

MACROTECH POLYSEAL, INC.
Seal Design and Manufacturing

CTS-1000
Revised 10/93



CAPPED T-SEAL

HIGH-PERFORMANCE PISTON SEAL



Capped T-Seal

MACROTECH/POLYSEAL CAPPED T-SEAL

Macrotech's Capped T-Seal is a double-acting, high pressure, high performance piston seal, accommodating larger extrusion gaps when used with Macrotech close tolerance WGT wear rings. Major features are excellent extrusion resistance, low friction and low wear in a compact, stable design.

The Capped T-Seal assembly consists of a filled PTFE cap and an elastomeric energizer. These two components are protected from extrusion and foreign material by two plastic anti-extrusion rings.

Macrotech Capped T-Seals are available in a wide range of materials suitable for various fluid power and industrial services. The cap ring can be produced from almost any PTFE compound. However, compounds containing glass, carbon or bronze are the most popular. Moly-filled nylon anti-extrusion rings are used for most hydraulic services. Other materials are available for more aggressive applications.

Basic 70 Shore A Nitrile, either low temp (-65° F) or standard is the most common energizer, however other elastomeric compounds may be used for specific applications. These materials are shown on page 5 of this brochure. You may want to check with Polyseal customer service for available tooling before designing non-standard materials.

OVERSIZED BORES

The design criteria of the Macrotech Capped T-Seal allows for its use in oversized bores. To ensure maximum life and sealability when ordering for oversized bores, state **exact gland and bore dimensions!** Cap rings and back-up rings will be manufactured accordingly.

The actual range of oversized bore conditions in which the Macrotech Capped T-Seal can be used varies with the cross-section and diameter of the seal.

METAL SURFACE FINISH

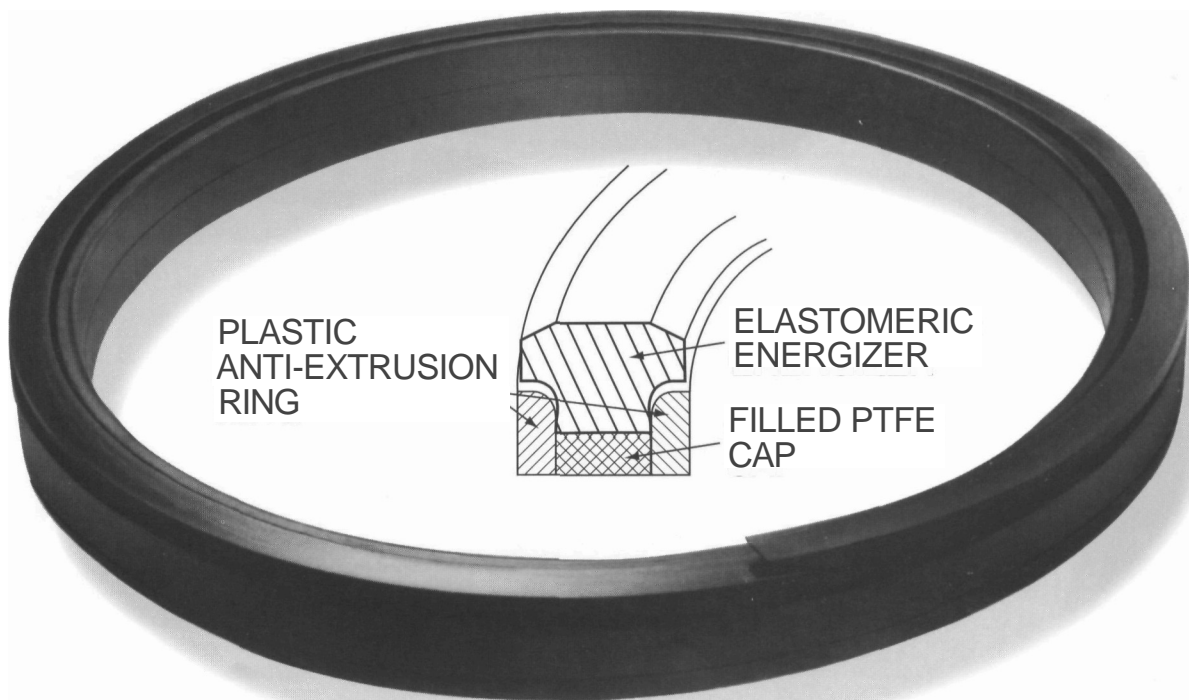
Static surfaces should not exceed 32 RMS. Dynamic surfaces should not exceed 16 RMS.

DIMENSION AND GLAND DESIGNS

Macrotech Capped T-Seal are available in standard (CT, EK), metric (MK), mil std., and special series. Consult Polyseal Engineering for size or gland dimensions not shown.

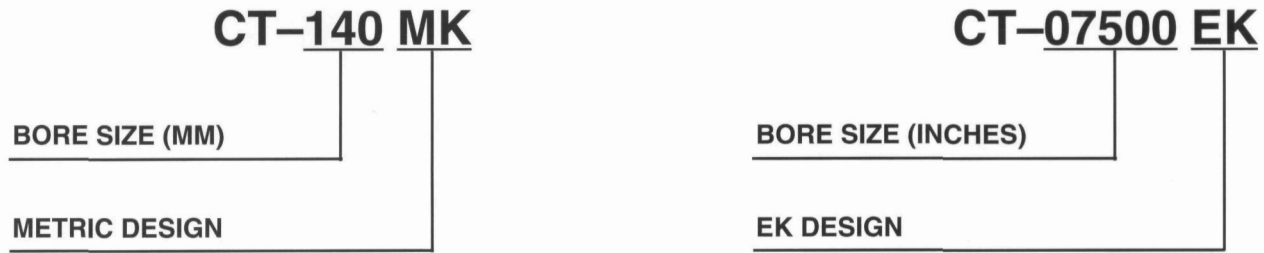
USING CLOSE TOLERANCE WEAR GUIDES

By incorporating the use of Close Tolerance Wear Guides in the design of your piston seal package you greatly enhance the sealability and seal life of your Capped T Seal. Macrotech/Polyseal Engineering people will work with you to design a total seal package including rod seals and excluders to fit your needs.



Capped T-Seal

MK AND EK SERIES NUMBERING SYSTEM



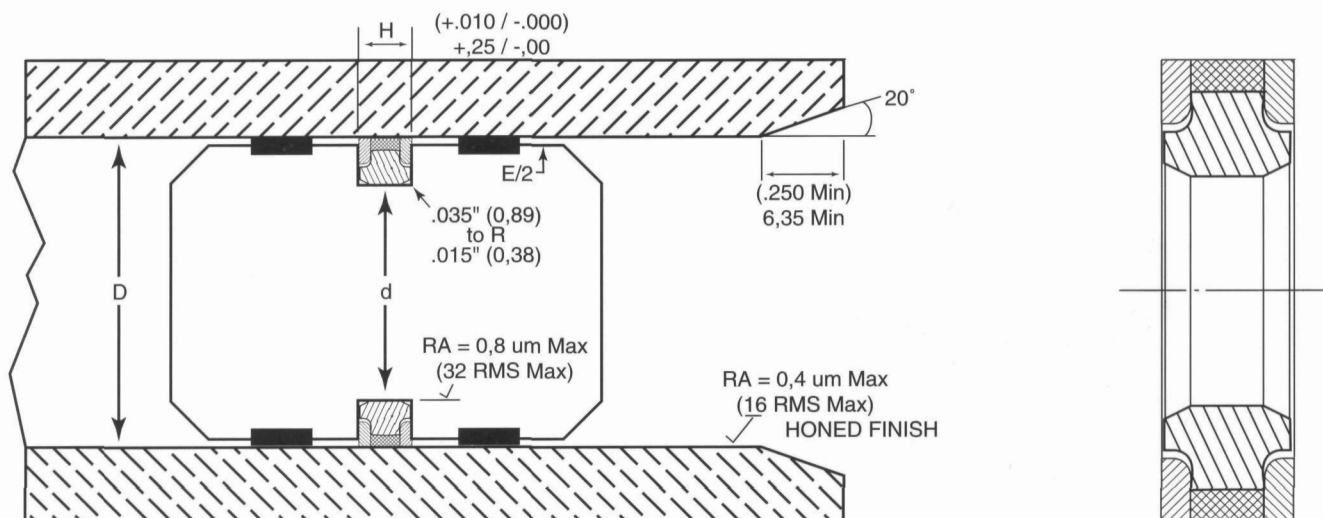
The MK-EK design is primarily used in narrow groove pistons often seen in equipment manufactured in the Pacific Rim area. It is always recommended groove dimensions are measured before retrofitting Capped T Seals.

RECOMMENDED GLAND DIMENSIONS FOR MK AND EK SERIES

"D" BORE DIAMETER (INCHES) MM	BORE TOLERANCE (INCHES) MM	"d" GROOVE DIAMETER (INCHES) MM	GROOVE Ø TOLERANCE (INCHES) MM	"H" GROOVE WIDTH (INCHES) MM	E* DIAMETRICAL CLEARANCE
(13/4-2 3/8) 50 - 60 MM	(+.002/-.000) +0,05/-0,00	(0"D"-.551) 0"D" - 14,00	(+.000/-.002) +0,00/-0,05	(.354) 9,00	(.025 MAX) ,64 MAX
(21/2-31/2) 65 - 90 MM	(+.003/-.000) +0,08/-0,00	(0"D"-.591) 0"D" - 15,00	(+.000/-.003) +0,00/-0,08	(.433) 11,00	(.025 MAX) ,64 MAX
(3 3/4 - 4 3/4) 95- 120 MM	(+.004/-.000) +0,10/-0,00	(0"D"-.591) 0"D" - 15,00	(+.000/-.004) +0,007/-0,10	(.492) 12,50	(.030 MAX) ,76 MAX
(5 - 9 3/4) 125 -245 MM	(+.005/-.000) +0,13/-0,00	(0"D" -.906) 0"D" - 23,00	(+.000/-.005) +0,007/-0,13	(.630) 16,00	(.035 MAX) ,89 MAX
(10-121/2) 250 - 320 MM	(+.005/-.000) +0,137/-0,00	(0"D"-1.102) 0"D" - 28,00	(+.000/-.005) +0,007/-0,13	(.689) 17,50	(.035 MAX) 0,89 MAX

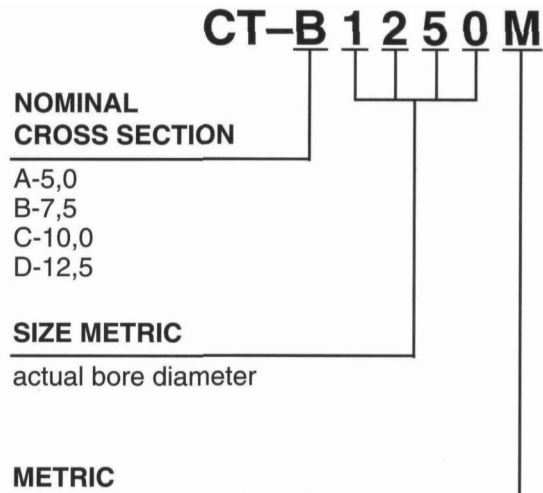
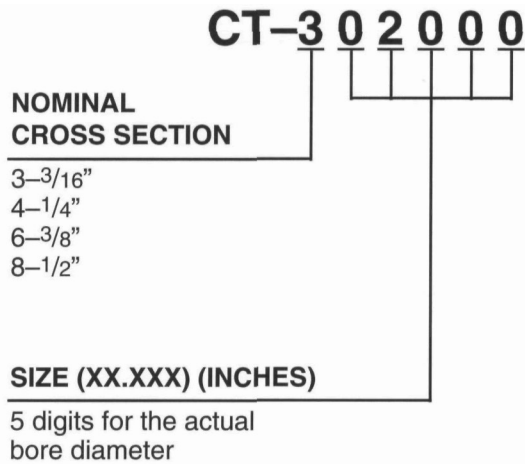
Note: Standard groove dimensions shown above are recommended for new gland designs. Retrofitting requires all gland dimensions be measured, Polyseal Engineering can assist designing for oversize bores etc.

* Recommended for systems up to 6000 PSI. For pressures higher than 6000 PSI consult Macrotech/Polyseal Engineering.



Capped T-Seal

STANDARD INDUSTRIAL CAPPED T-SEAL NUMBERING SYSTEM



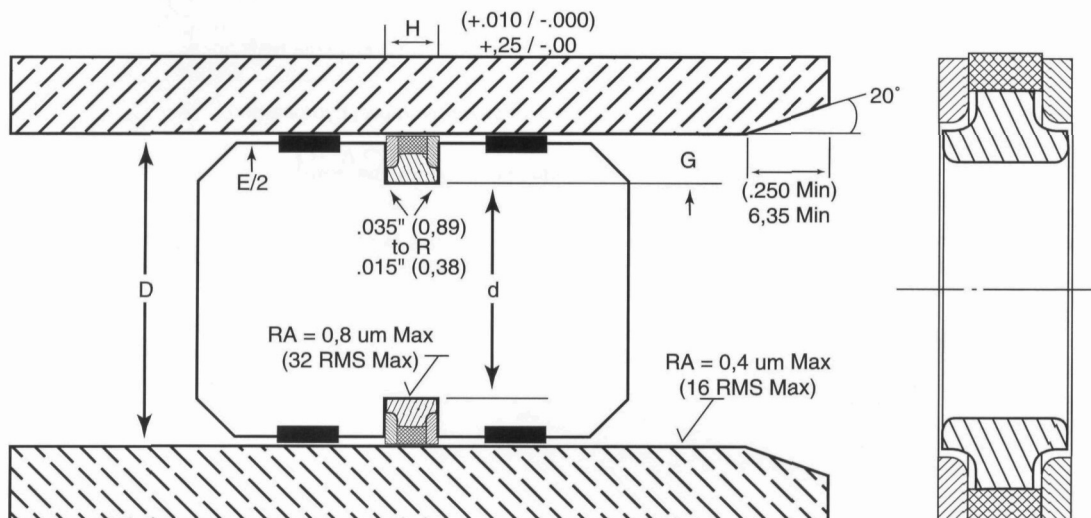
RECOMMENDED GLAND DIMENSIONS STANDARD INDUSTRIAL AND METRIC CAPPED T-SEALS

"D" BORE DIAMETER (INCHES) MM	BORE TOLERANCE (INCHES) MM	"d" GROOVE DIAMETER (INCHES) MM	GROOVE Ø TOLERANCE (INCHES) MM	"H" GROOVE WIDTH (INCHES) MM	"G" GROOVE DEPTH (INCHES) MM	CAPPED T-SEAL C/S (INCHES) MM	E* DIAMETRICAL CLEARANCE
(1.000-2.875) 25 - 74 MM	(+.002/-0.000) +0,05/-0,0	(0"D"-.374) 0"D"-10,0	(+.000/-0.002) +0,07-0,5	(.424) 8,0	(.187) 5,0	(3) A	(.025 MAX) ,64 MAX
(3.000 - 4.875) 75 -124 MM	(+.003/-0.000) +0,087-0,0	(0"D"-.480) 0"D"-15,0	(+.000/-0.003) +0,07-0,8	(.579) 12,0	(.240) 7,5	(4) B	(.030 MAX) ,76 MAX
(5.000-16.000) 125 -405 MM	(+.004/-0.000) +0,107-0,0	(0"D"-.730) 0"D"-20,0	(+.000/-0.004) +0,07-0,10	(.750) 16,0	(.365) 10,0	(6) C	(.035 MAX) ,89 MAX
(16.125-22.000) 406 - 560 MM	(+.0057/-0.000) +0,137-0,0	(0"D"-.940) 0"D"-25,0	(+.000/-0.005) +0,07-0,13	(.750) 20,0	(.470) 12,5	(8) D	(.035 MAX) ,89 MAX

MIL-G-5514 CAPPED T-SEALS. Refer to MIL-G-5514F Piston Seal groove standards.

Note: Standard groove dimensions shown above are recommended for new gland designs. Retrofitting requires all gland dimensions be measured, Polyseal Engineering can assist designing for oversize bores etc.

* Recommended for systems up to 6000 PSI. For pressures higher than 6000 PSI consult Macrotech/Polyseal Engineering.



Capped T-Seal

MATERIALS INFORMATION

CAP RINGS

PTFE COMPOUNDS		TEMP. RANGE* (°F)	TYPICAL SERVICE
702	15% glass 5% moly	-100 to +450	General purpose hydraulic, hydrocarbon and water.
711	25% carbon graphite		High pressure hydraulic, hydrocarbon and water. Low friction.
714	55% bronze 5% moly		High speed, pressure and abrasion resistance.
741	40% bronze		High speed with improved scalability.
771	CaO SiO ₂ MoS ₂		Long wear, General Purpose

PTFE is inert to most fluids, however the fillers may be affected by certain fluids. If suitability is in doubt, please contact Polyseal Engineering Dept..

ENERGIZERS

ELASTOMERS			TEMP. RANGE* (T)	TYPICAL SERVICE
A-8501	NBR nitrile	70A duro	-35 + 265T	General purpose hydraulic and hydrocarbon fluid service.
A-8504	NBR nitrile	70A duro	-65 + 240T	Low temperature hydraulic fluid service.
A-7501	FKM fluoroelastomer	70A duro	-20 + 400T	High temperature and harsh media applications: hydrocarbons and di-esters.

ANTI-EXTRUSION RINGS

PLASTICS		TEMP. RANGE* (T)	TYPICAL SERVICE
703	PTFE PPS filled	-100 +450° F	Extended temperature and media resistance.
707	POLYAMIDE	-40 + 225T	General purpose hydraulic, hydrocarbon service.
745	PEEK virgin	-40 + 450° F	Extended temperature, pressure and media resistance.

*Temperature ranges shown are limited by the functional range of the CT assembly. Materials shown may have different operating ranges when used in other seal designs. The information contained herein is based on laboratory test believed to be reliable. It is offered for comparison and guidance to persons who will conduct their own test in order to determine suitability for any purpose.

NOTE: Macrotech/Polyseal has been a leader in designing seals for most hydraulic applications. The Engineering department should be contacted for design criteria if your application exceeds the limits of the above materials.