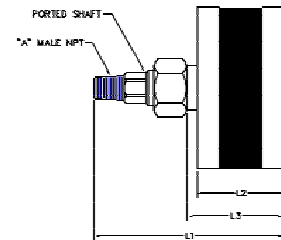
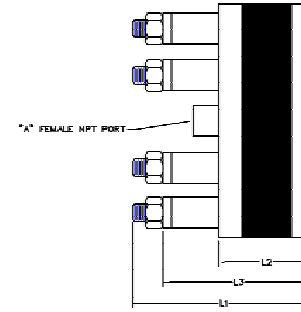


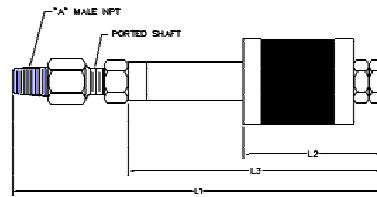
Bolt Type Test Plug - Technical Specifications



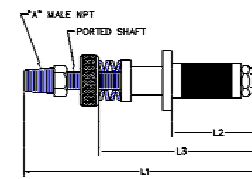
2.17 – 8.50



8.51 – 10.50



.500 – 2.169



.280 – .499

Tube ID Range		Shaft OD		Shaft Quantities	Shaft/Port Diameter		"A" NPT Size	L1		L2		L3		Max. Op. Pressure		Shaft Hex Wrench Size	Hex Nut Wrench Size	Approximate Shipping Weight					
(in)	(mm)	(in)	(mm)		(in)	(mm)		(in)	(mm)	(in)	(mm)	(in)	(mm)	(psi)	(bar)	(in)	(in)	(lbs)	(kgs)				
280 - 499	7.11 - 12.69	1/4-1/8 (STEPPED)	6.4 - 3.2	1	0.06	1.5	1/8 M	4	1/4	108.0	1	1/8	28.6	2	3/8	60.3	250	17.2	9/16	Knurled nut	0.30	0.14	
500 - 719	12.70 - 18.27	1/4	6.4	1	0.12	3.0	1/8 M	4	3/8	111.1	1	3/4	44.5	2	3/4	69.9	250	17.2	9/16	7/16	0.25	0.11	
720 - 869	18.28 - 22.08	1/4	6.4	1	0.12	3.0	1/8 M	4	3/8	111.1	1	3/4	44.5	2	3/4	69.9	175	12.0	9/16	7/16	0.25	0.11	
870 - 1,099	22.09 - 27.69	3/8	9.5	1	0.19	4.8	1/8 M	6	3/8	161.9	2	1/16	52.4	4	7/16	112.7	175	12.0	9/16	9/16	0.50	0.23	
1,100 - 1,429	27.94 - 36.31	3/8	9.5	1	0.19	4.8	1/8 M	6	3/8	161.9	2	3/16	55.6	4	9/16	115.9	175	12.0	9/16	9/16	0.60	0.27	
1,430 - 1,779	36.32 - 45.20	3/8	9.5	1	0.19	4.8	1/8 M	6	3/8	161.9	2	3/16	55.6	4	9/16	115.9	75	5.1	9/16	9/16	0.80	0.36	
1,780 - 2,169	45.21 - 55.11	3/8	9.5	1	0.19	4.8	1/8 M	6	3/8	161.9	2	5/16	58.7	4	11/16	119.1	75	5.1	9/16	9/16	1.00	0.45	
2,17-3.50	55.12 - 89.14	5/8	15.9	1	0.31	7.9	1/4 M	4	3/8	111.1	1	3/4	44.5	2		50.8	50	3.4	1/2	15/16	2.75	1.25	
3.51 - 4.50	89.15 - 114.54	7/8	22.2	1	0.44	11.2	3/8 M	4	5/8	117.5	1	3/4	44.5	2		50.8	40	2.7	11/16	1	5/16	4.50	2.04
4.51-6.50	114.55 - 165.34	1 1/4	31.8	1	0.56	14.2	1/2 M	6	3/4	171.5	3		76.2	3	1/4	82.6	25	1.7	1		1 7/8	13.00	5.89
6.51-8.50	165.35 - 216.14	1 1/2	38.1	1	0.75	19.1	3/4 M	7	3/8	187.3	3	1/2	88.9	3	3/4	95.3	15	1.0	1 1/4		2 1/4	28.50	12.91
8.51-10.50	216.15 - 266.95	5/8	15.9	6	0.75	19.1	3/4 F	6	1/8	155.6	2	1/2	63.5	4	7/8	123.8	10	0.7	n/a		15/16	40.00	18.12

OPERATING PROCEDURES FOR BOLT TYPE TEST PLUGS**WARNINGS!**

- ♦ **PRESSURE TESTING IS INHERENTLY DANGEROUS. STRICT ADHERENCE TO THESE OPERATION INSTRUCTIONS AND INDUSTRY SAFETY PRACTICES COULD PREVENT INJURY TO PERSONNEL**
- ♦ **ALL PERSONNEL MUST BE CLEAR OF TEST PLUG WHEN PRESSURE TESTING**
- ♦ **FOR SAFETY, AN INCOMPRESSIBLE LIQUID SUCH AS WATER SHOULD BE USED AS THE TEST MEDIUM.**
- ♦ **RESIDUAL AIR OR GAS IS TO BE EVACUATED FROM THE PIPE PRIOR TO TESTING.**

1. **The pipe to be tested must have an ID within the variance listed in Table.** Position the test plug in a clean, lubricant free pipe end so that the whole seal is within the pipe.
2. Center the plug within the pipe while hand tightening the hex nut(s). For 0.280" - 0.499" (7.11 – 12.67mm) sizes, firmly tighten the knurled nut by hand until spring washers are flat and fully deflected.

WARNING! CONTINUED TIGHTENING OF KNURLED NUT AFTER SPRING WASHERS ARE FULLY COMPRESSED MAY RESULT IN DAMAGE TO THE PLUG.

On multi-shaft plugs used horizontally, tightening the bottom hex nuts first will aid in centering the plug. The hex nuts on plugs with multiple shafts must be tightened in star pattern.

3. Tighten the hex nut(s) to the installation torque specified in Table. Use of a calibrated torque wrench is recommended.

WARNING! FAILURE TO APPLY THE INSTALLATION TORQUE SPECIFIED IN TABLE 1 COULD RESULT IN UNSAFE OPERATION OR LEAKAGE.

4. Install the pressure source or vent to the plug, leak tight. For plugs not being used to pressurize or vent the system, install a pipe cap or pipe plug, leak tight.
5. Fill the pipe with test medium while evacuating any residual air or gas. Slowly introduce the test pressure. The test pressure must never exceed the maximum test pressure listed in Table.
6. As pressure increases, movement of plug as large as 0.10" (2.5mm) may be detected. Should movement of the shaft or plug exceed .10", release **ALL** pressure immediately, remove plug, examine, reinstall and begin testing in accordance with this operating procedure. Should movement of the shaft or plug during the test still exceed 0.10" (2.5mm), contact the factory for technical assistance.
7. At the conclusion of the test, release **ALL** pressure, loosen the hex nut(s), remove and inspect plug. Any plug component that is worn or damaged must be replaced before attempting further testing. Contact factory for replacement part information.
8. Prior to storing, dry all parts of the plug and lubricate the shaft threads and hardened steel washer(s) with antiseize. Store these instructions with the plug.

PIPE OR TUBE ID RANGE		❖ INSTALLATION TORQUE		♦ MAX. TEST PRESSURE		ACCEPTABLE TUBE/PIPE ID VARIANCE FROM NOMINAL	
(in)	(mm)	(ft-lbs)	as listed	(psi)	(Bar)	under	over
0.280" - 0.499"	7.11 – 12.68	Refer to step 2		250	17	0.02" (.5mm)	0.03" (.8mm)
0.500" - 0.719"	12.69 – 18.27	3.3	4.5 N-m	250	17	0.02" (.5mm)	0.03" (.8mm)
0.720" - 0.869"	18.28 – 22.08	3.3	4.5 N-m	175	12	0.02" (.5mm)	0.03" (.8mm)
0.870" - 1.429"	22.09 – 36.30	14	19.0 N-m	175	12	0.02" (.5mm)	0.03" (.8mm)
1.430" - 2.169"	36.31 – 55.10	14	19.0 N-m	75	5	0.02" (.5mm)	0.03" (.8mm)
2.17" - 3.50"	55.11 – 89.0	30	40.7 N-m	50	3.4	0.04" (1.0mm)	0.06" (1.5mm)
3.51" - 4.00"	89.1 - 101.7	45	61.0 N-m	40	2.7	0.04" (1.0mm)	0.06" (1.5mm)
4.01" - 4.50"	101.8 - 114.4	45	61.0 N-m	40	2.7	0.05" (1.3mm)	0.06" (1.5mm)
4.51" - 6.00"	114.5 - 152.5	100	135.6 N-m	25	1.7	0.05" (1.3mm)	0.06" (1.5mm)
6.01" - 6.50"	152.6 - 165.2	100	135.6 N-m	25	1.7	0.05" (1.3mm)	0.06" (1.5mm)
6.51" - 8.00"	165.3 - 203.3	100	135.6 N-m	15	1.0	0.05" (1.3mm)	0.06" (1.5mm)
8.01" - 8.50"	203.4 - 216.0	100	135.6 N-m	15	1.0	0.06" (1.5mm)	0.08" (2.0mm)
8.51" - 10.50"	216.1 - 266.8	25	33.9 N-m	10	.7	0.06" (1.5mm)	0.08" (2.0mm)

Specifications subject to change without notice.

- ❖ **INSTALLATION TORQUES ARE FOR STANDARD NEOPRENE SEALS, DO NOT EXCEED VALUES BY MORE THAN 5%**
- ♦ **MAXIMUM TEST PRESSURES HAVE BEEN DETERMINED FROM TESTS PERFORMED IN CLEAN, DRY CARBON STEEL PIPE**



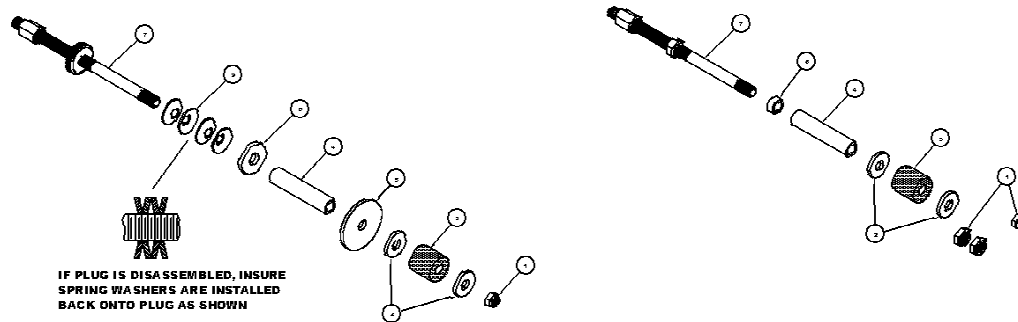
World Headquarters:
Expansion Seal Technologies
 2701 Township Line Road
 Hatfield, PA 19440-1770 USA
 Tel: 1-215-721-1100 Fax: 1-215-721-1101
 Toll-Free: 1-800-355-7044

Expansion Seal Technologies EMEA
 Hoorn 312a • 2404 HL Alphen aan den Rijn
 The Netherlands
 Tel: +31-172-418841
 Fax: +31-172-418849

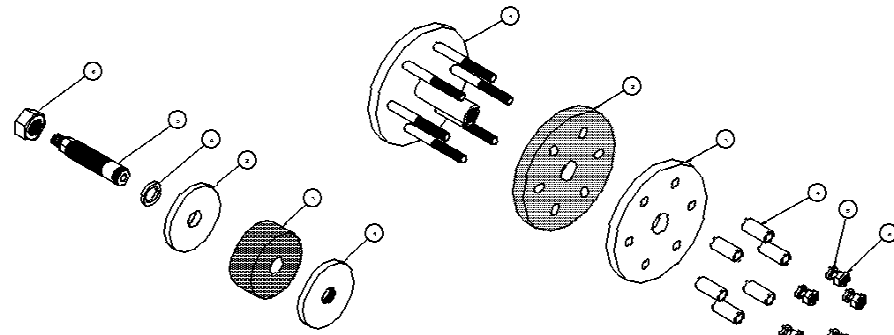
Expansion Seal Technologies Asia Pte Ltd.
 35 Tannery Rd, #11-10 Tannery Block
 Ruby Industrial Complex
 Singapore 347740
 Tel: +65-6745-8560 Fax: +65-6742-8700

TYPE 1 & 2**RANGE: 0.280 – 2.169**

ITEM	QTY	DESCRIPTION
1	1	LOCKNUT (0.280 - 0.869)
	2	JAMNUT (0.870 - 2.169)
2	2	COMPRESSION WASHER
3	1	SEAL- STANDARD NEOPRENE BTT-XXXX-NRS
4	1	COMPRESSION TUBE
5	1	POSITIONING WASHER (0.280 - 0.499)
6	1	HARDENED WASHER (0.870 - 2.169)
7	1	SHAFT ASSEMBLY INCLUDES KNURLED NUT (0.280 - 0.869)
		INCLUDES HEXNUT (0.870— 2.169)
8	1	SPACER WASHER (0.280 - 0.499)
9	4	SPRING WASHER (.280 – 0.499)

**TYPE 1 (0.280 - 0.499)****TYPE 2 (0.500 - 2.169)****TYPE 3****RANGE: 2.17 – 8.50**

ITEM	QTY	DESCRIPTION
1	1	BTM COMPRESSION WASHER
2	1	TOP COMPRESSION WASHER
3	1	SEAL – STANDARD NEOPRENE BTT-XXXX-NRS
4	1	HARDENED WASHER
5	1	SHAFT
6	1	HEXNUT

**TYPE 3 (2.1700 - 8.50)****TYPE 4 (8.51 - 10.50)****TYPE 4****RANGE: 8.51 – 10.50**

ITEM	QTY	DESCRIPTION
1	1	COMPRESSION WASHER & SHAFT ASSEMBLY
2	1	SEAL – STANDARD NEOPRENE BTT-XXXX-NRS
3	1	COMPRESSION WASHER
4	6	COMPRESSION TUBE
5	6	HARDENED WASHER
6	6	HEXNUT

QUESTIONS? Contact EST Customer Service at any of the following locations with questions.In USA and Canada: tel: 800-355-7044, fax: 215-721-1101, e-mail: info@expansionseal.comIn Europe: tel: +31-172-418841, fax: +31-172-418849; e-mail: info@estgrp.nlIn Asia: tel: +65-6745-8560, fax: +65-6742-8700, e-mail: estasia@singnet.com.sgOn the Internet: www.expansionseal.com

Expansion Seal Technologies is part of the EST Group of companies. **EST Group** provides a complete range of repair products, services and replacement parts covering the life cycle of tubular heat exchangers and condensers; additionally EST provides products and services to facilitate pressure testing pipe, piping systems, pressure vessels and their components. Visit EST Group on the internet at www.estgrp.com.



World Headquarters:
Expansion Seal Technologies
 2701 Township Line Road
 Hatfield, PA 19440-1770 USA
 Tel: 1-215-721-1100 Fax: 1-215-721-1101
 Toll-Free: 1-800-355-7044

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 Hoorn 312a • 2404 HL Alphen aan den Rijn
 The Netherlands
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 Fax: +31-172 - 418849

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 Ruby Industrial Complex
 Singapore 347740
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Bolt Type Medium Pressure Test Plugs



Bolt Type Test Plugs

Auto GripTight™ Systems

High Lift Flange Test Plugs

Hydrostatic Test Pumps

OD GripTight Plugs

GripTight Test Plugs



For Simple, Reliable Testing Without Tube Wall Damage

EST's Bolt Type Medium Pressure Test Plugs are designed for simple, reliable testing of pipe and tubing to 250 psig (17.2 bar), without the tube wall damage associated with other test plugs. That's because our Bolt Type plugs feature a neoprene seal — the only part of the plug that comes into contact with the tube ID. To use, simply install into the open end of the pipe or tube and tighten the large compression nut to expand the seal element. Then begin testing.

With the Bolt Type Medium Pressure Test Plugs, you get the following features:

- **Heavy duty construction:** Plated carbon steel or equivalent coating with neoprene seal elements.
- **Versatile:** Wide range of available sizes. Tube ID range from .280" to 10.50" (7.1 - 266.7 mm). Consult factory for larger sizes or special configurations.
- **Brass anti-gall washer and thread lubricant:** Protects threads and facilitates test plug installation and removal.
- **Long wearing full disk seals:** Extend plug life.
- **Easy to maintain:** Replacement seals readily available.
- **Available in Super Stock:** For same or next day delivery.
- **Optional construction:** 300 Series Stainless Steel. Seals available in silicone or Viton.

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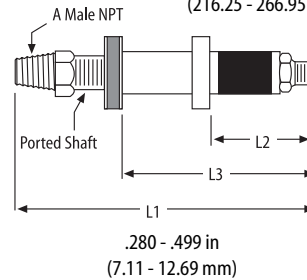
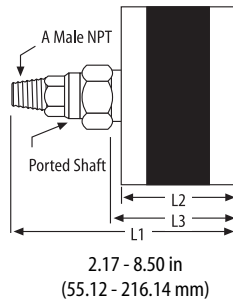
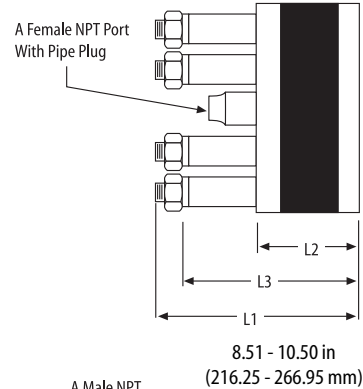
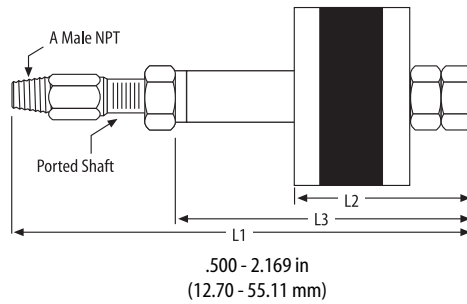
Expansion Seal Technologies EMEA
Hoorn 312a • 2404 HL Alphen aan den Rijn
The Netherlands
Tel: +31-172-418841
Fax: +31-172 - 418849

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35 Tannery Rd, #11-10 Tannery Block
Ruby Industrial Complex
Singapore 347740
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Dimensions and Ordering Information



Tube ID Range in/mm	Shaft OD in/mm	Shaft Quantities	Shaft/Port Dia in/mm	"A" Connection NPT	L1 in/mm	L2 in/mm	L3 in/mm	Max Operating Pressure* Psig / bar	Shaft Hex Wrench Size	Hex Nut Wrench Size	Approx. Shipping Weight lbs/kg
.280 - .499 7.11 mm - 12.69 mm	1/4-1/8 (STEPPED) 6.4 mm - 3.2 mm	1	1/16 1.5 mm	1/8 M	4 101.6 mm	1-1/8 28.6 mm	2-1/4 57.2 mm	250 17.2 bar	9/16	Knurled nut	.30 .14 kg
.500 - .719 12.70 mm - 18.27 mm	1/4 6.4 mm	1	1/8 3.0 mm	1/8 M	4-3/8 111.1 mm	1-3/4 44.5 mm	2-3/4 69.9 mm	250 17.2 bar	9/16	7/16	.25 .11 kg
.720 - .869 18.28 mm - 22.08 mm	1/4 6.4 mm	1	1/8 3.0 mm	1/8 M	4-3/8 111.1 mm	1-3/4 44.5 mm	2-3/4 69.9 mm	175 12.0 bar	9/16	7/16	.25 .11 kg
.870 - 1.099 22.09 mm - 27.69 mm	3/8 9.5 mm	1	3/16 4.8 mm	1/8 M	6-3/8 161.9 mm	2-1/16 52.4 mm	4-7/16 112.7 mm	175 12.0 bar	9/16	9/16	.50 .23 kg
1.100 - 1.429 27.94 mm - 36.31 mm	3/8 9.5 mm	1	3/16 4.8 mm	1/8 M	6-3/8 161.9 mm	2-3/16 55.6 mm	4-9/16 115.9 mm	175 12.0 bar	9/16	9/16	.60 .27 kg
1.430 - 1.779 36.32 mm - 45.20 mm	3/8 9.5 mm	1	3/16 4.8 mm	1/8 M	6-3/8 161.9 mm	2-3/16 55.6 mm	4-9/16 115.9 mm	75 5.1 bar	9/16	9/16	.80 .36 kg
1.780 - 2.169 45.21 mm - 55.11 mm	3/8 9.5 mm	1	3/16 4.8 mm	1/8 M	6-3/8 161.9 mm	2-5/16 58.7 mm	4-11/16 119.1 mm	75 5.1 bar	9/16	9/16	1 .45 kg
2.17 - 3.50 55.12 mm - 89.14 mm	5/8 15.9 mm	1	5/16 7.9 mm	1/4 M	4-3/8 111.1 mm	1-3/4 44.5 mm	2 50.8 mm	50 3.4 bar	1/2	15/16	2.75 1.25 kg
3.51 - 4.50 89.15 mm - 114.54 mm	7/8 22.2 mm	1	7/16 11.2 mm	3/8 M	4-5/8 117.5 mm	1-3/4 44.5 mm	2 50.8 mm	40 2.7 bar	11/16	1-5/16	4.50 2.04 kg
4.51-6.50 114.55 mm - 165.34 mm	1-1/4 31.8 mm	1	9/16 14.2 mm	1/2 M	6-3/4 171.5 mm	3 76.2 mm	3-1/4 82.6 mm	25 1.7 bar	1	1-7/8	13 5.89 kg
6.51-8.50 165.35 mm - 216.14 mm	1-1/2 38.1 mm	1	3/4 19.1 mm	3/4 M	7-3/8 187.3 mm	3-1/2 88.9 mm	3-3/4 95.3 mm	15 1.0 bar	1-1/4	2-1/4	28.50 12.91 kg
8.51-10.50 216.15 mm - 266.95 mm	5/8 15.9 mm	1	3/4 19.1 mm	3/4 F	6-1/8 155.6 mm	2-1/2 63.5 mm	4-7/8 123.8 mm	10 .7 bar	n/a	15/16	40 18.12 kg

Note: One plug does not cover full range listed; this is for pressure only. Each plug is cut to fit the application ID and expands approximately .06".

Specifications subject to change. When ordering, specify tube or pipe ID, or OD and wall thickness or schedule, desired maximum test pressure and temperature. EST will provide actual part number and pricing. Many standard sizes in stock for same or next day shipment. Maximum operating pressure is based on installation into a clean, lubricant-free and dry pipe.



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