



DOWTY SEALS

Literature



Introduction:



Figure 1 Dowty Seals

There would be a tendency for fluid leakage in pipe or tube connections if the connection were metal to metal. Leakages can have grave repercussions in any system. They cause wastage of resources; they also tremendously affect the system's working temperature and pressure. It goes without mentioning that exposure to the fluid can be environmentally harmful. This explains the need for seals at connection points.

Seals are generally used to prevent leakage in a system, and depending on the application, they may be of various types. Examples of seals include gaskets, O-rings, face seals, lip seals, and of course, dowty seals (also called bonded seals). Dowty seals provide a tight end to end connection in pipeline systems. They are ring-shaped made of both metal and elastomer material.

Materials:

As mentioned earlier, dowty seals are made of 2 materials, a metal, and an elastomer material. The metal is typically steel, while the elastomer is NBR (nitrile rubber). Note that the metal could also be made of stainless steel SS316, SS304, aluminum, brass, etc., depending on its application.

NBR, on the other hand, is a popular kind of rubber made of butadiene and acrylonitrile. Their wide popularity can be attributed to their resistance to chemical, fuel, and oil. Refer to the table below for the properties of NBR.

Property	Value
Density	It can be compounded around 1.00 g/cm ³
Tensile failure stress, ultimate	500 - 2500 PSI
Hardness (Shore A)	30 - 90
Elongation after fracture in 1%	600% Maximum

Benefits of Dowty Seals:

Dowty seals are advantageous during pipe and tube installation. Specifically, these are some of the reasons you should get dowty seals as per below:

- Dowty seals are flexible. Hence they can fit in a variety of devices.
- They can be used for high pressure and low-pressure systems.
- They are cost-effective accessories for securing connections during installation
- The rubber and metal combination prevents over-compression and extrusion
- It is a safe and secure way of avoiding overfitting.

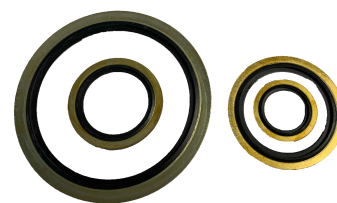
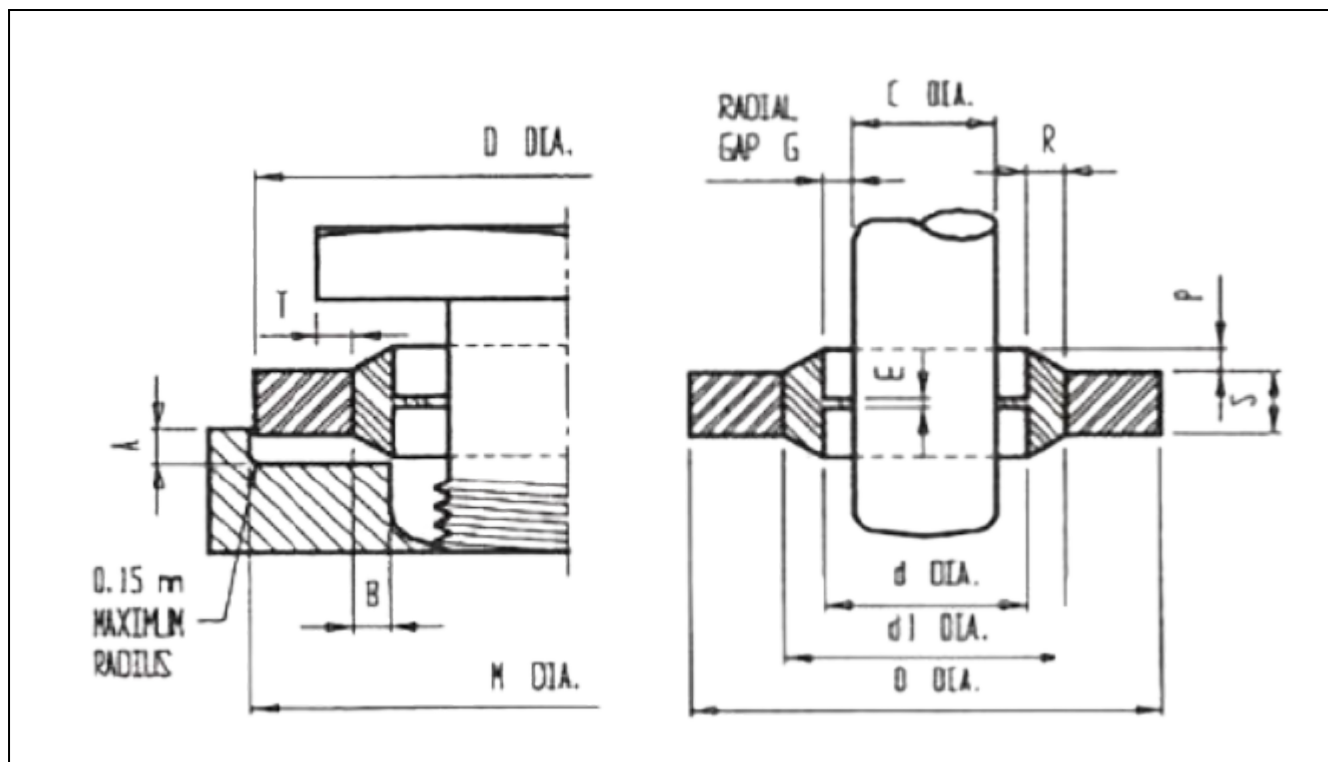


Figure 2 Dowty Seals

Sizes of Dowty Seals:

Dowty seals are made in different sizes and designed to work at different temperatures. The table below shows the dimensions of varying dowty seals and their working temperature.



The table below is a tube and hose selection chart for nozzle and projectiles.

The table below is a selection chart for metallic pipes.

Thread Inches Size	Size Reference	d +/- 0.13	C Centralizing Lip	E +/- 0.05	P +/- 0.13	R +/- 0.10	d1 +/- 0.10	D +0.13	S +/- 0.10
1/8 BSP	820	10.37	8.26 (+0.25/-0)	0.35	0.38	0.20	11.84	15.88	2.00
1/4 BSP	821	13.74	11.18 (+0.25/-0)	0.35	0.38	0.20	15.21	20.57	2.00
3/8 BSP	823	17.28	14.76 (+0.25/-0)	0.35	0.38	0.20	18.75	23.80	2.00
1/2 BSP	825	21.54	18.24 (+0.25/-0)	0.35	0.38	0.20	23.01	28.58	2.50
5/8 BSP	826	23.49	20.27 (+0.25/-0)	0.35	0.38	0.20	24.97	31.75	2.50

3/4 BSP	827	27.05	23.83 (+0.25/-0)	0.35	0.38	0.20	28.53	34.93	2.50
7/8 BSP	829	30.81	27.51 (+0.25/-0)	0.35	0.38	0.20	32.29	38.10	2.50
1 BSP	830	33.89	29.92 (+0.25/-0)	0.35	0.38	0.20	36.88	42.80	3.20
1 1/4 BSP	832	42.93	38.45 (+0.25/-0)	0.35	0.38	0.20	45.93	52.38	3.20
1 1/2 BSP	833	48.44	44.45 (+0.25/-0)	0.35	0.38	0.20	51.39	58.60	3.20
1 3/4 BSP	834	54.89	50.42 (+0.25/-0)	0.35	0.38	0.20	58.30	69.85	3.20
2 BSP	836	60.58	56.26 (+0.25/-0)	0.35	0.38	0.20	63.63	73.03	3.20
2 1/4 BSP	838	66.68	62.36 (+0.25/-0)	0.35	0.38	0.20	69.98	79.50	3.20
2 1/2 BSP	839	76.08	71.50 (+0.25/-0)	0.35	0.38	0.20	79.38	90.17	3.20

Thread Inches Size	Size Reference	d +/- 0.13	C Centralizin g Lip	E +/- 0.05	P +/- 0.13	R +/- 0.10	d1 +/- 0.10	D +0.13	S +/- 0.10
M8	866	8.70	6.40 (+0.25/-0)	0.35	0.38	0.20	10.40	14.00	1.00
M10	708	10.70	8.05 (+0.25/-0)	0.35	0.38	0.20	12.40	16.08	1.50
M12	867	12.70	9.73 (+0.25/-0)	0.35	0.38	0.20	14.10	19.00	1.50
M14	868	14.70	11.39 (+0.25/-0)	0.35	0.38	0.20	16.40	22.00	1.50
M16	870	16.70	13.41 (+0.25/-0)	0.35	0.38	0.20	18.40	24.00	1.50
M18	872	18.70	14.76 (+0.25/-0)	0.35	0.38	0.20	20.40	26.00	1.50
M20	873	20.70	16.76 (+0.25/-0)	0.35	0.38	0.20	22.50	28.00	1.50

M22	874	22.70	18.74 (+0.25/-0)	0.35	0.38	0.20	24.40	30.00	2.00
M24	875	24.70	20.11 (+0.25/-0)	0.35	0.38	0.20	26.40	32.00	2.00

Torque value for the Dowty Seals:

The summary of torque values for dowty seals as shown below:

Thread Size (Metric)	Thread Size (Imperial)	Thread Size (BSP)	Torque Required (lbs.in)	Torque Required (Nm)
Up to 8	5/16	-	47	5.3
10	3/8	1/8	63	7.1
11	7/16	-	105	11.8
12	1/2	1/4	140	15.8
14	9/16	.60 x 19	200	22.6
16	5/8	3/8	270	30.5
18	3/4	0.75 x 14	360	40.7
20	.825	1/2	500	56.5
22	7/8	5/8	600	67.8
24	1	-	650	73.4
27 and above	1.041	3/4	700	79

Chuan Kok Hardware & Machinery Pte Ltd

Address : 1783 Geylang Bahru, #01-02, Singapore 339708
Telephone Number : +65 6294 2566
Email Address : info@chuankok.com
Website : www.chuankok.com
Business Registration Number : 198201577Z
Country of Registration : Singapore

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