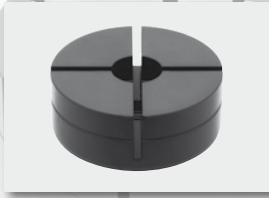


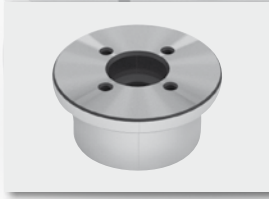
FORM HOLDING CLAMPS



FORM HOLDING CLAMPS
pag. 8.4



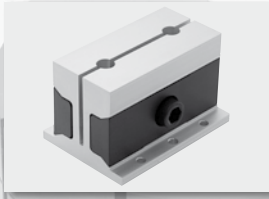
JAWS
pag. 8.6



MOUNTING-ON-LATHE ADAPTERS
pag. 8.7



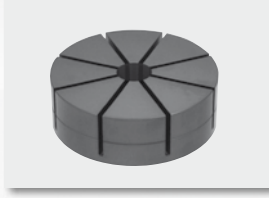
FORM HOLDING CLAMPS
Wedge Style/Round
pag. 8.8



FORM HOLDING CLAMPS
Wedge Style/Square
pag. 8.10



FORM HOLDING CLAMPS
pag. 8.12



JAWS
for external
Form Holding
pag. 8.14



JAWS
for internal
Form Holding
pag. 8.16



TAPERED SCREWS
for internal
Form Holding
pag. 8.16



FORM HOLDING CLAMPS

For holding on external / internal form!

Form Holding Clamps that have a machinable jaw to hold irregular-shaped workpieces.



FORM HOLDING CLAMPS

Two optional jaws clamping workpieces both on its external form and internal form.

For external form holding

For internal form holding



1 Prepare the jaw

2 Machine the jaw

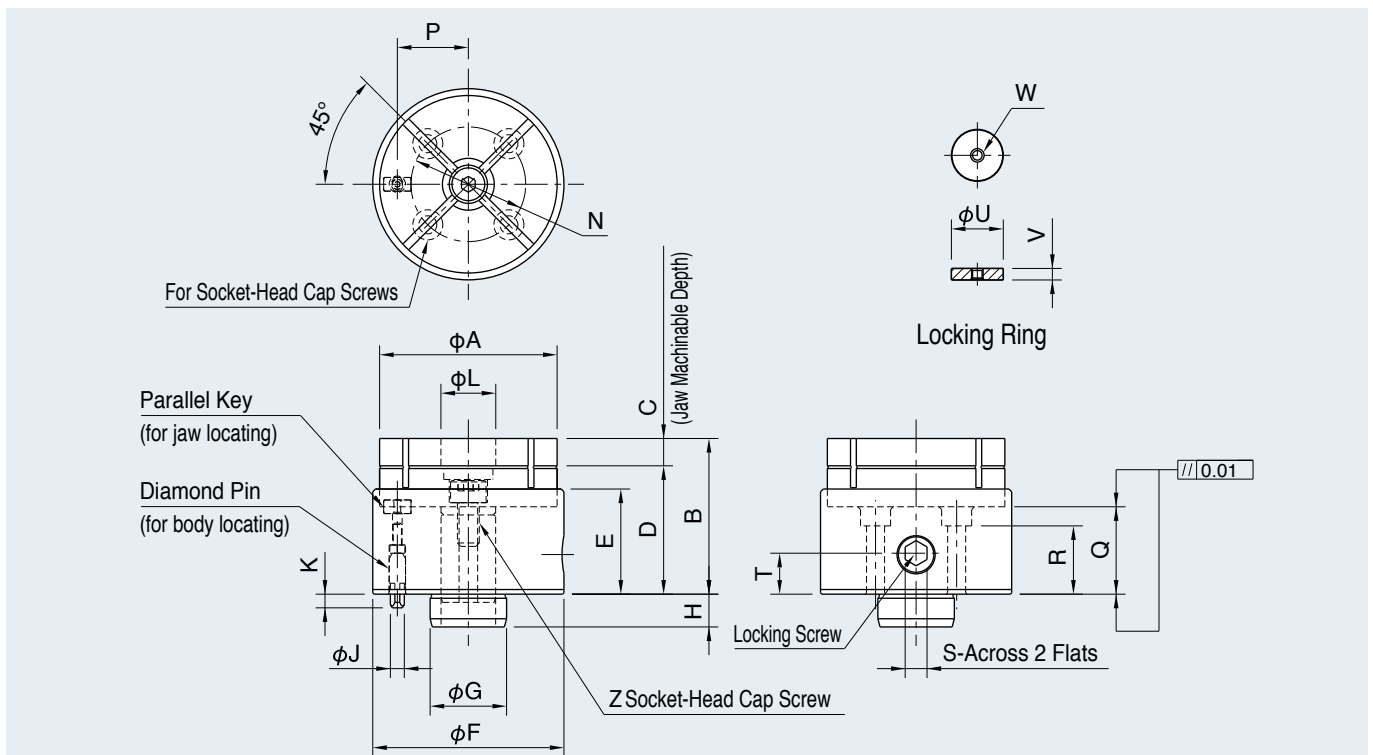
3 Mount a workpiece

4 Tighten the cam cylinder





Body	Jaw
Steel (S45C) Black oxide finish	Aluminum (A7075) Blue
Shaft / Locking Screw	Housing / Locking Ring
Steel (SCM435) Black oxide finish Quenched and tempered	Steel (S45C) Black oxide finish



Part Number	A	B	C	D	E	F	G (G6)	H	J (H6)	K	L	M	N	P ±0.02	Q ±0.01	R
51992212	65	57	10	47	39	70	28	12	6	5	19	M6	42	26	32	25
51992213	90	72	15	57	46	95	42	14	8	7	23	M8	60	36	38	28

Part Number	S	T	U	V	W	Z	Clamping Force (G6)	Allowable Screw Torque (N.m)	Weight (kg)
51992212	8	15	18	4	M4x0.7	M 8x1.25 - 15L	4,000	60	1.1
51992213	10	17	22	6	M5x0.8	M 10x1.5 - 20L	6,000	100	2.6

Technical Data:

- Part locating repeatability: ±0.03
- Jaw locating repeatability: ±0.02

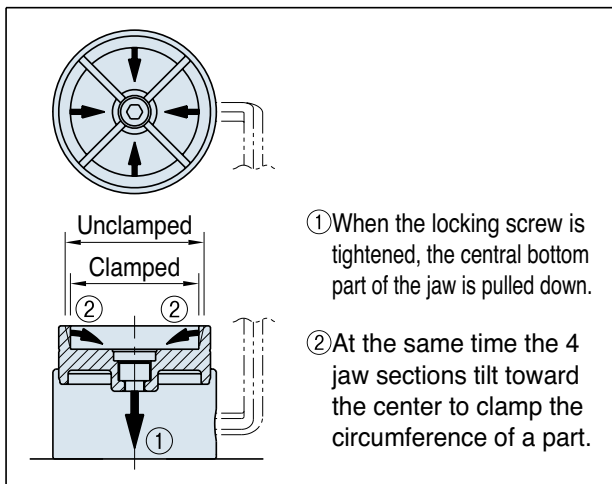
Included:

- 1 of locking ring
- 1 of diamond pin
- 1 of socket-head cap screw

Notes:

- Never tighten the locking screw without a part mounted, to avoid damage and deformation.
- Do not machine the jaw deeper than allowed.

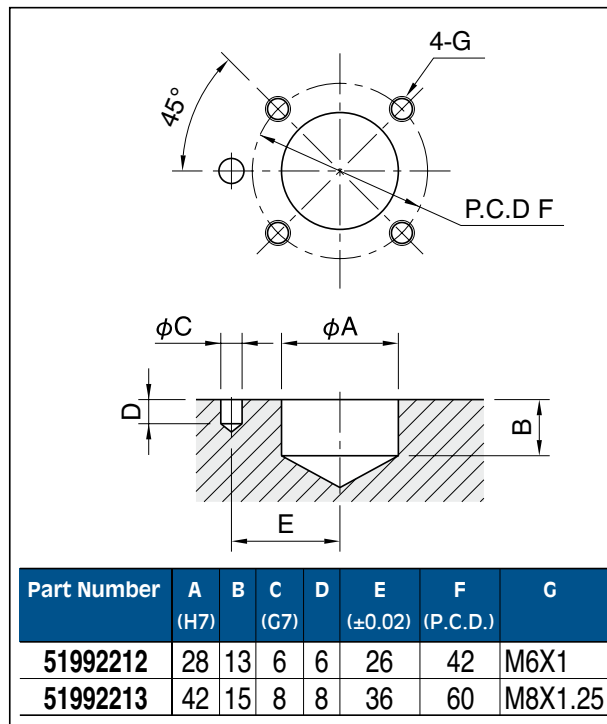
Features:



- ① When the locking screw is tightened, the central bottom part of the jaw is pulled down.
- ② At the same time the 4 jaw sections tilt toward the center to clamp the circumference of a part.

- The diaphragm clamping mechanism allows securely clamping a part with 4 jaw sections.
- Different irregularly-shaped parts can be clamped.
- 0.15mm clamping stroke of each jaw section is perfect for clamping of lost-wax parts, die-cast parts, extruded parts, solid-drawn parts, prefinished parts, etc.

Hole Preparation



Part Number	A (H7)	B	C (G7)	D	E (±0.02)	F (P.C.D.)	G
51992212	28	13	6	6	26	42	M6X1
51992213	42	15	8	8	36	60	M8X1.25

How To Use

① Body Mounting

Socket-Head Cap Screws
Diamond Pin
Body

Insert an included diamond pin into the body for locating, and then secure the body to the fixture plate with 4 socket-head cap screws.

② Jaw Setting

Socket-Head Cap Screw
Jaw
Parallel Key
Locking Screw

Engage the keyway on the bottom of the jaw with the parallel key on the top of the body, and then secure the jaw with an included cap screw.
Note : At jaw installation, ensure the locking screw is fully loosened by turning counterclockwise until it stops.

③ Jaw Machining

(Bolt)
Locking Ring
Socket-Head Cap Screw

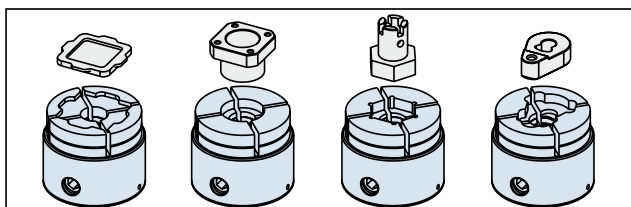
Note : Locate the locking ring above the cap screw's socket.

(1) Set the locking ring in the jaw.
(using a bolt facilitates setting)

④ Part Setting

Locking Ring
Part

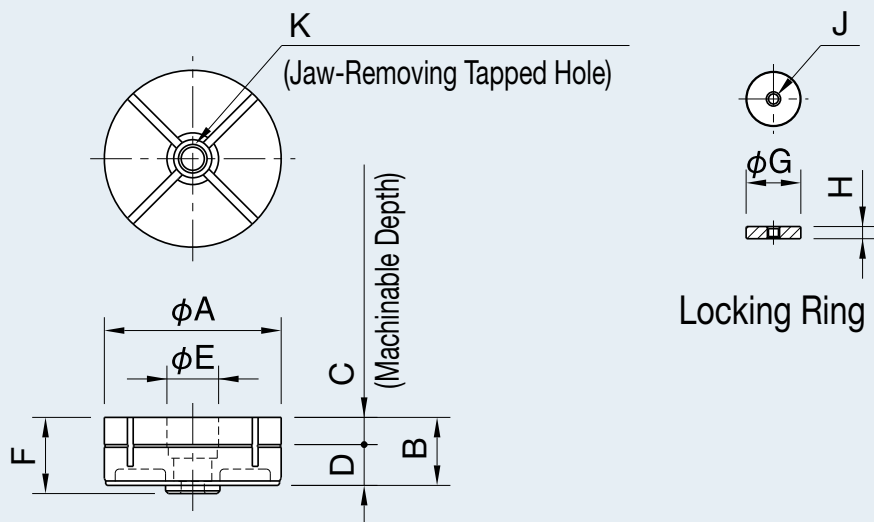
- After machining loosen the locking screw to take out the locking ring.
- Mount a part and then tighten the locking screw for clamping.



- Tightening the locking screw on the side of the body allows holding a part on its circumference.
- Machinable jaws allow clamping parts of various shapes.
- Ideal way to hold parts for machining on small-size machining centers, tapping centers, small-size 5-axis machines, CNC rotary tables, etc.

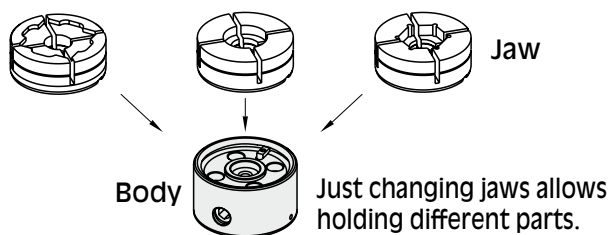


Jaw	Locking Ring
Aluminum (A7075) Blue	Steel (S45C) Black oxide finish



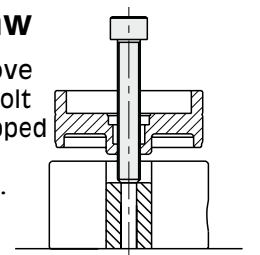
Part Number	A	B	C	D	E	F	G	H	J	K	Weight (g)	Form holding clamps
51992214	65	25	10	15	19	28	18	4	M4x0.7	M10x1.5 (prepared hole ø 8.5)	170	51992212
51992215	90	34	15	19	23	39	22	6	M5x0.8	M12x1.75 (prepared hole ø 10.2)	470	51992213

Feature:



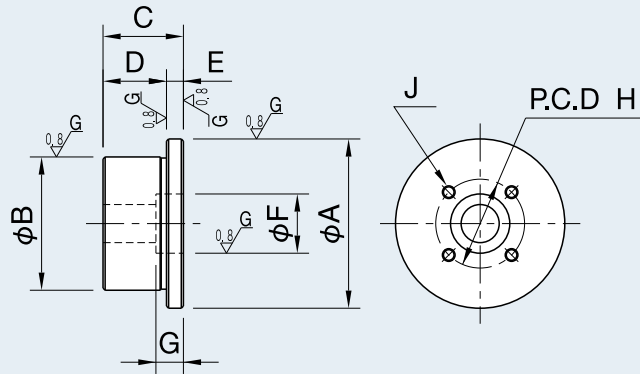
How To Remove Jaw

When it is hard to remove the jaw by hand, screw a bolt into the jaw-removing tapped hole to push it against the body, for easier removal.





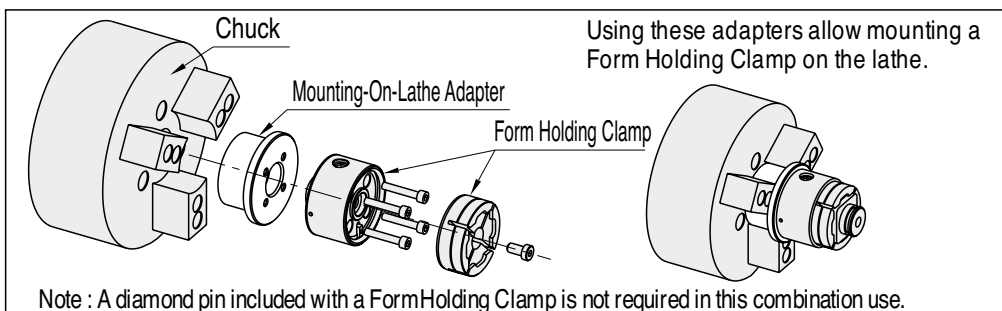
Body
Steel (SCM415)
Black oxide finish
Carburized-hardened



Part Number	A	B ±0,01	C	D	E ±0,01	F H7	G	H	J	Weight (g)
51992216	80	63	38	30	8	28	13	42	M6x1 12 deep	910
51992217	100	80	43	35	8	42	15	60	M8x1.25 16 deep	1.600

Form holding clamps
51992212
51992213

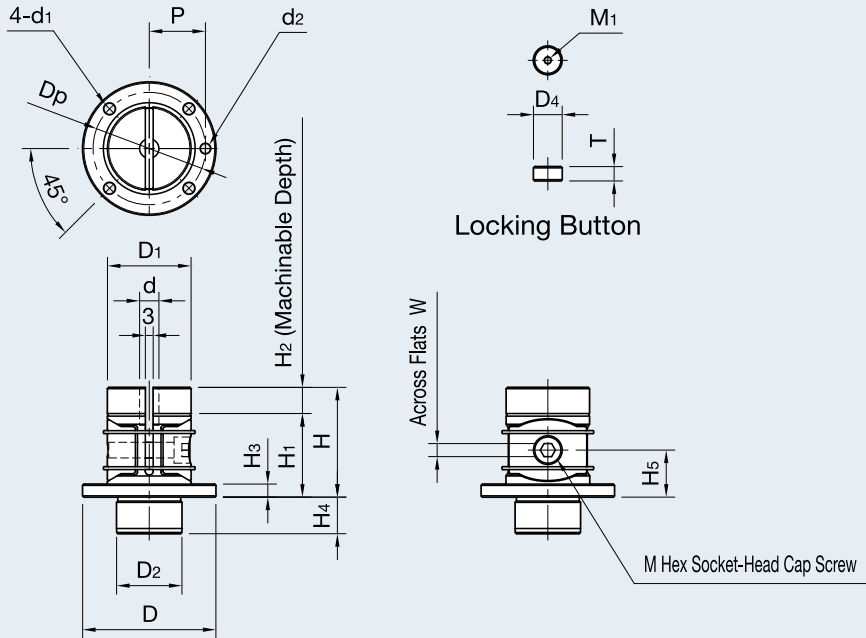
How To Use:



Wedge Style/Round



Body	Wedge
Steel(S45C) Black oxide finished	Steel(S45C) Black oxide finished Quenched & tempered



Part Number	D ₁	d	H	H ₂	D	H ₁	H ₃	D ₂ (g7)	H ₄	d ₁	D _p	d ₂	P
51992218	32	7.4	42	10	51	32	5	25	14	4.5	43	5	21.5
51992219	50	11.4	63	15	75	48	7	40	19	5.5	65	6	32.5

Part Number	M	W	H ₅	M ₁	D ₄	T	Clamping Force (N)	Allowable Screw Torque (N-m)	Weight (kg)
51992218	M 6x1 -25L	5	18	M3x0.5	7	3.5	3,000	9	0.33
51992219	M 10x1.5 -35L	8	27	M3x0.5	11	5.5	7,000	42	1.2

Technical Information:

- Locating repeatability: ±0.08

Furnished Parts:

- 1 of locking button
- Spring pin
(∅ 5x10L for 51992218)
(∅ 6x14L for 51992219)

Notes:

- Do not tighten the clamping screw without the workpiece set to prevent damage and deformation.
- Do not machine the jaws beyond the machinable depth.

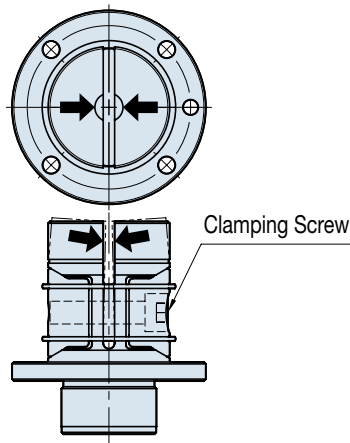
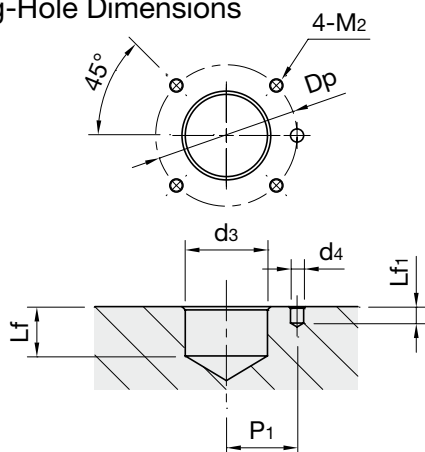
Wedge Style/Round

Features:

- When the clamp screw is tightened, both jaws tilt toward the center to clamp the circumference of the workpiece.
- The clamping stroke is 0.5mm.
- Cutting the machinable jaw to the contours of parts allows holding parts of different shapes.
- Simple and compact design permits multiple-parts holding arrangement.

How To Use

Mounting-Hole Dimensions

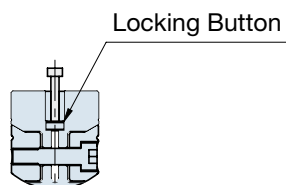
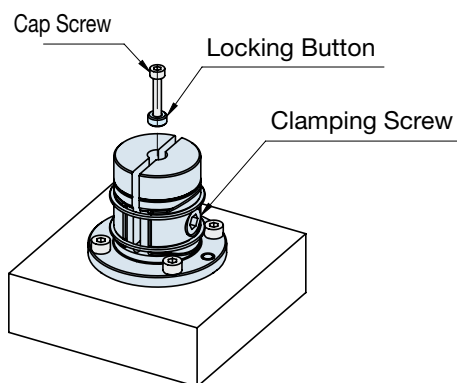


Part Number	d ₃ (H7)	Lf	d ₄ (+0.12)	Lf ₁	P ₁ (±0.05)	M ₂	Dp
51992218	25	15	5	5	21.5	M4×0.7	43
51992219	40	20	6	7	32.5	M5×0.8	65

How To Machine Jaws

① Setting the locking button

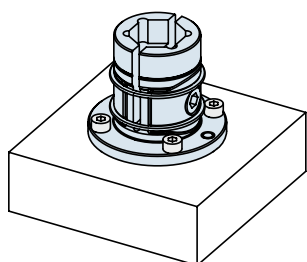
Insert the locking button into the jaw, and then tighten the clamp screw to fasten the locking button. (Using a cap screw facilitates setting)



Note: The locking button must be inserted onto the bottom.

② Machining the jaw

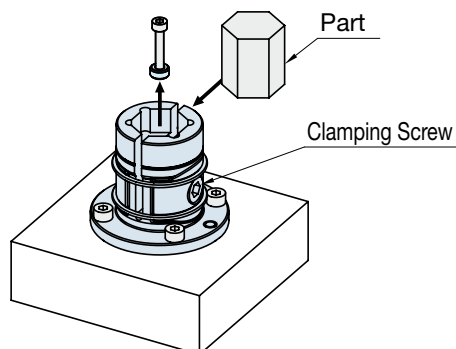
Cut the jaw to the contours of the part.



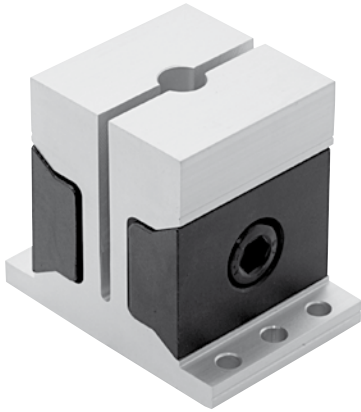
Note: Do not cut beyond the machinable depth.

③ Loading the part

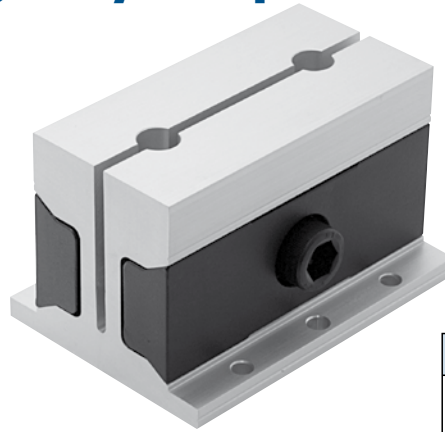
Loosen the clamping screw to remove the locking button. Load the part and tighten the clamping screw for clamping.



Wedge Style/Square

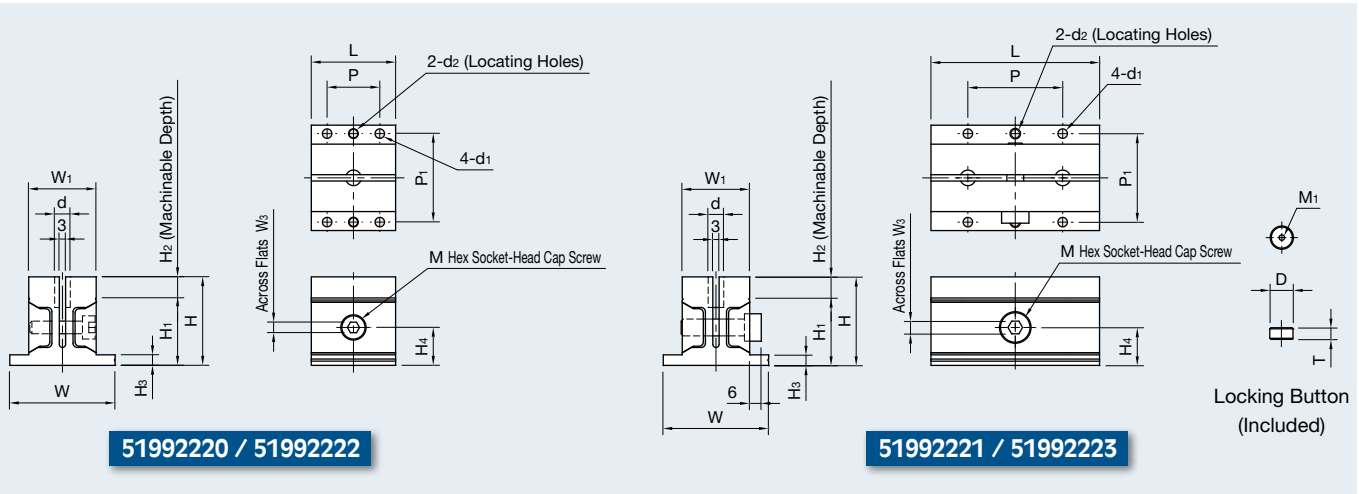


51992220 / 51992222



51992221 / 51992223

Body	Wedge
Aluminum(A6N01)	Steel(SCM440)
Anodized	Black oxide finished
Natural color	Quenched & tempered



51992220 / 51992222

51992221 / 51992223

Part Number	W ₁	d	L	H	H ₂	W	H ₃	H ₁	D ₂ (H7)	d ₁	P	P ₁	M
51992220	32	7.4	40	42	10	50	5	32	5	4.5	25	42	M 6x1 -25L
51992221	32	7.4	80	42	10	50	5	32	5	4.5	45	42	M 8x1.25 -30L
51992222	50	11.4	50	63	15	72	7	48	6	5.5	30	62	M10x1.5 -40L
51992223	50	11.4	100	63	15	72	7	48	6	5.5	58	62	M12x1.75 -45L

Part Number	W ₃	H ₄	M ₁	D	T	Clamping Force (N)	Allowable Screw Torque (N-m)	Weight (kg)
51992220	5	18	M3x0.5	7	3.5	2,500	7.5	0.22
51992221	6	18	M3x0.5	7	3.5	2,500	14	0.42
51992222	8	27	M3x0.5	11	5.5	5,500	26	0.62
51992223	10	27	M3x0.5	11	5.5	5,500	46	1.29

Technical Information:

- Locating repeatability: ±0.08

Furnished Parts:

- 1 of locking button for 51992220/51992222
- 2 of locking button for 51992221/51992223
- 2 of parallel pin (m6 tolerance)
- (ø 5x10L for 51992220/51992222)
- (ø 6x15L for 51992221/51992223)

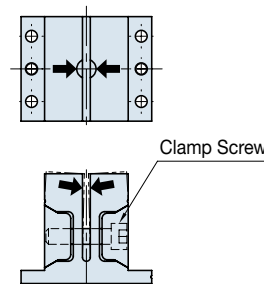
Notes:

- Do not tighten the clamping screw without the workpiece set to prevent damage and deformation.
- Do not machine the jaws beyond the machinable depth.

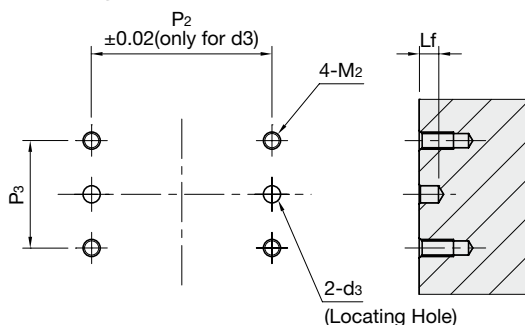
Wedge Style/Square

Features:

- When the clamp screw is tightened, both jaws tilt toward the center to clamp the circumference of the workpiece
- The clamping stroke is 0.5mm.
- Cutting the machinable jaw to the contours of parts allows holding parts of different shapes.
- Simple and compact design permits multiple-parts holding arrangement.



Mounting-Hole Preparation

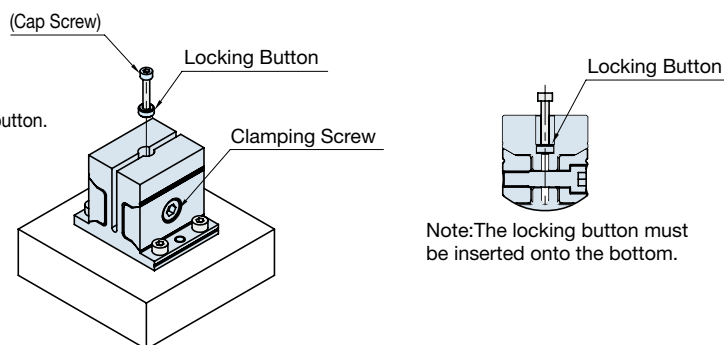


Use the included parallel pin for locating.

Part Number	d ₃ (H7)	Lf	M ₂	P ₂	P ₃
51992220	5	5	M4×0.7	42	25
51992221	5	5	M4×0.7	42	45
51992222	6	8	M5×0.8	62	30
51992223	6	8	M5×0.8	62	58

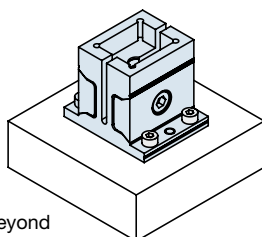
How To Machine Jaws

- ① Setting the locking button
Insert the locking button into the jaw, and then tighten the clamp screw to fasten the locking button. (Using a cap screw facilitates setting)



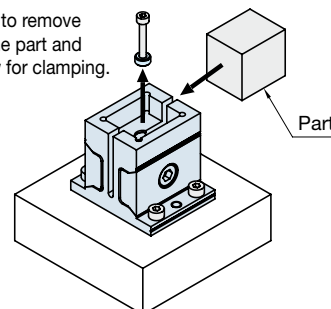
Note: The locking button must be inserted onto the bottom.

- ② Machining the jaw
Cut the jaw to the contours of the part.

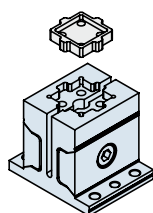


Note: Do not cut beyond the machinable depth.

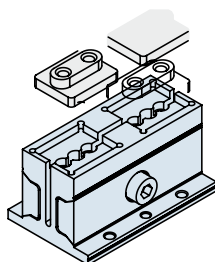
- ③ Loading the part
Loosen the clamping screw to remove the locking button. Load the part and tighten the clamping screw for clamping.



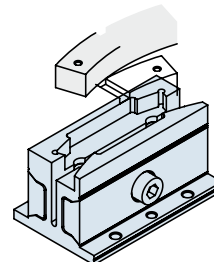
Application Examples



Single-station mode on the short-type clamp



Dual-station mode on the long-type clamp



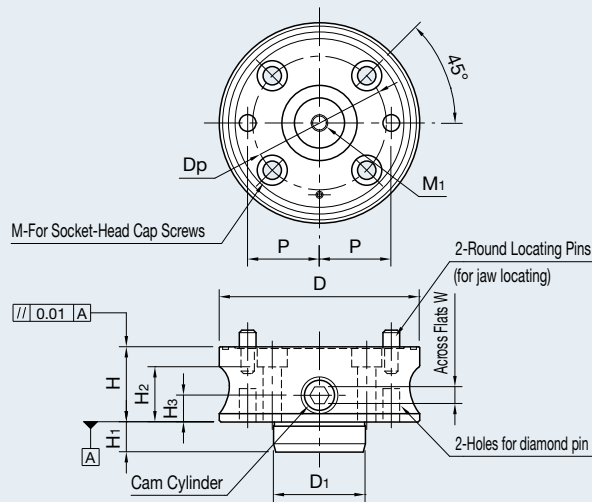
Single-station mode on the long-type clamp



Body	Pull Cylinder	Cam Cylinder
S45C Steel Electroless nickel plated	SCM415 Steel Carburized-hardened Black oxide finish	SCM435 Steel Quenched & tempered Black oxide finish

Note: Jaws must be ordered separately

★ **Key Point**
Can hold on external/internal form.



Part Number	D	H (± 0.01)	D ₁ (g6)	H ₁	M	H ₂	D _p	P (± 0.02)	W	H ₃	M ₁
51992224	65	35	28	12	M 6	27	42	22	8	12	M 8x1.25
51992225	90	40	42	14	M 8	30	60	30	8	14	M10x1.5
51992226	120	45	55	18	M10	33	80	43	10	16	M10x1.5
51992227	160	50	63	24	M12	36	110	60	10	18	M12x1.75

Proper Jaws

Part Number	Allowable Screw Torque (N-m)	Weight (kg)
51992224	15	0,8
51992225	25	1,7
51992226	40	3,5
51992227	40	7,1

For external Form Holding			For internal Form Holding		
Part Number	Clamping Force (kN)	Clamping Stroke	Part Number	Clamping Force (kN)	Clamping Stroke
51992228	4.5	∅ 0.3	51992232	4.5	∅ 0.3
51992229	7	∅ 0.3	51992233	7	∅ 0.3
51992230	10	∅ 0.3	51992234	10	∅ 0.3
51992231	12	∅ 0.3	51992235	10	∅ 0.3

Technical Information:

- Part locating repeatability: ±0.03
- Jaw locating repeatability: ±0.02

Notes:

Do not actuate clamping without a workpiece to avoid damage and deformation. Tightening with torque greater than the allowable screw torque will lower the durability of the jaw.

Furnished Parts:

- 51992224: 1 pc. of Diamond Locating Pin
- 51992225: 1 pc. of Diamond Locating Pin
- 51992226: 1 pc. of Diamond Locating Pin
- 51992227: 1 pc. of Diamond Locating Pin

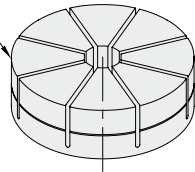
Related Products:

- 51992228/...29/...30/...31: Jaws for External Form Holding
- 51992232/...33/...34/...35: Jaws for Internal Form Holding

Features:

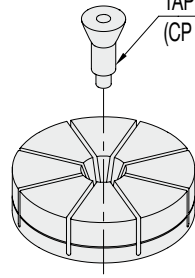
Two optional jaws allow clamping a workpiece both on its external form and internal form.

JAW FOR EXTERNAL FORM HOLDING (CP126)

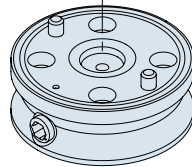


TAPERED SCREW FOR INTERNAL FORM HOLDING (CP 127-B)

JAW FOR INTERNAL FORM HOLDING (CP 127)

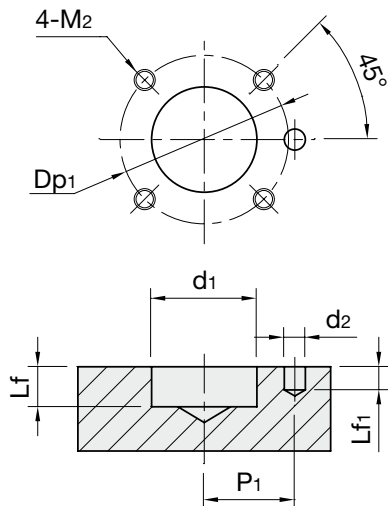


FORM HOLDING CLAMP (CP 125)



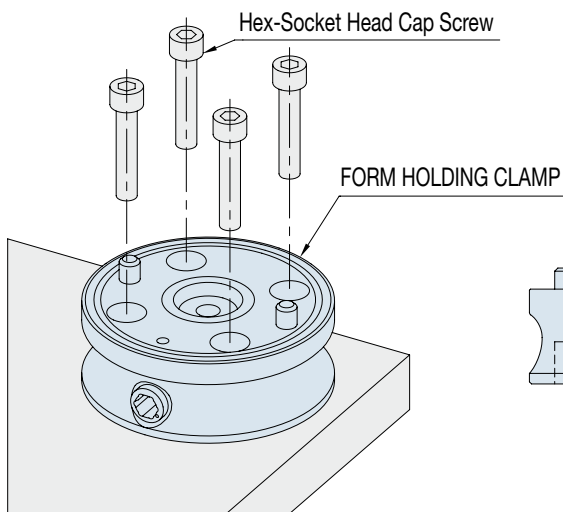
How to use:

Mounting-Hole Dimensions



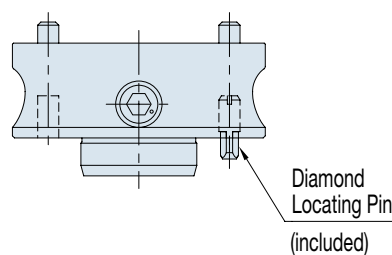
Part Number	d1 H7	Lf	d2 G7	Lf1	P1 ±0.02	M2	Dp1
51992224	28	13	6	6	22	M 6x1	42
51992225	42	15	8	8	30	M 8x1.25	60
51992226	55	19	10	11	43	M10x1.5	80
51992227	63	25	12	13	60	M12x1.75	110

Installation Instructions



Insert an included diamond pin into the body for locating and secure the body to the fixture plate with 4 socket-head cap screws.

Note: Use either of the holes for diamond locating pin for your application.



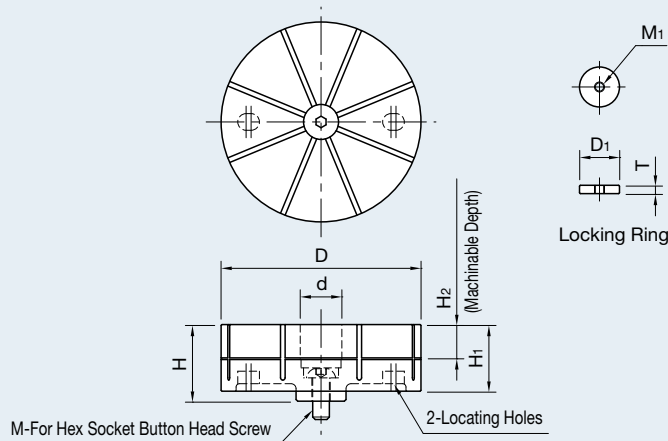
Dimensions of Diamond Locating Pin

Part Number	Diameter
51992224	ø 6h6
51992225	ø 8h6
51992226	ø 10h6
51992227	ø 12h6

for external Form Holding



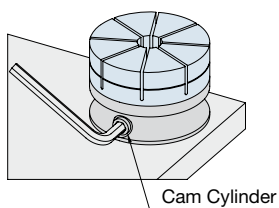
Jaw	Locking Ring
Aluminum (A7075)	Steel (S45C)
Blue	Black oxide finish



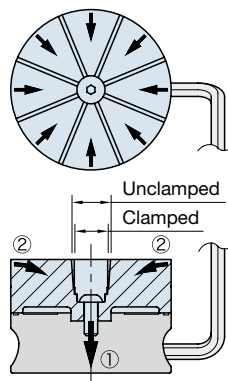
Part Number	D	d	H ₁	H ₂	M	H	M ₁	D ₁	T	Weight (kg)	Proper Clamps
51992228	65	21	25	10	M 8x20L Across Flats5	29	M5x0.8	20	4	0.2	51992224
51992229	90	25	35	15	M10x20L Across Flats6	40	M6x1	24	5	0.5	51992225
51992230	120	25	40	20	M10x25L Across Flats6	46	M6x1	24	5	1.1	51992226
51992231	160	29	45	25	M12x25L Across Flats8	52	M8x1.25	28	6	2.2	51992227

Furnished Parts:

- 1 pc. of O-ring
- 1 pc. of Locking Ring
- 1 pc. of Hex Socket Button Head Screw



Features



- The diaphragm clamping mechanism allows securely clamping a part with 8 jaw sections.
- 0.15mm clamping stroke of each jaw section is perfect for clamping of lost-wax parts, die-cast parts, extruded parts, solid-drawn parts, prefinished parts, etc.

- ① When the cam cylinder is tightened, the central bottom part of the jaw is pulled down.
- ② At the same time the 8 jaw sections tilt toward the center to clamp the external form of a part.

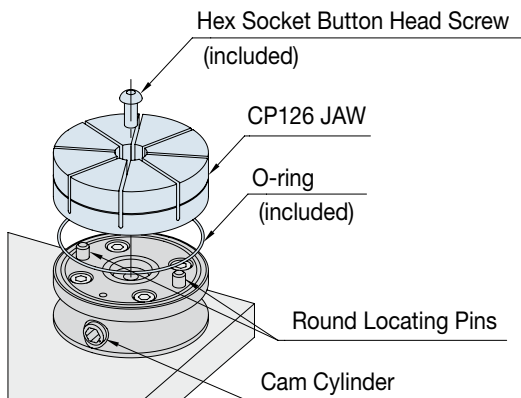
for external Form Holding

How To Use

① Jaw Mounting

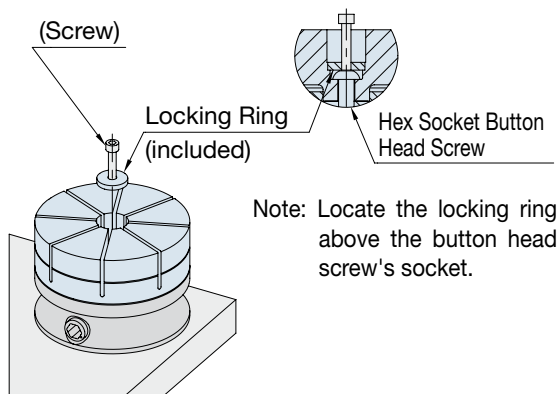
- Insert an O-ring to the groove on top surface of the Form Holding Clamp.
- Set a Jaw putting its locating holes onto the round locating pins and fix it with a hex socket button head screw.

Note: At jaw installation, ensure the cam cylinder is fully loosened by turning counterclockwise until it stops.

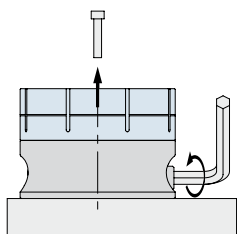


② Jaw Machining

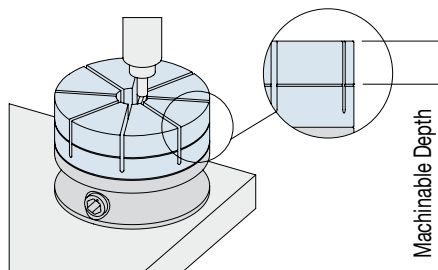
- ②-1 Set the locking ring in the jaw.
(Using a screw facilitates setting.)



- ②-2 Tighten the cam cylinder to clamp the locking ring.
(Recommended Tightening Torque: 15N-m)
After clamping the screw should be removed from the locking ring.

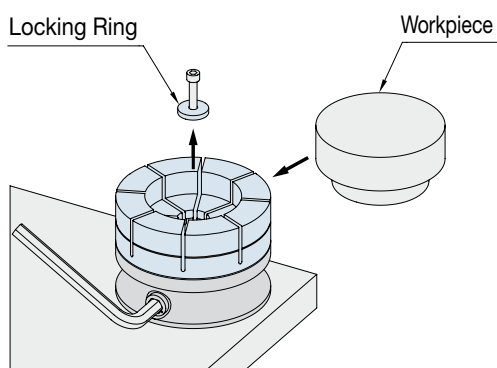


- ②-3 Machine the jaw to the contours of a part.
Note: Do not machine the jaw deeper than allowed.

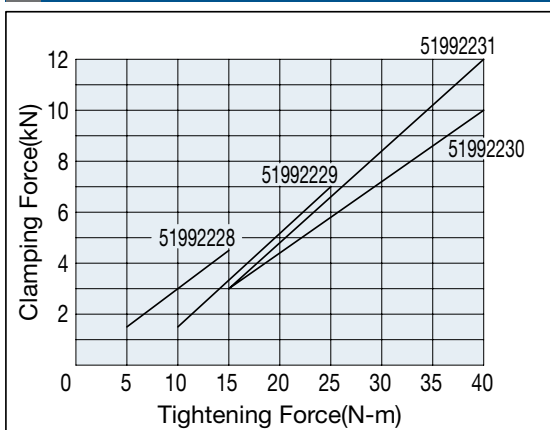


③ Workpiece Setting

- After machining loosen the cam cylinder to take out the locking ring.
- Mount a workpiece and tighten the cam cylinder for clamping.



Performance Curve

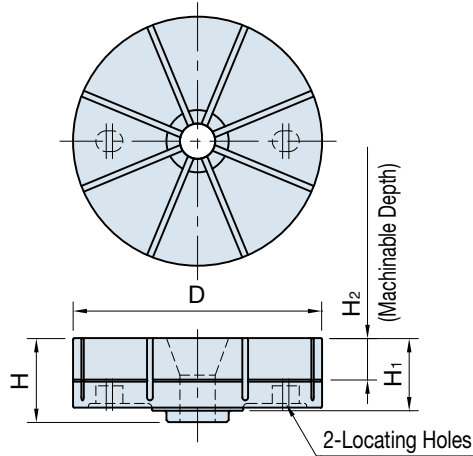


Notes

Do not actuate clamping without a workpiece to avoid damage and deformation. Tightening with torque greater than the allowable screw torque will lower the durability of the jaw.

CP127

JAWS for internal Form Holding



Jaw
Aluminum (A7075)
Silver

Part Number	D	H ₁	H ₂	H	Weight (kg)
51992232	65	25	10	28.5	0.2
51992233	90	30	15	34.5	0.4
51992234	120	35	20	40.5	0.9
51992235	160	40	25	46.5	1.9

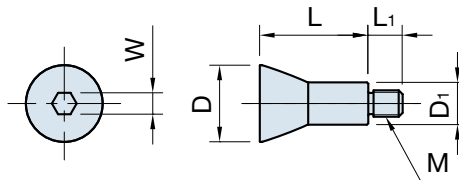
Proper Clamps	Proper Screws
51992224	51992236
51992225	51992237
51992226	51992238
51992227	51992239

Furnished Parts:
• 1 pc. of O-ring

CP127-B

TAPERED SCREWS

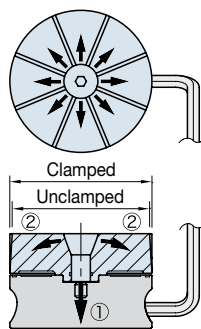
for internal Form Holding



Body
SCM435 Steel
Quenched and tempered
Electroless nickel plated

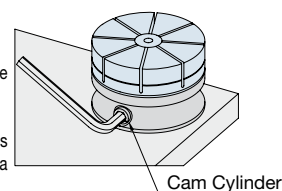
Part Number	D	L	M	L ₁	D ₁	W	Weight (g)	Proper Jaws
51992236	22.5	29	M 8x1.25	10	13.2	6	50	51992232
51992237	27	35	M10x1.5	11	16	8	80	51992233
51992238	29	41	M10x1.5	13	16	8	100	51992234
51992239	33	47	M12x1.75	14	18	10	150	51992235

Features



- The tapered screw expands the jaws towards eight directions to hold different irregularly-shaped parts securely.
- 0.15mm clamping stroke of each jaw section is perfect for clamping of lost-wax parts, die-cast parts, extruded parts, solid-drawn parts, prefinished parts, etc.

- ① When the cam cylinder is tightened, the tapered screw is pulled down.
- ② At the same time the 8 jaw sections expand to clamp the internal form of a part.

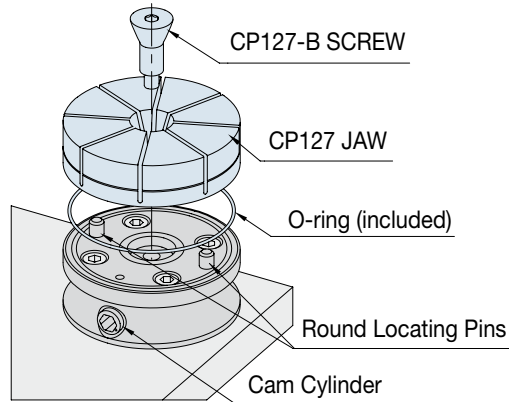


How To Use

① Jaw Mounting

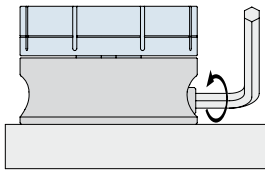
- Insert an O-ring to the groove on top surface of the Form Holding Clamp.
- Set a Jaw putting its locating holes onto the round locating pins and fix it with a tapered screw.

Note: At jaw installation, ensure the cam cylinder is fully loosened by turning counterclockwise until it stops.

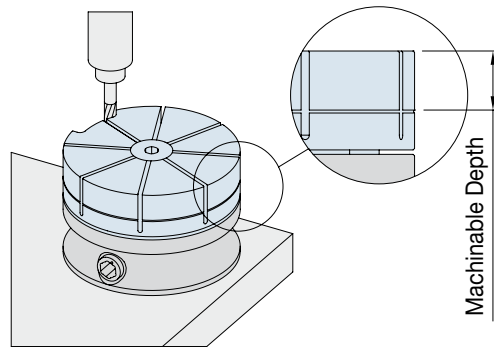


② Jaw Machining

- ②-1 Loosen the cam cylinder fully and measure the dimension of the jaw for machining. Then tighten the cam cylinder until each jaw section expands 0.15mm.

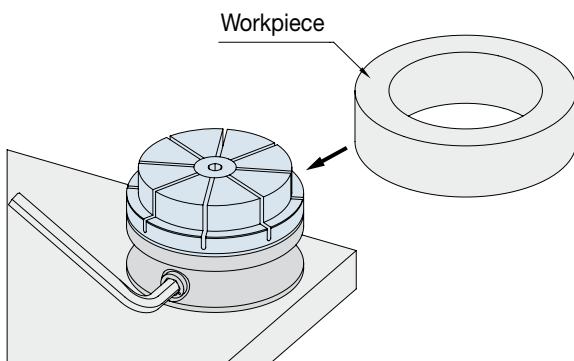


- ②-2 Machine the jaw to the contours of a part.
Note: Do not machine the jaw deeper than allowed.

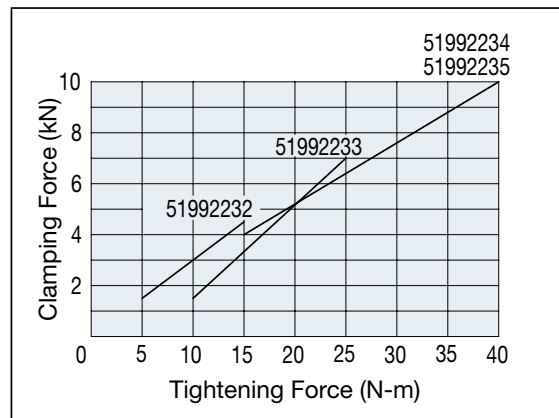


③ Workpiece Setting

After machining loosen the cam cylinder to set a part and tighten the cam cylinder again for clamping.



Performance Curve



Notes

Do not actuate clamping without a workpiece to avoid damage and deformation. Tightening with torque greater than the allowable screw torque will lower the durability of the jaw.

