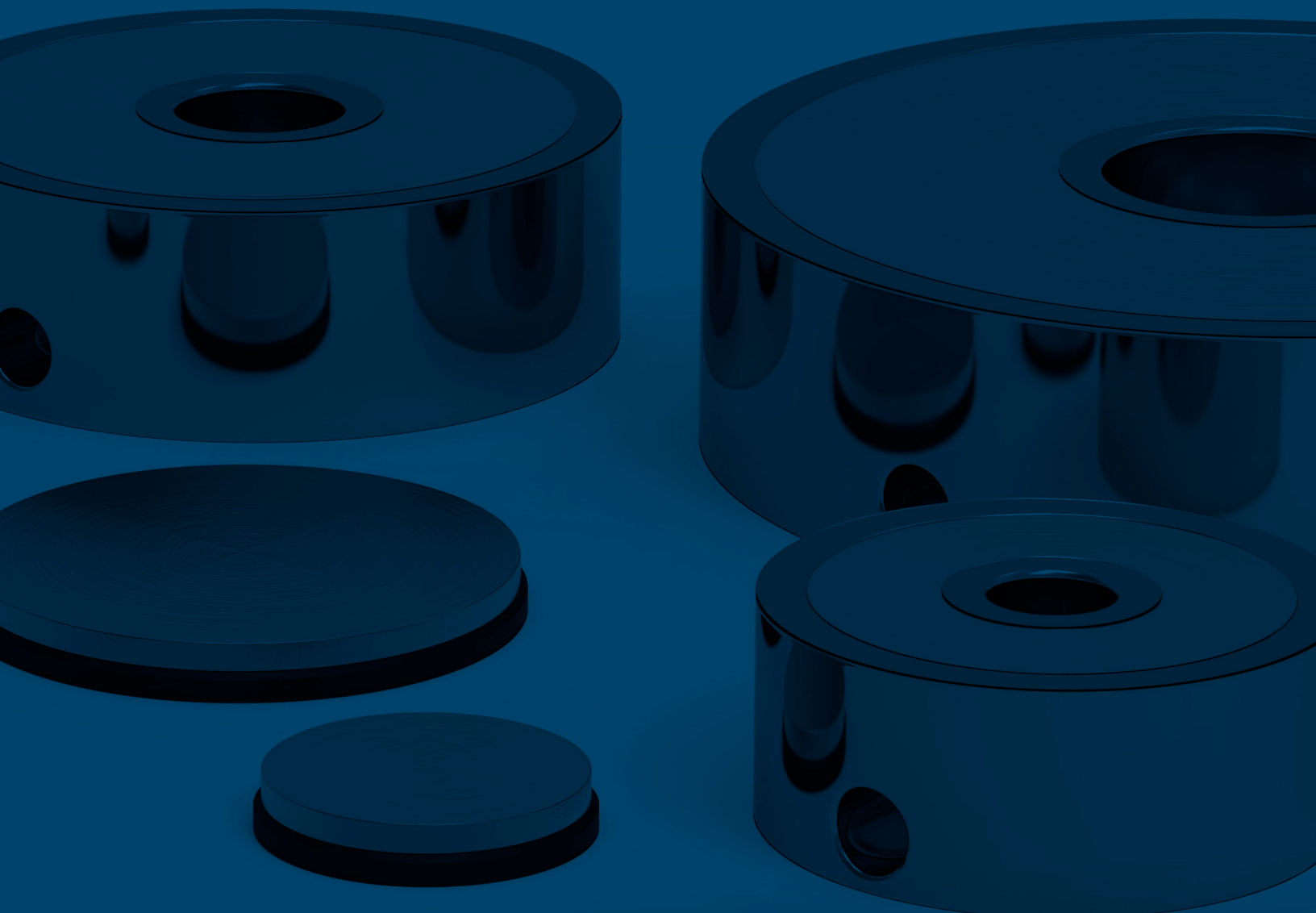




HYDRAULIC CLAMP DISKS & CLAMP RINGS

LOCK CONNECTING MACHINE COMPONENTS TO EACH OTHER WITH HYDRAULIC PRESSURE

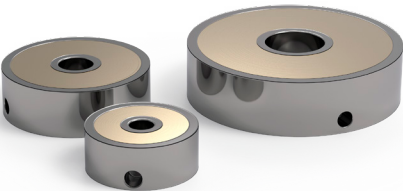


HYDRAULIC CLAMP DISKS & CLAMP RINGS

Our Clamp Disks (ACD) and Clamp Rings (ACR) have been developed to lock connecting machine components to each other by hydraulic pressure. The simple and compact design allows these components to be used in a variety of applications. Tare made of a high strength bronze piston disk on which a Viton seal is vulcanized, allowing them to be used with any high pressure hydraulic fluid. The components are connected to a pressure port to allow hydraulic pressure up to 4000 psi. The holding force of these units depends on the amount of hydraulic pressure applied. Tables on pages 4 (ACD) and 5 (ACR) show holding forces based on 1000 psi at $\mu s = 0.1$.

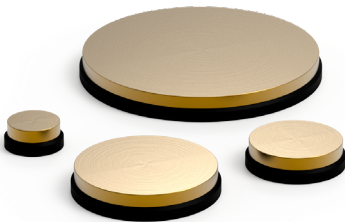
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CLAMP RINGS

Hydraulic clamp rings provide a secure, friction-locked shaft-hub connection in a compact, easy-to-install design. Engineered for high torque transmission without backlash, they ensure reliable, vibration-resistant performance across a variety of mechanical and automation applications. With uniform force distribution and maintenance-friendly construction, these clamp rings are the ideal choice for achieving precise, repeatable shaft-hub connections in demanding industrial environments.



CLAMP DISKS

Hydraulic clamp disks provide friction-locked, backlash-free shaft-hub connections in a compact, maintenance-friendly design. These versatile components ensure uniform force distribution and high torque transmission, making them ideal for dynamic applications in machinery and automation. The unique construction offers easy assembly and disassembly, contributing to reduced downtime and increased efficiency across a wide range of industrial settings.

TYPICAL ARRANGEMENTS

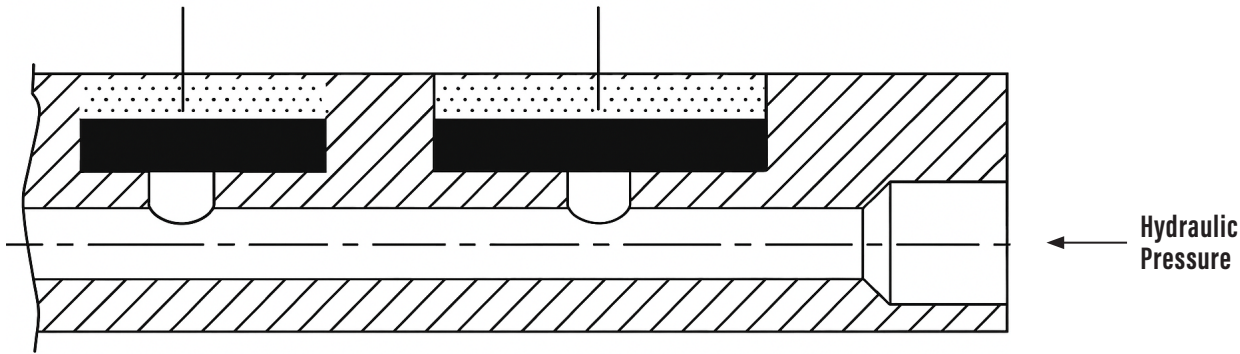


Figure 1: Clamp disks in a parallel gib, oil pressure through feeder hole.

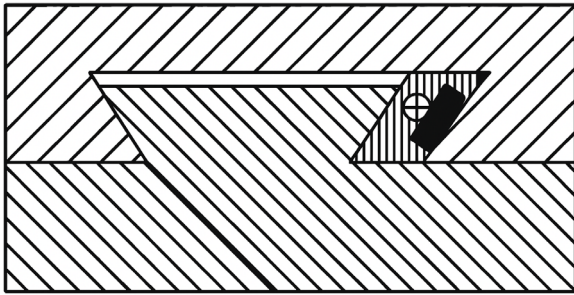


Figure 2: Typical dovetail gib design.

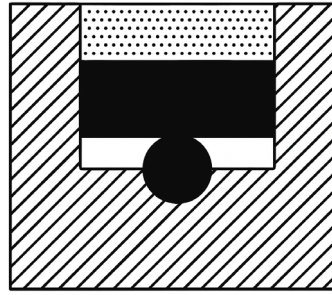


Figure 3: Pressure port feeder hole intersecting Clamp Disk bores.

ASSEMBLY INSTRUCTIONS (ACD CLAMP DISKS)

Assembly tools consists of a plunger, tapered sleeve, and centering disk.

1. Grease tapered bore of tapered sleeve and insert clamp disk into tapered sleeve with seal lip downward.
2. Center tapered sleeve on centering disk and push plunger downward to partially insert the seal lip of the clamp disk into the centering disk. Fig. 4
3. Remove tapered sleeve with protruding seal lip and insert into the greased housing bore. Fig. 5
4. Press plunger downward to insert clamp disk into the housing bore.

ASSEMBLY TOOLS & PROCEDURE

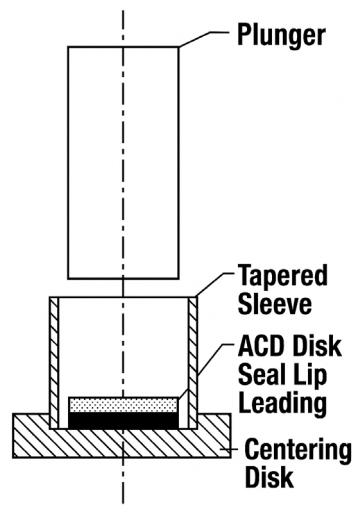


Figure 4

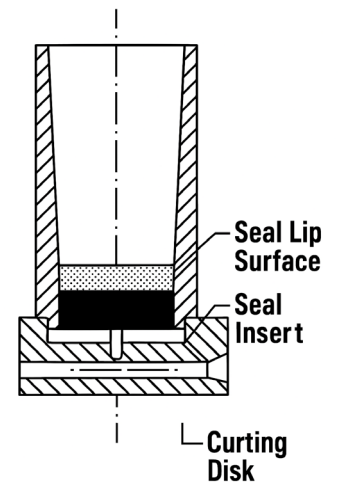


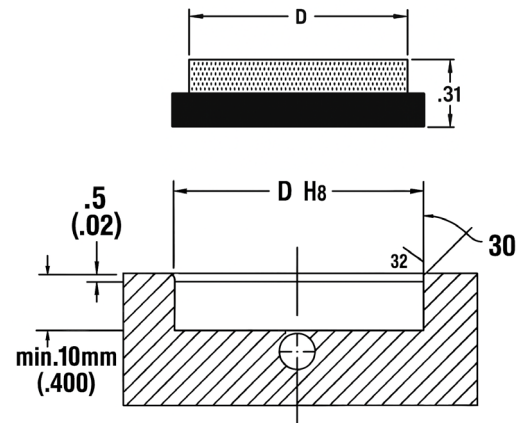
Figure 5

CLAMP DISKS (TYPE ACD)

Size	D	Bore ØD Tolerance	Area (A)	Assembly Tool No.*	Clamp Force
	mm/inch	(inches) H ₈	mm ² (in ²)		@ 1000 psi
ACD-16	16/.630	.630/.631	210 (.312)	ACDT-16	300
ACD-22	22/.866	.866/.867	380 (.589)	ACDT-22	560
ACD-28	28/1.102	1.102/1.103	616 (.955)	ACDT-28	910
ACD-32	32/1.260	1.260/.261	804 (1.25)	ACDT-32	1200
ACD-42	42/1.654	1.654/1.655	1385 (2.15)	ACDT-42	2100
ACD-52	52/2.047	2.047/2.049	2124 (3.29)	ACDT-52	3200
ACD-64	64/2.520	2.520/2.522	3217 (4.99)	ACDT-64	4800
ACD-75	75/2.953	2.953/2.955	4418 (6.85)	ACDT-75	6500

Maximum hydraulic pressure not to exceed 4000 psi.

*See Figures 4 & 5



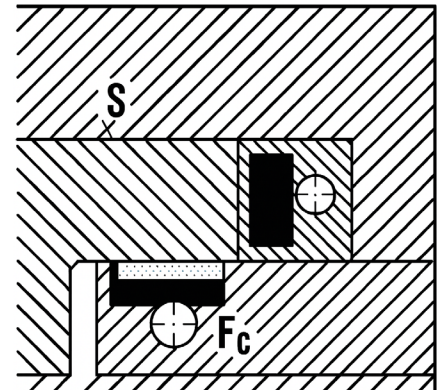
Customer supplied bore requirements.

CALCULATIONS FOR CLAMP DISKS

The clamping force (F_c) on the slide must be sufficient to lock the sliding components to the machine ways by means of friction at surface (S) only. The force (F_c), on the Clamping Disks must act in an axial direction only. There should not be any side load on the seal lips and bronze disk.

MATING CONDITIONS FOR CLAMP DISKS

Clamp disks require only a simple bore with a tolerance of I.S.O. H8, and a surface finish of 32 micro-inches. The hole for the clamp disk is usually bored and hand polished with emery cloth to eliminate tool marks on the sealing surface. The port holes must be deburred and cleaned. The hole depth must be a minimum of 0.400".



Calculating The Holding Force:

$$H = (A) \times (p) \times (\mu_s) \times (n) \times .95$$

$$= (F_c) \times (\mu_s) \times (n) \times .95$$

$$H = \text{Total holding force [lbs]}$$

$$F_c = \text{Clamping force for a single disk [lbs]}$$

$$n = \text{Number of clamp disks}$$

$$A = \text{Area of one clamp disk in [in}^2\text{]}$$

$$p = \text{Hydraulic pressure [psi]}$$

$$\mu_s = \text{Static coefficient of friction between lubricated surfaces at S}$$

$$= (.12) - \text{steel on steel}$$

$$= (.10) - \text{steel on cast iron}$$

$$= (.08) - \text{steel on plastic material}$$

$$.95 = \text{Efficiency of hydraulic piston}$$

Example:

To find number of clamp disks required:

Required holding force: 2,000 lbs.

Available pressure: 1,000 psi.

Max. disk size: 52 mm ($A = 3.29 \text{ in}^2$)

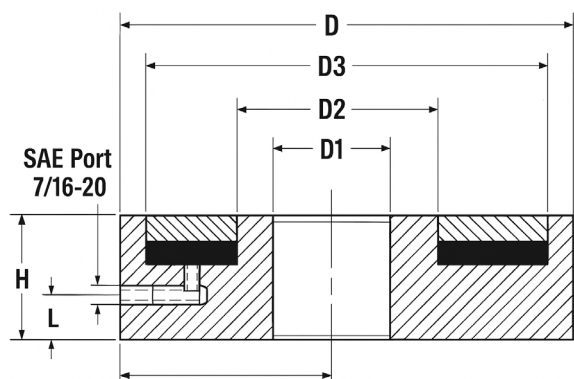
Surfaces: steel on steel ($\mu_s = 0.12$)

$$n = \frac{H}{A \cdot p \cdot \mu_s \cdot .95}$$

$$= \frac{2000 \text{ lbs}}{(3.29 \text{ in}^2) \cdot (1000 \text{ psi}) \cdot (.12) \cdot .95} = 5.33$$

Required: (6) Clamp Disks, size ACD-52

CLAMP RINGS (TYPE ACR)



Type	D	D1	H	L	D2	D3	Area (A)	Max Stroke	Clamp Force	Clamp Force
							mm ² (in ²)	mm (in)	@1000 psi	@4000 psi
ACR-60	60	14.3	30	8	24	50	1512 (2.34)	3 (.118)	2100	8450
ACR-75	75	16.3	30	8	28	62	2403 (3.72)	3 (.118)	3350	13400
ACR-90	90	20.3	32	8	32	75	3614 (5.60)	4 (.157)	5050	20200
ACR-105	105	24.5	34	10	36	92	5630 (8.73)	4 (.157)	7900	31500
ACR-125	125	30.5	36	10	42	112	8467 (13.12)	5 (.197)	11800	47200
ACR-155	155	42.5	40	10	55	140	13018 (20.18)	5 (.197)	18200	72600

Maximum hydraulic pressure not to exceed 4000 psi.

Dimensions subject to change without notice.

Calculating The Clamping Force:

F_c = Clamping force for a single disk [lbs]

A = Area of one clamp disk in [in²]

p = Hydraulic pressure [psi]

$$\text{Clamping Force (Fc)} = A \cdot p \cdot 0.9$$



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