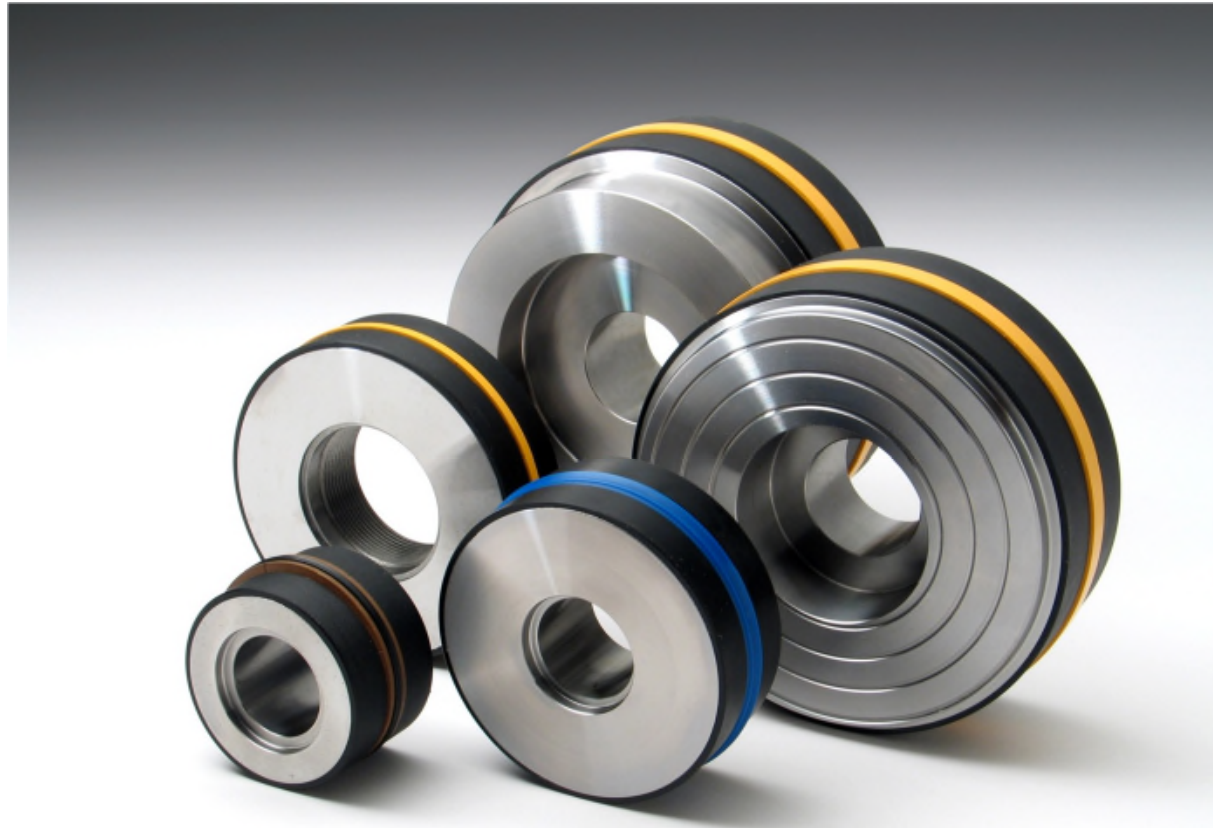


MCP LLC

Machined Custom Products



COHESIVE PISTON

By Definition...

A GREAT SOLUTION

The Cohesive Piston is a complete, self-contained piston, bearing and seal in one assembly. The piston body is machined to exact dimensions. The non-metallic bearing material is molded to the piston using a special proprietary process. It is then machined to the final precise OD dimension and the seal is installed.

The Cohesive Piston has continued to develop as a unique solution in a wide range of design applications. The Cohesive Piston provides the longest service life, while reducing critical components of manufacturing expense; material and labor.

Manufactured today in a wide range of sizes, bearing and seal materials, the Cohesive Piston is available off the shelf from 1.500" up to a 6.000" OD, in 0.500" increments.

Contact us today. Our business is working with you to identify the optimal design solution for your demanding application, and providing that engineered solution to meet your exacting standards.

TYPICAL PISTON CONCERNS

Tolerance stack up

Application

Side loading

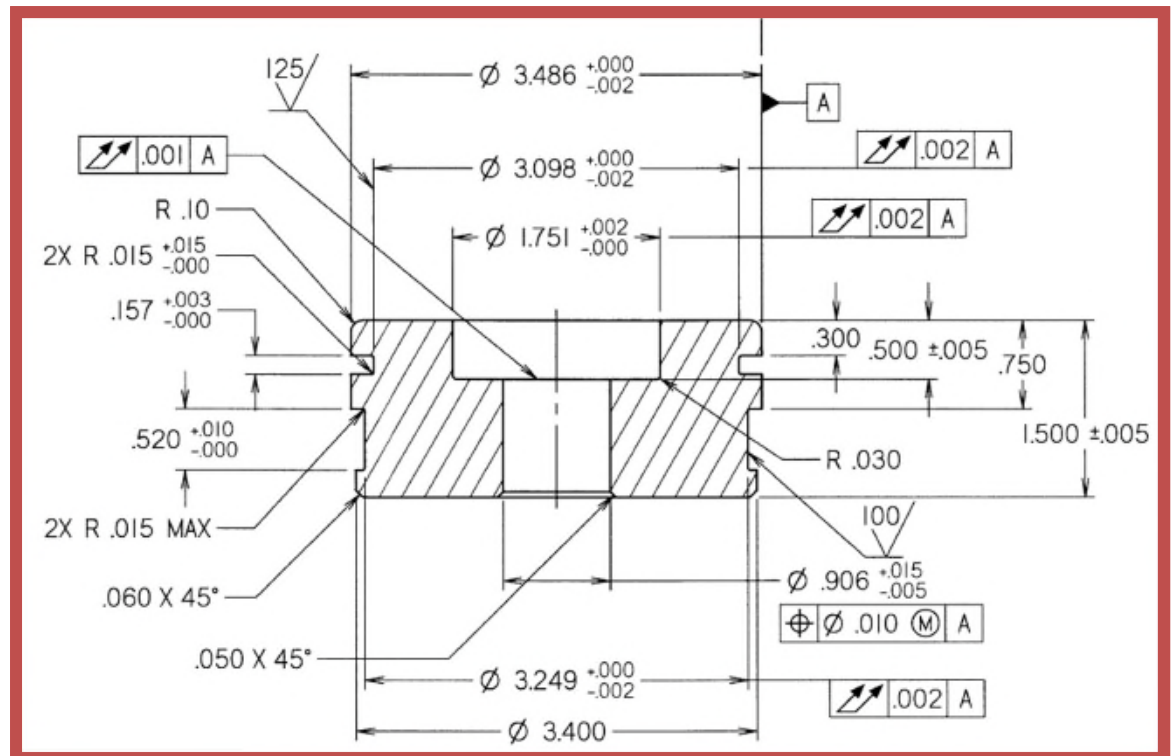
Groove contamination

Seal extrusion

Proper seal installation

Design standardization

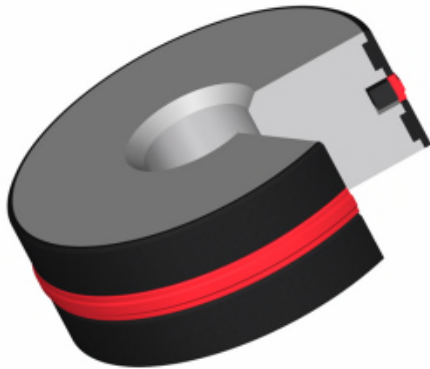
Engineering, manufacturing, and support resources



FEATURES & BENEFITS

FEATURES:

- Maximum close tolerance
 - (0.001-0.005" below bore)
- Multiple Sealing Options
- Minimum piston & rod deflection
- Heavy Duty pressure capabilities
- Compact design
- Finished Cohesive Piston ready for installation
- Wide range of designs



BENEFITS:

- Eliminate metal to metal contact potential
- Extend Longevity of piston seal
- Extend cylinder performance life
- 5000psi operating capability
- Ease of field service and retrofit
- Enables increase in stroke length
- Eliminate in-house machining & assembly
- Avoid costly Equip & Manpower investment
- Reduce Inventory, Purchasing cost & Complexity
- Reduce Premature failures – related Warranty claims
- Reduce total production cost
- Reduce business overhead
- Reduce procurement cost
- Reduce Piston and Sealing package cost

Improve cylinder performance while reducing cost and provide more resources for core business.

MARKETS

- **Agricultural Equipment**
- **Construction Equipment**
- **Cranes**
- **Forestry Equipment**
- **Hydraulic Booms**
- **Industrial Hydraulic Cylinders**
- **Material Handling**
- **Mining**
- **Off Highway Equipment**
- **Pneumatic Cylinders**
- **Tire Pressses**
- **And more**

APPLICATIONS

- **Hydraulic double or single acting cylinders**
- **High pressure service**
- **Medium pressure service**
- **Piston accumulators**
- **High production**
- **Low consumption (standard sizes)**
- **JIT operations**

OTHER CONSIDERATIONS

Where is the Market Headed?

- Higher Pressures
- Higher Operating Temperatures
- Longer Warranty Periods
- Competitiveness – Import pressure

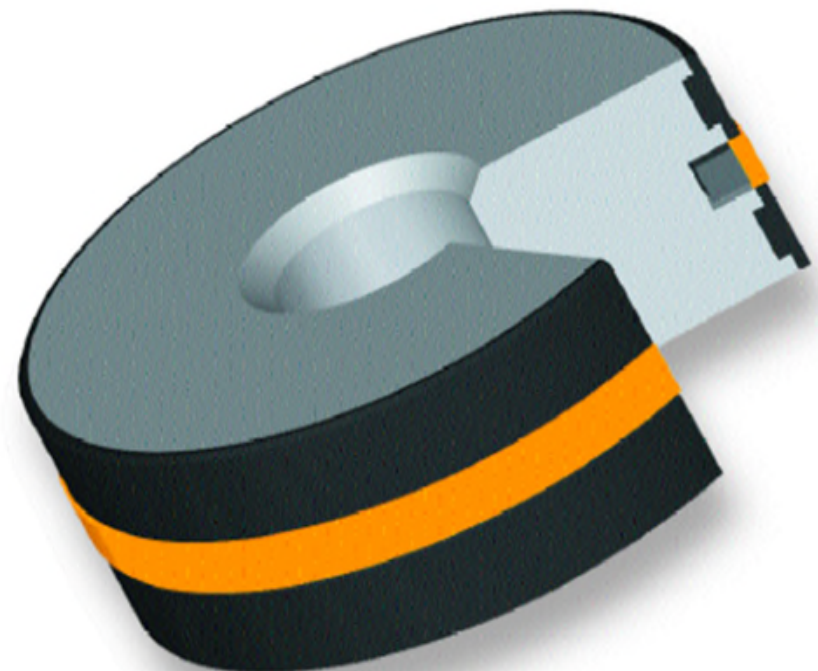
Unitized Pistons and Glands

- ❖ 5000 psi standard design; 10,000 psi+ Extreme designs
- ❖ High Temperature Capable (seals & bearings)
- ❖ Cylinder Longevity – Performance Product
- ❖ Total Cost Solution

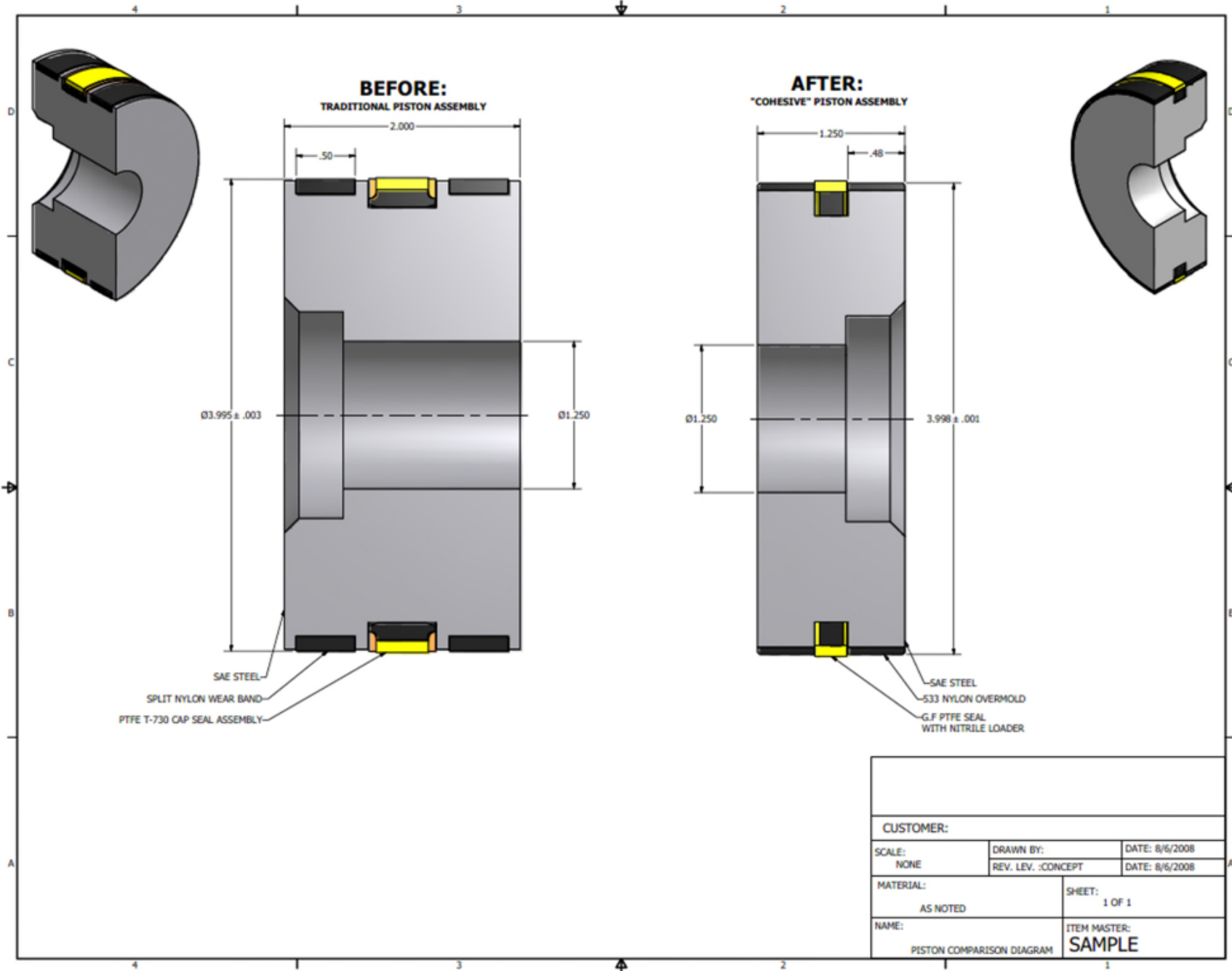


Cohesive Pistons

**WILL KEEP YOUR CYLINDERS
OPERATING AT MAXIMUM EFFICIENCY**



Traditional Piston vs. Cohesive Piston



Cohesive Piston Standard Stock Sizes

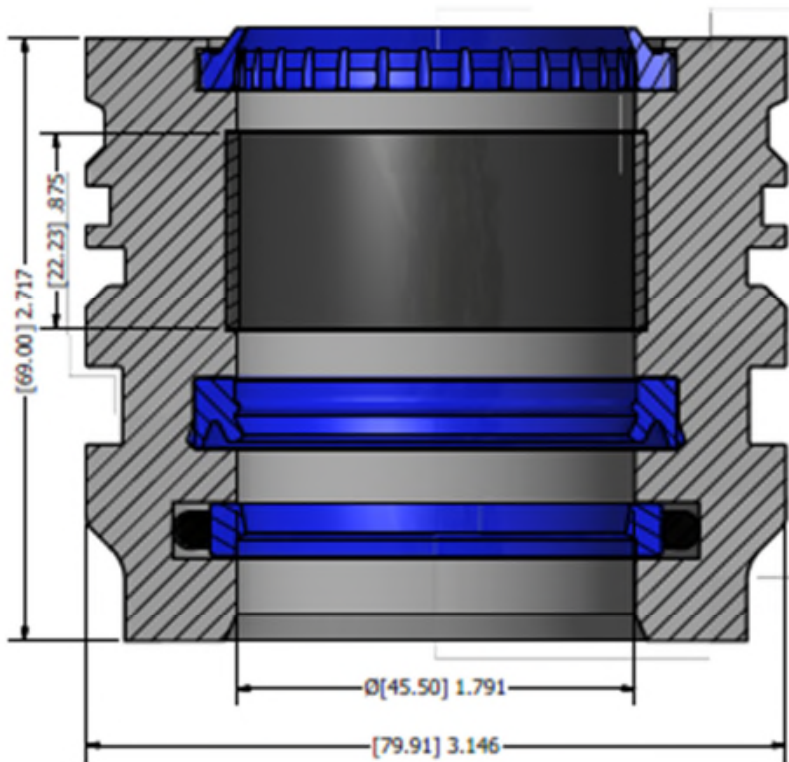
BORE DIA +.003 -.000	PISTON OD ±0.001	LENGTH	THROUGH HOLE	GROOVE DIA	GROOVE WIDTH	ITEM MASTER NUMBER
1.500	1.498	1.000±.010	.500±.001	1.238±.002	.083±.002	H1380
2.000	1.998	1.000±.010	.750±.001	1.604±.002	.130±.002	H1381
2.250	2.248	1.000±.010	1.000±.001	1.858±.002	.130±.002	H1443
2.500	2.498	1.000±.010	1.000±.001	2.104±.002	.130±.002	H1382
3.000	2.998	1.000±.010	1.000±.001	2.604±.002	.130±.002	H1383
3.500	3.498	1.000±.010	1.000±.001	3.104±.002	.130±.002	H1384
3.500	3.498	1.500±.010	1.000±.001	3.104±.002	.130±.002	H1385
4.000	3.998	1.000±.010	1.000±.001	3.465±.002	.279±.002	H1386
4.000	3.998	1.500±.010	1.000±.001	3.465±.002	.279±.002	H1387
4.500	4.498	1.500±.010	1.000±.001	3.965±.002	.279±.002	H1388
5.000	4.998	1.250±.010	1.500±.001	4.465±.002	.279±.002	H1389
5.000	4.998	1.750±.010	1.500±.001	4.465±.002	.279±.002	H1390
6.000	5.998	2.500±.010	1.500 ±.001	5.224±.002	.378±.002	H1359
6.500	6.498	X.XXX±.010	X.XXX±.001	X.XXX±.002	X.XXX±.002	H1XXX
7.000	6.998	2.500±.010	2.000±.001	6.222±.003	.378±.002	Ref - H1336
7.500	7.498	X.XXX±.010	X.XXX±.001	X.XXX±.002	X.XXX±.002	H1XXX
8.000	7.998	2.500±.010	2.250±.001	7.222±.003	.378±.002	Ref - H1337
9.000	8.998	2.500±.010	2.500±.001	8.122±.003	.378±.002	Ref - H1378

COHESIVE GLAND

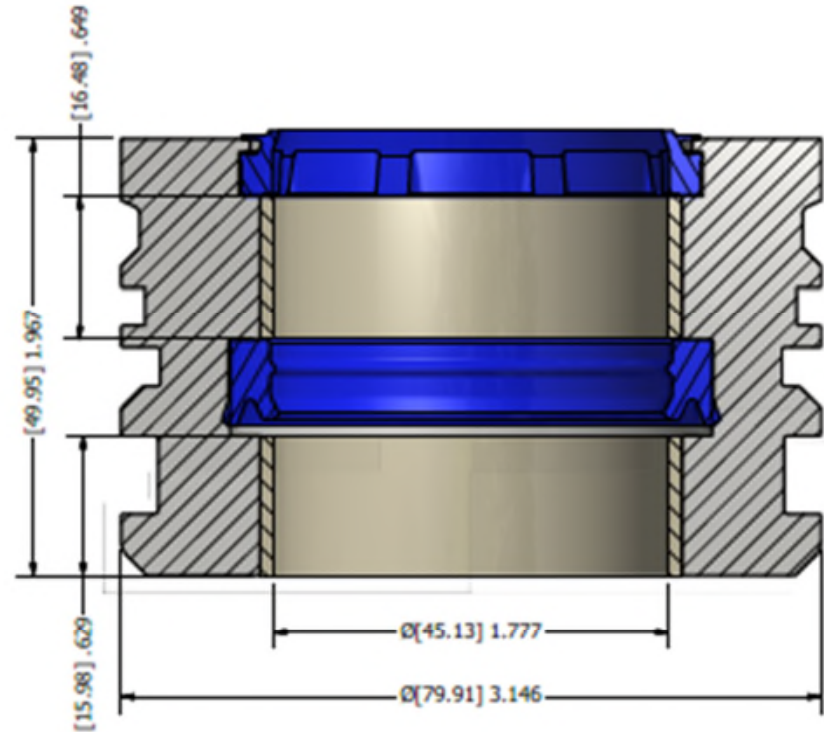


The Cohesive Gland is a complete, self-contained gland, bearing and seals in one assembly. The gland body is machined to exact dimensions. The non-metallic bearing material is molded to the gland using a special proprietary process. It is then machined to the final precise ID dimension and the seal and wiper are installed.

Traditional Gland vs. Cohesive Gland



TRADITIONAL GLAND
- 3.05 LBS / 1.38 KG
- .875 / 22.23mm BEARING LAND



COHESIVE GLAND
- 2.16 LBS / .98 KG
- 1.278 / 32.461mm BEARING LAND

MCP LLC

Machined Custom Products

RARELY VISIBLE... ALWAYS CRITICAL!

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