads are metric and available upon request

- Polygon shank acc. ISO 26623-1
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

PSC
G2.5
 20,000 min⁻¹
Design A**Design B****Design C**

Icon descriptions (see page 31)

C5

SIZE	D2 (Range)		Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	A	30	53	61	78	93	127	6496.051412
FPC20	1/8" - 3/4"	2 mm - 20 mm	B	40	53	20	31	-	78	6496.052007

C6 – Fine Balancing Holes with 6xM6 Threads

SIZE	D2 (Range)		Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	A	30	50	11	28	43	80	6477.061408
	1/8" - 9/16"	2 mm - 14 mm	A	30	50	61	78	93	130	6477.061413
	1/8" - 9/16"	2 mm - 14 mm	A	30	50	85	103	129	166	6477.061416
FPC20	1/8" - 3/4"	2 mm - 20 mm	B	40	63	18	38	-	80	6477.062008
	1/8" - 3/4"	2 mm - 20 mm	B	40	63	48	68	-	130	6477.062013
	1/8" - 3/4"	2 mm - 20 mm	B	40	63	84	104	-	166	6477.062016
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	C	63	-	-	-	-	119	6477.062511

C8 – Fine Balancing Holes with 6xM6 Threads

SIZE	D2 (Range)		Design	d ₁	d ₂	l ₁	l ₂	l ₃	l _A	EDP No.
FPC20	1/8" - 3/4"	2 mm - 20 mm	B	40	63	18	38	43	90	6477.082009
	1/8" - 3/4"	2 mm - 20 mm	B	40	63	48	68	93	140	6477.082014
FPC25	1/2" - 1 1/4"	16 mm - 32 mm	C	70	-	83	-	-	129	6477.082512

NOTE: Mechanical drive torque wrench must be set at max. 10 Nm / 7.38 ft-lbs

FPC Collets and Accessories (see pages 23-29, please order separately)

Coolant tubes and assembly wrenches available upon request

- Polygon shank acc. ISO 25623-1
- Slim line – ideal for 5-axis operation
- Concentricity $\leq 3 \mu\text{m}$ at projection length of 3 x dia.
- Internal coolant supply

PSC

Slim line

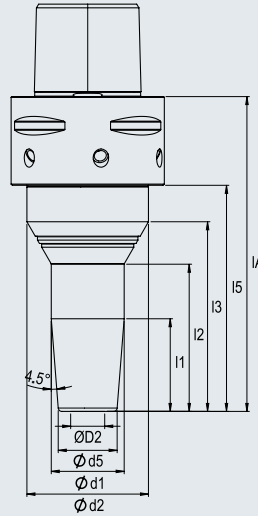
FPC

 $\leq 3 \mu\text{m}$

G2.5

20,000 min⁻¹

Icon descriptions (see page 31)



*Slim Line Design
Ideal for 5-Axis*

PSC63 SLIM LINE – Fine Balancing Holes with 6xM6 Threads

SIZE	D2 (Range)		d ₁	d ₂	d ₅	l ₁	l ₂	l ₃	l ₅	l _A	EDP No.
FPC14	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	-	56	71	108	6477S.061410
	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	61	78	93	130	6477S.061413
	1/8" - 9/16"	2 mm - 14 mm	30	50	24	38	85	103	129	166	6477S.061416
FPC20	1/8" - 3/4"	2 mm - 20 mm	39	50	32	44	-	54	71	108	6477S.062010
	1/8" - 3/4"	2 mm - 20 mm	40	50	32	51	69	78	93	130	6477S.062013
	1/8" - 3/4"	2 mm - 20 mm	40	50	32	51	94	103	129	166	6477S.062016

NOTE: Mechanical drive torque wrench must be set at max. 10 Nm / 7.38 ft-lbs

FPC Collets and Accessories (see pages 23-29, please order separately)

Coolant tubes and assembly wrenches available upon request

FMC Micro-holder, the slim collet solution

FMC slim high-precision micro collet holders were developed for holding micro and mini tools. All cylindrical shanks according to DIN 1835 and DIN 5535 up to a shank diameter of 6 mm can be clamped.

Holders are rotationally symmetrical with excellent concentricity and can be used at very high rotational speeds.

Longer tool life

Clamping system has excellent damping properties for reducing vibrations.

High concentricity

Specially-coated collet guarantees a concentricity $\leq 3\mu\text{m}$ at projection length of $3 \times D_1$.

Optimum coolant supply

Coolant-lubricant can be supplied either through slots, collet, or coolant channel of the tool.

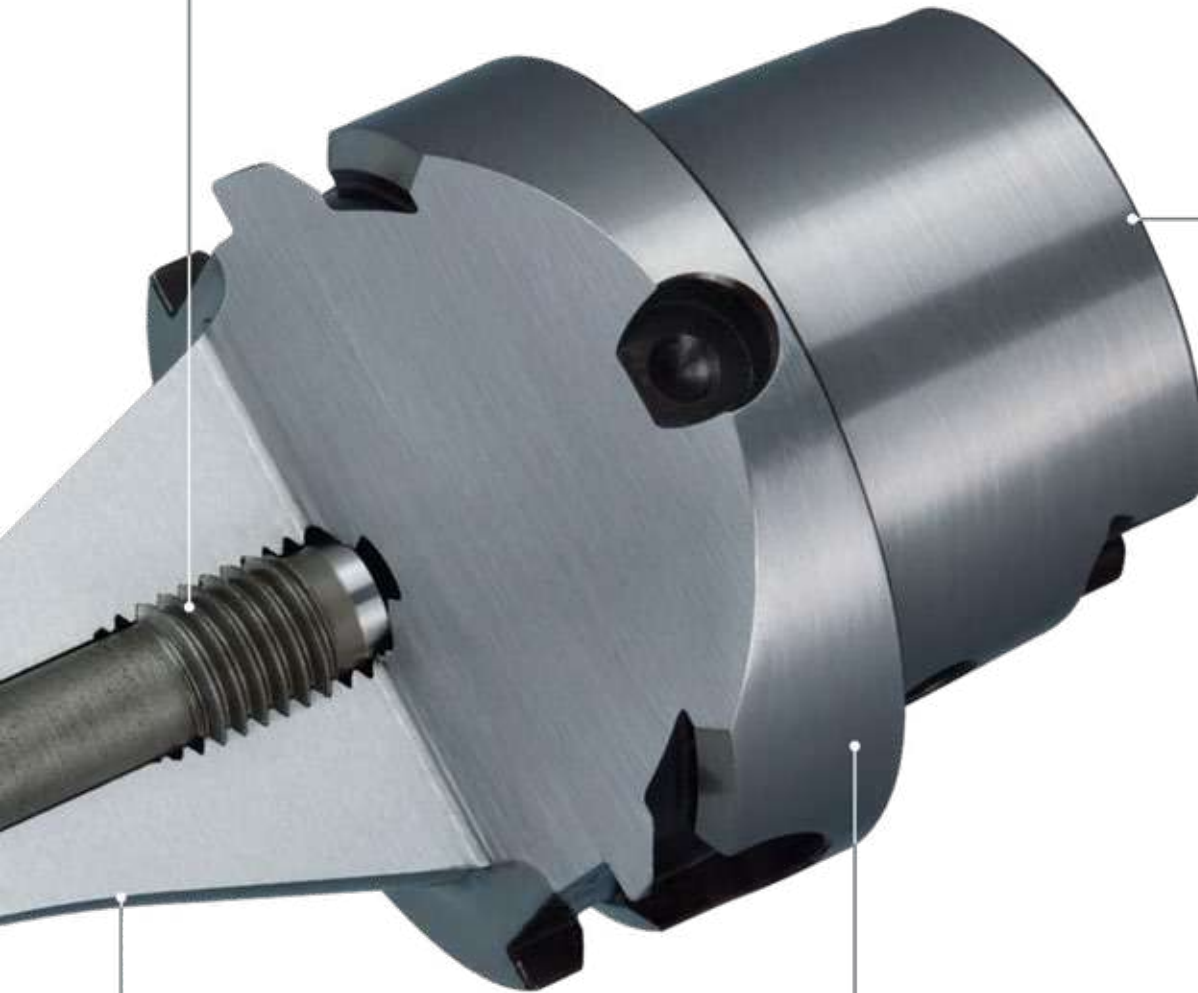


Long service life

System is maintenance-free, sealed against coolant and contamination.

Quick tool change

Tool change takes place from behind through the tool holder via hexagon wrench.

**Slim contour**

Improves accessibility for deep and narrow cavities. Ideal for difficult-to-reach, deep-set machining operations.

High balance quality

Holders are balanced to $G = 2.5$ at 20,000 rpm. Smaller holder sizes are balanced to < 1 gmm.

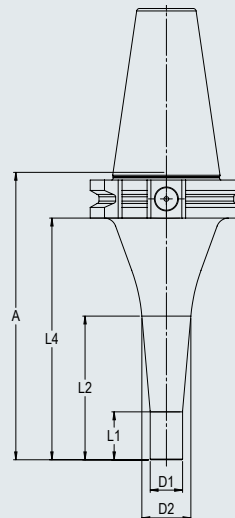
- ASME B5.50-2009
- Slim design for hard to access areas
- High gripping torque and accuracy
- Special coated collets
- Operation from behind with included hex-key
- Internal coolant supply

CAT

Micro



Icon descriptions (see page 31)



CAT MICRO

SIZE	Tool Shank Diameter Range		D ₁	D ₂	L ₁	L ₂	L ₄	A	EDP No.
CAT40	1/8"-1/4"	1 mm - 6 mm	13.5	16.6	20	38	71	90	6394.400609
	1/8"-1/4"	1 mm - 6 mm	13.5	20.5	20	60	101	120	6394.400612

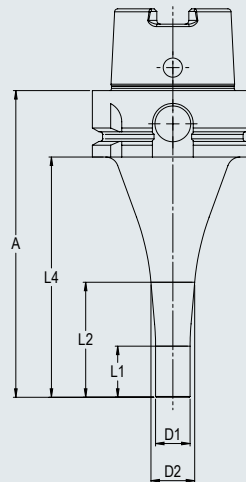
- DIN 69893
- Slim design for hard to access areas
- High gripping torque and accuracy
- Special coated collets
- Operation from behind with included hex-key
- Internal coolant supply

HSK

Micro



Icon descriptions (see page 31)



HSK MICRO

SIZE	Tool Shank Diameter Range		D ₁	D ₂	L ₁	L ₂	L ₄	A	EDP No.
HSK 40-A	1/8"-1/4"	1 mm - 6 mm	13.5	16	20	35	55	75	6392.400607
HSK 50-A	1/8"-1/4"	1 mm - 6 mm	13.5	16	20	33.5	59	85	6392.500608
	1/8"-1/4"	1 mm - 6 mm	13.5	18	20	45	94	120	6392.500612
HSK 63-A	1/8"-1/4"	1 mm - 6 mm	13.5	15	20	30	64	90	6392.630609
	1/8"-1/4"	1 mm - 6 mm	13.5	17	20	45	94	120	6392.630612
HSK 40-E	1/8"-1/4"	1 mm - 6 mm	13.5	22	20	70	134	160	6392.630616
	1/8"-1/4"	1 mm - 6 mm	13.5	16	20	35	55	75	6399.400607
HSK 50-E	1/8"-1/4"	1 mm - 6 mm	13.5	17	20	40	59	85	6399.500608
	1/8"-1/4"	1 mm - 6 mm	13.5	18	20	45	94	120	6399.500612

NOTE: Mechanical drive torque wrench must be set at 3.0 - 4.4 Nm

FMC Collets and Accessories (see pages 22 and 26, please order separately)

Coolant tubes and assembly wrenches available upon request

- ISO 7388-1
- Slim design for hard to access areas
- High gripping torque and accuracy
- Special coated collets
- Operation from behind with included hex-key
- Internal coolant supply

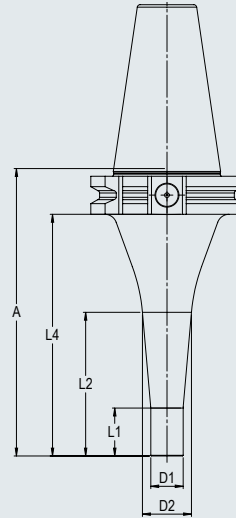
SK (ISO)

Micro


 $\leq 3 \mu\text{m}$

G2.5
20,000 min⁻¹

Icon descriptions (see page 31)



SK MICRO

SIZE	Tool Shank Diameter Range		D ₁	D ₂	L ₁	L ₂	L ₄	A	EDP No.
SK30	1/8"-1/4"	1 mm - 6 mm	13.5	16	20	32	56	75	6391.300607
	1/8"-1/4"	1 mm - 6 mm	13.5	17	20	38	71	90	6391.400609
SK40	1/8"-1/4"	1 mm - 6 mm	13.5	21	20	60	101	120	6391.400612
	1/8"-1/4"	1 mm - 6 mm	13.5	23	20	75	141	160	6391.400616

- ISO 7388-2
- Slim design for hard to access areas
- High gripping torque and accuracy
- Special coated collets
- Operation from behind with included hex-key
- Internal coolant supply

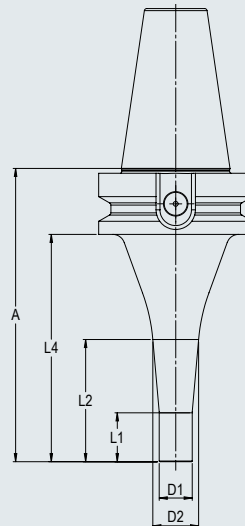
BT

Micro


 $\leq 3 \mu\text{m}$

G2.5
20,000 min⁻¹

Icon descriptions (see page 31)



BT MICRO

SIZE	Tool Shank Diameter Range		D ₁	D ₂	L ₁	L ₂	L ₄	A	EDP No.
BT30	1/8"-1/4"	1 mm - 6 mm	13.5	15	20	30	53	75	6393.300607
	1/8"-1/4"	1 mm - 6 mm	13.5	15	20	30	63	90	6393.400609
BT40	1/8"-1/4"	1 mm - 6 mm	13.5	19	20	50	93	120	6393.400612
	1/8"-1/4"	1 mm - 6 mm	13.5	22	20	70	133	160	6393.400616

NOTE: Mechanical drive torque wrench must be set at 3.0 - 4.4 Nm

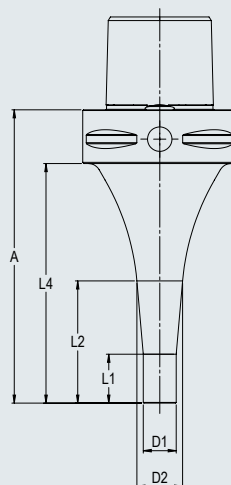
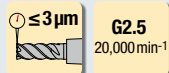
FMC Collets and Accessories (see pages 22 and 26, please order separately)

Coolant tubes and assembly wrenches available upon request

- ISO 26623-1
- Slim design for hard to access areas
- High gripping torque and accuracy
- Special coated collets
- Operation from behind with included hex-key
- Internal coolant supply

PSC

Micro



Icon descriptions (see page 31)

PSC MICRO

SIZE	Tool Shank Diameter Range	D ₁	D ₂	L ₁	L ₂	L ₄	A	EDP No.
PSC40	1/8"-1/4" 1 mm - 6 mm	13.5	16	20	35	55	75	6396.400607
PSC63	1/8"-1/4" 1 mm - 6 mm	13.5	15	20	30	68	90	6396.630609
	1/8"-1/4" 1 mm - 6 mm	13.5	19	20	50	98	120	6396.630612

NOTE: Mechanical drive torque wrench must be set at 3.0 - 4.4 Nm

FMC Collets and Accessories (see pages 22 and 26, please order separately)

Coolant tubes and assembly wrenches available upon request

FMC Collets for Micro Chucks

- Standard version for coolant supply via slots in the collet
- Sealed version for tools with internal coolant supply

FMC



Standard

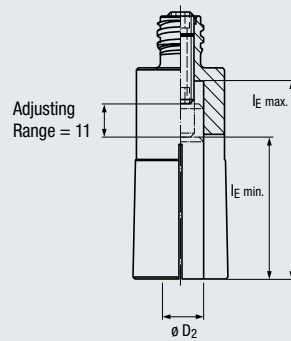
Sealed

$\varnothing D_2$		EDP No.	EDP No.
[inch]	1/8"	6648.060125	6649.060125
	3/16"	6648.060188	6649.060188
	1/4"	6648.060250	6649.060250
[mm]	1	6648.0601	6649.0601
	2	6648.0602	6649.0602
	3	6648.0603	6649.0603
	4	6648.0604	6649.0604
	5	6648.0605	6649.0605
	6	6648.0606	6649.0606

- Length stop adjustable from both sides
- Standard version for coolant supply via slots in collet
- Sealed version for tools with internal coolant supply

FPC

For accessories (see pages 27-29)



INCH					Standard	Sealed
SIZE	D ₂	l _E min	l _E max	Adjusting range	EDP No.	EDP No.
FPC14	1/8"	17	48	11	6638.140125	6639.140125
	3/16"	17	48	11	6638.140188	6639.140188
	1/4"	25	48	11	6638.140250	6639.140250
	5/16"	25	48	11	6638.140313	6639.140313
	3/8"	29	48	11	6638.140375	6639.140375
	7/16"	34	48	11	6638.140438	6639.140438
	1/2"	34	48	11	6638.140500	6639.140500
	9/16"	34	48	11	6638.140563	6639.140563
FPC20	1/8"	17	48	11	6638.200125	6639.200125
	3/16"	17	48	11	6638.200188	6639.200188
	1/4"	25	48	11	6638.200250	6639.200250
	5/16"	25	48	11	6638.200313	6639.200313
	3/8"	29	48	11	6638.200375	6639.200375
	7/16"	34	48	11	6638.200438	6639.200438
	1/2"	34	48	11	6638.200500	6639.200500
	9/16"	34	48	11	6638.200563	6639.200563
	5/8"	37	48	11	6638.200625	6639.200625
	11/16"	37	48	11	6638.200688	6639.200688
	3/4"	39	48	11	6638.200750	6639.200750
FPC25	5/8"	37	60	11	6638.250625	6639.250625
	3/4"	39	60	11	6638.250750	6639.250750
	1"	45	60	11	6638.251000	6639.251000
	1 1/4"	48	60	11	6638.251250	6639.251250
METRIC						
FPC14	2	17	48	11	6638.1402	6639.1402
	3	17	48	11	6638.1403	6639.1403
	4	17	48	11	6638.1404	6639.1404
	5	17	48	11	6638.1405	6639.1405
	6	25	48	11	6638.1406	6639.1406
	7	25	48	11	6638.1407	6639.1407
	8	25	48	11	6638.1408	6639.1408
	9	29	48	11	6638.1409	6639.1409
	10	29	48	11	6638.1410	6639.1410
	11	34	48	11	6638.1411	6639.1411
	12	34	48	11	6638.1412	6639.1412
	14	34	48	11	6638.1414	6639.1414
FPC20	2	17	48	11	6638.2002	6639.2002
	3	17	48	11	6638.2003	6639.2003
	4	17	48	11	6638.2004	6639.2004
	5	17	48	11	6638.2005	6639.2005
	6	25	48	11	6638.2006	6639.2006
	8	25	48	11	6638.2008	6639.2008
	10	29	48	11	6638.2010	6639.2010
	11	34	48	11	6638.2011	6639.2011
	12	34	48	11	6638.2012	6639.2012
	14	34	48	11	6638.2014	6639.2014
	15	37	48	11	6638.2015	6639.2015
	16	37	48	11	6638.2016	6639.2016
	18	37	48	11	6638.2018	6639.2018
	20	39	48	11	6638.2020	6639.2020
FPC25	16	37	60	11	6638.2516	6639.2516
	18	37	60	11	6638.2518	6639.2518
	20	39	60	11	6638.2520	6639.2520
	22	39	60	11	6638.2522	6639.2522
	25	45	60	11	6638.2525	6639.2525
	32	48	60	11	6638.2532	6639.2532

Minimum quantity lubrication (1-channel or 2-channel MQL systems) possible by exchanging the length stop, available on request

l_E min. = Minimum clamping length of the tool with length stop
l_E max. = Maximum clamping length of the tool without length stop

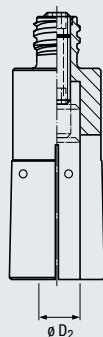
NOTE: FPC Collets torque value 10 Nm

FPC Pin-Lock Collets

- Use with straight shank standard tools according to DIN 6535 HB or DIN 1835 B (with Weldon flat)
- Available for FPC20 and FPC25 Chucks
- Standard version for coolant supply via slots in the collet
- Sealed version for tools with internal coolant supply
- Includes 3 pins

FPC

For accessories (see pages 27-29)



INCH		Standard **	Sealed
SIZE	D ₂	EDP No.	EDP No.
FPC20	1/4"	6637.200250	6633.200250
	5/16"	6637.200313	6633.200313
	3/8"	6637.200375	6633.200375
	7/16"	6637.200438	6633.200438
	1/2"	6637.200500	6633.200500
	5/8"	6637.200625	6633.200625
FPC25	1/2"	6637.250500	6633.250500
	5/8"	6637.250625	6633.250625
	3/4"	6637.250750	6633.250750
	7/8"	6637.250875	6633.250875
	1"	6637.251000	6633.251000
METRIC			
SIZE	D ₂	EDP No.	EDP No.
FPC20	6	6637.2006	6633.2006
	8	6637.2008	6633.2008
	10	6637.2010	6633.2010
	12	6637.2012	6633.2012
	14	6637.2014	6633.2014
	16	6637.2016	6633.2016
	18	6637.2018	6633.2018
FPC25	16	6637.2516	6633.2516
	18	6637.2518	6633.2518
	20	6637.2520	6633.2520
	22	6637.2522	6633.2522
	25	6637.2525	6633.2525

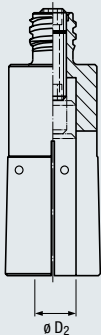
NOTE: FPC Collets torque value 10 Nm

** While Supplies Last.
Items will be replaced with
EDP No. 6631.XXXXXX

- Collets 2.0 have an improved coolant delivery design
- Additional channels for peripheral cooling directly on the tool shank
- Up to 60% higher metal removal rates and tool life
- Includes 3 pins and assembly tool
- Fine adjustable length stop
- Maintenance free

FPC

For accessories (see pages 27-29)





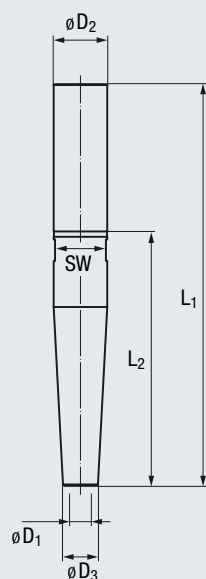
INCH		2.0	
SIZE	D ₂	EDP No.	
FPC20	1/4"	6631.200250	
	5/16"	6631.200313	
	3/8"	6631.200375	
	7/16"	6631.200438	
	1/2"	6631.200500	
	5/8"	6631.200625	
FPC25	1/2"	6631.250500	
	5/8"	6631.250625	
	3/4"	6631.250750	
	7/8"	6631.250875	
	1"	6631.251000	
METRIC			
SIZE	D ₂	EDP No.	
FPC20	6	6631.2006	
	8	6631.2008	
	10	6631.2010	
	12	6631.2012	
	14	6631.2014	
	16	6631.2016	
FPC25	16	6631.2516	
	18	6631.2518	
	20	6631.2520	
	22	6631.2522	
	25	6631.2525	



Pin-Lock Collets 2.0
with additional channels for peripheral cooling directly on the tool shank providing up to 60% higher Metal-Remove-Rate (MRR) and tool life.

FMC Micro Collet Extensions

- Straight shank, tolerance h6
- With wrench flats
- Concentricity < 8 µm
- Internal coolant supply



L ₁	D ₁	D ₃	L ₂	D ₂	SW	EDP No.
100 mm	1 mm - 6 mm	13	45	14	13	6395.14100
150 mm	1 mm - 6 mm	13	95	14	13	6395.14150
100 mm	1 mm - 6 mm	13	48	20	13	6395.20100
150 mm	1 mm - 6 mm	13	95	20	19	6395.20150

Hexagon wrench included with collet extensions

Hexagon Torque Wrench for FMC Collet Extensions

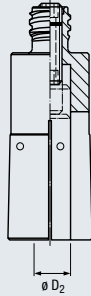


	Blade Length	Torque	EDP No.
Standard Torque Wrench for Extension and Micro Holder	113 mm	3.0 - 5.4 Nm	6665.021
Long Torque Wrench*	160 mm	3.0 - 5.4 Nm	6665.121

* Recommended for BT40 (6393.400616) and SK40 (6391.499616) Micro chucks

FPC Accessories

Pin-Lock Collet Assembly Tool



See page 30-31 for assembly tool use instructions.



SIZE	Pin-Lock Collet Diameter D ₂	Tool rod dia.	Width across flats	EDP No.
FPC20	6 mm - 16 mm	2 mm	SW4 (4 mm)	6665.055
	18 mm	1 mm	SW4 (4 mm)	6665.056
FPC25	16 mm - 25 mm	2 mm	SW5 (5 mm)	6665.057

Pin-Lock Collet Spare Pins



SIZE	Pin-Lock Collet Diameter D ₂	Diameter x Length (mm)	EDP No.
FPC20	6 mm - 14 mm	3 x 14	6665.041
	16 mm	3 x 12	6665.040
	18 mm	2 x 12	6665.044
FPC25	16 mm - 20 mm	4 x 26	6665.043
	22 mm - 25 mm	4 x 29	6665.042

Hexagon Torque Wrench

with break-away signal



Width across flats	Torque	EDP No.
SW4 (4 mm)	10 Nm	6665.011

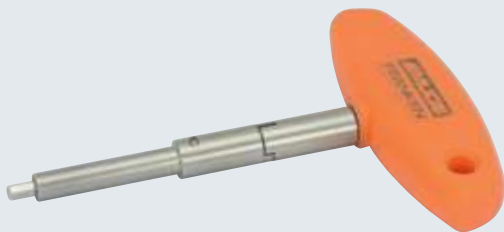
Spare Bit with Guidance Tube for Hexagon Torque Wrench



Width across flats	EDP No.
SW4 (4 mm)	6665.018

Hexagon Torque Wrench

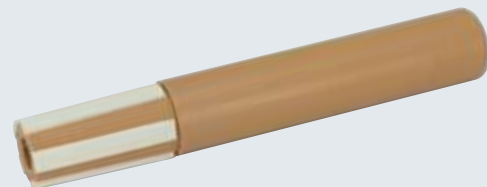
with marking for torque applied



Width across flats	Torque	EDP No.
SW4 (4 mm)	10 Nm	6665.014

Taper Cleaners

For cleaning the inside cone of FPC Collet Holders



For size	EDP No.
FPC 14	6665.030
FPC 20	6665.031
FPC 25	6665.032

FPC Accessories

Balancing Screw Set

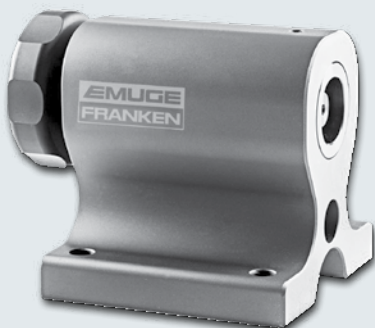


SIZE	# of screws	EDP No.
M6 T x 15 (Set with case)	180	6665.M6

BALANCING SCREWS

SIZE	# of screws	EDP No.
M6 x 4	20	6665.M604
M6 x 4.5	20	6665.M6045
M6 x 5	20	6665.M605
M6 x 5.25	20	6665.M6052
M6 x 6	20	6665.M606
M6 x 6.5	20	6665.M6065
M6 x 7	20	6665.M607
M6 x 7.2	20	6665.M6072
M6 x 8	20	6665.M608

FPC Mounting System - Base



Description	EDP No.
Base Unit	6915.01

Storage Tray for FPC Collets



SIZE	Dimensions (mm)	for # of collets	EDP No.
FPC14	345 x 250 x 30	24	6665.051
FPC20	345 x 250 x 30	21	6665.052
FPC25	345 x 250 x 30	10	6665.053

FPC Mounting System - Adaptors



Description	EDP No.
Adapter SK30 & BT30	6915.02
Adapter SK40, BT40 & CAT40	6915.03
Adapter SK50, BT50 & CAT50	6915.04
Adapter HSK 50	6915.05
Adapter HSK 63	6915.06
Adapter HSK 80	6915.07
Adapter HSK 100	6915.08
Adapter PSC50	6915.09
Adapter PSC63	6915.10
Adapter PSC80	6915.11

FPC Accessories

Torque Limiter for use with power tool with 4mm hex bit.
The mounting system locks the toolholder during operation.

Contact EMUGE-FRANKEN for information about
recommended cordless drill model availability.



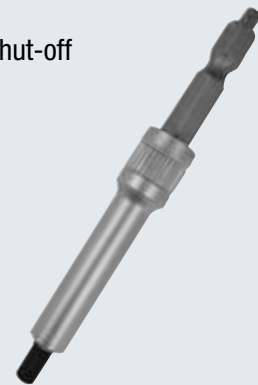
Torque	EDP No.
10 Nm	6665.027

Cordless Screwdriver Bosch Exact Ion

Screwdriver is ideal for quick and safer clamping of all FPC Chucks. Fixed speed levels and automatic shutdown when the target torque of 10 Nm is reached. Supplied with a matching bit. Associated Bosch battery is not included in the scope of delivery and must be ordered separately.

**Hex bit**

for cordless shut-off
screwdriver
EXACT ION



Description	EDP No.
Cordless Screwdriver Bosch Exact Ion	6665.022
Battery pack for Bosch Exact Ion	6665.023
Battery Charger for Accu pack 220V	6665.024
Battery Charger for Accu pack 110V	6665.124

Width across flats	EDP No.
SW4 (4mm)	6665.026

FPC Clamping Device

Enables fast and accurate mechanical clamping of precision collet holders FPC to preset nominal torque of 10 Nm using Bosch battery-powered shut-off screwdriver EXACT ION. Torque produced on battery powered shut-off screwdriver is completely absorbed by FPC clamping device. Many clamping operations can be carried out quickly and energy-efficiently. Battery-powered EXACT ION Screwdriver and Interchangeable Adaptors are not included in the delivery and must be ordered separately.

**Interchangeable Adaptor for FPC Clamping Device**

Description	EDP No.
Clamping device	6665.070

Shank Size	EDP No.
ISO 7388-1 SK40, CAT40	6665.071
ISO 7388-2 BT40	6665.072
DIN 69893 HSK63	6665.073
ISO 26623-1 PSC63	6665.074

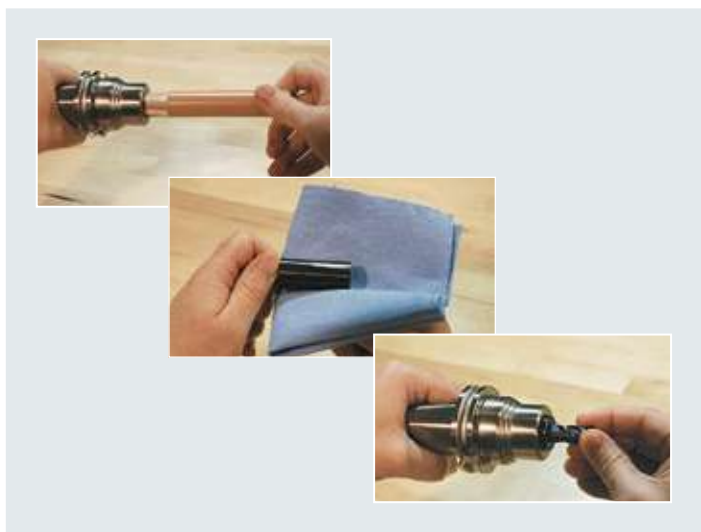
Other sizes available upon request

FPC Chuck Operation

1. Inserting the collet:

Clean the inner taper of the FPC (for cleaning the inner cone we recommend our special taper cleaners (see page 27)).

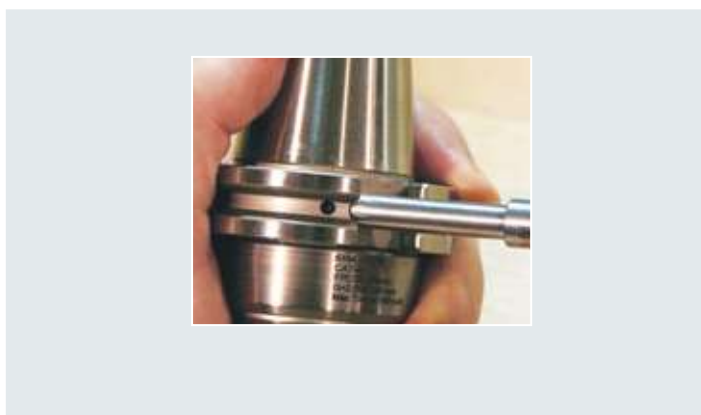
Manually screw the clean collet with the tool into the chuck until the collet connects with the taper. In order to achieve maximum clamping forces we recommend to degrease tool shank, inner and outer collet cone, as well as the inner cone of the FPC.



2. Clamping:

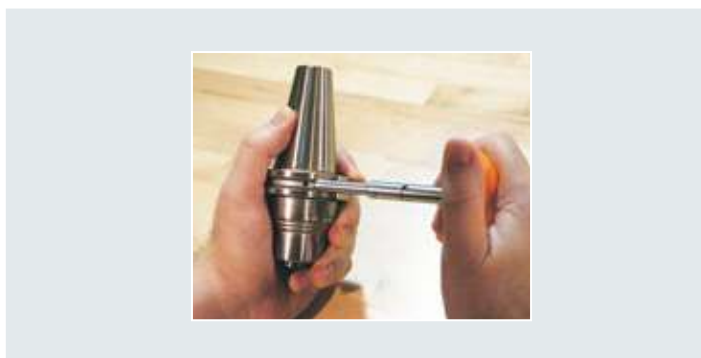
Clamping procedure starts by engaging the screw on the side of the FPC and rotating the hex key clockwise.

Caution: Insert the hex key as far as possible. Only use hex key with torque measurement. Max 10 Nm / 7.38 ft-lbs for torque



3. Loosening:

Loosen the collet by inserting the hex key and turning it counter clockwise. Full torque will be applied. Turn until the collet can be unscrewed manually.



4. Length stop:

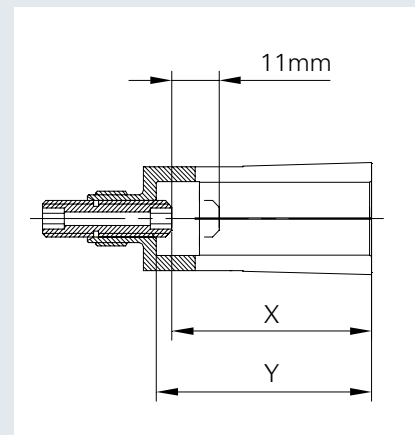
A length stop screw is located in the collet and can be adjusted with the hex key.



FPC Chuck Operation (continued)

5. Insertion depth of tool:

FPC type	Clamping Diameter/		X mm	Y mm
	mm	inch		
FPC14/FPC20	2 - 5	1/8"-3/16"	28	48
FPC14/FPC20	6	1/4"	36	
FPC14/FPC20	7-8.5	5/16"	36	
FPC14/FPC20	9	3/8"	40	
FPC14/FPC20	10		40	
FPC14/FPC20	11-14	7/16"-9/16"	45	
FPC20	15-18	5/8"-11/16"	48	
FPC20	20	3/4"	50	60
FPC25	16-18		48	
FPC25	20-22		50	
FPC25	25		56	
FPC25	32	1 1/4"	60	



FPC Pin-Lock Operation

1. Positioning tool: Remove the length setting screw, then position the Weldon-clamping surface on the side of the bore. Now insert the tool into the collet until the Weldon-clamping surface lies in the range of the bore.

2. Positioning pin: The locking-pin has to be inserted with the help of the pin punch into the bore of the collet up to the block. Caution: The pin must not stick out of the collet.

3. Free from backlash: With the assembly tool, the length stop screw must be set forward, pushing the Weldon flat of the cutting tool against the locking pin. Caution: Mounting without axial pressure can result in tool pullout. The collet with the secured tool can now be placed into the FPC chuck (see FPC operation manual).

4. Removing the tool: The length setting screw has to be unscrewed. The pin can be pressed out of the bore with the smallest diameter in the direction of the large diameter. Then the tool can be removed.



Icon Descriptions



For use with FPC Collets only



≤ 3µm (micron) runout at 3x diameter length



Balanced to G2.5, 20,000 RPM



Taper quality AT3

Assessment of Tool Holder Performance in Roughing

The dynamic vibrational behavior of different clamping mechanisms was evaluated using tool holders of similar dimensions. Analysis of the sensor data and optical analysis of the manufactured surface reveal a significant influence of the particular clamping mechanism, superimposed by certain geometrical variations of the tool holders.

Findings:

- Chatter frequencies occurring during milling tests seem independent of the clamping mechanism and the particular tool holder, and are caused by the tool or machine tool components.
- Chatter intensity and spindle speeds, at which chatter occurs, are influenced by the tool holders.
- The occurrence of chatter vibrations correlates with a significant drop in the surface quality of the workpiece.
- High resonance frequencies of the tool holder excited by chatter and low frequency waviness observed on the machine surface are related.

Evaluated tool holder systems:



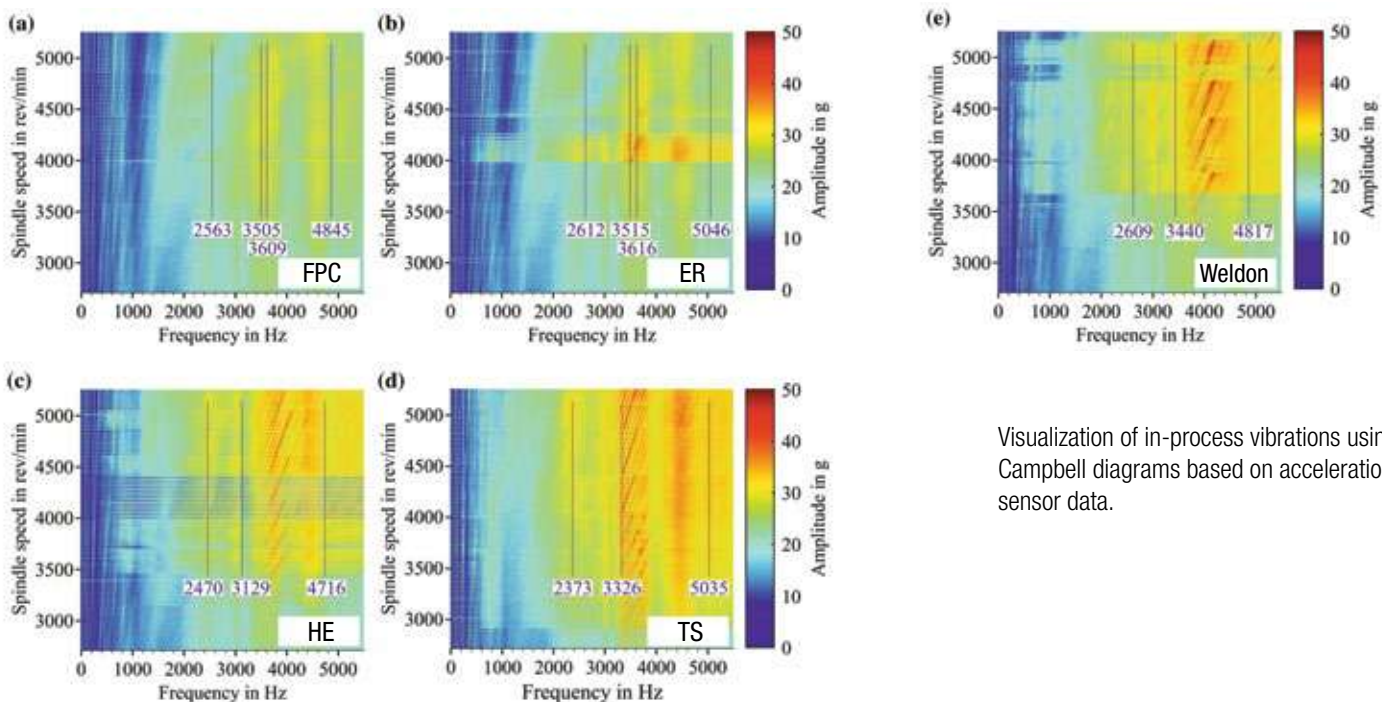
Test setup:

Machine: MC12 by Gebr. Heller
Tool: torus cutter, D=12, number of teeth=4
Material: Steel, 42CrMo4 (1.7225)

Cutting Parameters:

$n = 3979 \text{ rev/min}$, $f_z = 0.04 \text{ mm/rev/tooth}$, $a_e = 7 \text{ mm}$, $a_p = 18 \text{ mm}$

FPC had the best results in comparison to the other tool holders:



Visualization of in-process vibrations using Campbell diagrams based on acceleration sensor data.

EMUGE-FRANKEN FPC Chucks provide the longest tool life and highest safety compared to conventional technologies.

EMUGE-FRANKEN FPC Chucks – unbeatable performance, exceptionally long tool life.



Weldon
One-sided wear



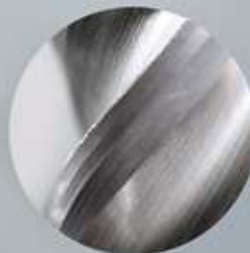
Hydraulic
Large nicks



Shrink Fit
Micro nicks



EMUGE-FRANKEN FPC Chuck
No nicks and minimal rounding



Test using 4-fluted end mill with identical material, machining speed and other parameters.

EMUGE-FRANKEN FPC Chucks – a Safe Bet.

Strong holding force via collet and taper assembly.



Weldon

Safe clamping but minimal vibration dampening and poor runout.



Hydraulic
Possible pull-out

Soft clamping allows for higher deflection at high feed rates. No pull-out protection.



Shrink Fit
Possible pull-out

Clamping force dependent on tool shank tolerance. Limited vibration dampening.



EMUGE-FRANKEN FPC Chuck

Strong clamping force via collet and taper assembly and Pin-Lock System **provides guaranteed holding power and pull-out protection.**



EMUGE Softsynchro® Tap Holders

Increase tool life & thread surface quality with our unique design featuring **patented constructional separation of the transmission of torque and axial force.**



Learn more at:
emuge.com



EMUGE-FRANKEN USA
1800 Century Drive, West Boylston, MA 01583

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