

Clamp Seals and DIN 11864 O-Rings for Hygienic Design Couplings

for Food, Beverage
and Pharmaceutical
Industries



Your Partner for Sealing Technology



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Trelleborg Sealing Solutions is a major international sealing force, uniquely placed to offer dedicated design and development from our market-leading product and material portfolio: a one-stop-shop providing the best in elastomer, thermoplastic, PTFE and composite technologies for applications in aerospace, industrial and automotive industries.

With 50 years of experience, Trelleborg Sealing Solutions engineers support customers with design, prototyping, production, test and installation using state-of-the-art design tools. An international network of over 70 facilities worldwide includes over 25 manufacturing sites, strategically-positioned research and development centers, including materials and development laboratories and locations specializing in design and applications.

Developing and formulating materials in-house, we utilize the resource of our material database, including over 2,000 proprietary compounds and a range of unique products.

Trelleborg Sealing Solutions fulfills challenging service requirements, supplying standard parts in volume or a single custom-manufactured component, through our integrated logistical support, which effectively delivers over 40,000 sealing products to customers worldwide.

Facilities are certified to ISO 9001:2008 and ISO/TS 16949:2009. Trelleborg Sealing Solutions is backed by the experiences and resources of one of the world's foremost experts in polymer technology: the Trelleborg Group.

ISO 9001:2008

ISO/TS 16949:2009

The information in this brochure is intended to be for general reference purposes only and is not intended to be a specific recommendation for any individual application. The application limits for pressure, temperature, speed and media given are maximum values determined in laboratory conditions. In application, due to the interaction of operating parameters, maximum values may not be achieved. It is vital therefore, that customers satisfy themselves as to the suitability of product and material for each of their individual applications. Any reliance on information is therefore at the user's own risk. In no event will Trelleborg Sealing Solutions be liable for any loss, damage, claim or expense directly or indirectly arising or resulting from the use of any information provided in this brochure. While every effort is made to ensure the accuracy of information contained herewith, Trelleborg Sealing Solutions cannot warrant the accuracy or completeness of information.

To obtain the best recommendation for a specific application, please contact your local Trelleborg Sealing Solutions marketing company.

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Clamp Seals and O-Rings for Hygienic Design Couplings

■ Introduction

Filling equipment, processing and packaging machines consist of many parts that have to be connected together.

Especially in Food, Beverage and Pharmaceutical plants, along with those in Bioprocessing, a hygienic design of these connections is imperative. Only with hygienic design, proper cleaning, usually Cleaning-in-Place (CIP) followed by successful Sterilization-in-Place (SIP) is achievable.

Trelleborg Sealing Solutions offers gaskets and O-Rings for the most common standards like ISO 2852, DIN 11864, ASME BPE and DIN 32676 in high-quality materials with compliance to European Regulation (EC) 1935/2004, FDA, USP Class VI and 3-A sanitary standards.

These materials have been tested against the most commonly used cleaning fluids such as acids, alkalines and solutions with active oxygen. They have also been tested in hot water and steam with different types of water, including Ultra pure deionized (UPDI) water.

Trelleborg Sealing Solutions can also provide a range of sanitary gaskets to ASME BPE standard in inch sizes. Besides the standard flanged and non-flanged versions, special designs like screen gaskets or validation gaskets can be supplied.

If elastomer seals are unsuitable for a specific application then PTFE/EPDM Bonded Envelope or PTFE/Stainless Steel are available. Please contact your local Trelleborg Sealing Solutions marketing company.

Clamp Seals and O-Rings for Hygienic Design Couplings

Materials

EPDM E7502 – Performance beyond the standard

Trelleborg Sealing Solutions has maximized the usability of Ethylene Propylene Diene Rubber (EPDM) in processing applications.

Compound E7502 has high chemical resistance, giving it long life in polar solvents, steam and hot water along with suitability for contact with alkaline cleaning fluids. Tests prove it to be the best choice in liquid dairy applications and with Water-for-Injection (WFI) at high temperatures.

Peroxide-cured, E7502 contains the smallest amount of softeners and process aids possible. This reduces potential leach out to a minimum, lowering the risk of contamination. It is engineered to achieve enhanced chemical and thermal stability.

FKM V8605 – The classic Fluorocarbon compound

FKM V8605 is specially suited to processes with high temperatures or where there is contact with high-fat media such as edible oils or cosmetics, or in processes where lubrication with grease or mineral-based oils is required. V8605 is proven not only in pipe couplings but also in mechanical seals, decanters, separators or valves.

FKM V8T41 - Outstanding hot water and steam resistance

FKM V8T41 has a sophisticated polymer architecture and is designed for improved hot water and steam resistance up to 170°C/338°F. This makes the material especially suitable for use in heat exchangers or Ultra-High Temperature processing (UHT) equipment. It gives high performance in contact with dry and liquid products in the meat, poultry and dairy industries, as well as in pharmaceutical and bioprocessing equipment.

Compliant to regulations and industry standards

The recommended materials above are all compliant to and tested against Regulation (EC) 1935/2004, FDA, 21 CFR177.2600, 3-A, USP Class VI, as well as against cytotoxicity (USP <87> and DIN EN ISO 10993-5).

Table I Standards

Seal Type	Standard
Clamp Gaskets	DIN 32676, ISO 2852, ASME BPE
O-Rings	DIN 11864

O-Rings are available in almost any standard or custom size.

Table II Recommended materials comply to relevant industry standards

Approvals/Compound	FDA	Regulation (EC) 1935/2004	USP Class VI	Cytotoxicity EN ISO 10993-5	3-A
E7502	✓	✓	✓	✓	✓
V8605	✓	✓	✓	✓	✓
V8T41	✓	✓	✓	✓	✓

All materials are free from ingredients derived from animals.



Figure 1 Pipe coupling according to DIN 32676, ISO 2852



Clamp Seals and O-Rings for Hygienic Design Couplings

■ Gaskets for 32676:2009-05 (Series A) pipe couplings

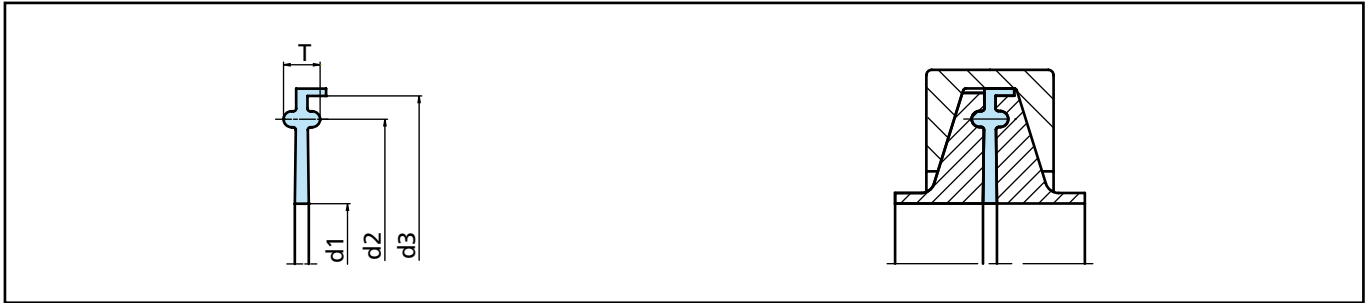


Figure 2 Seal dimensioning and installation

Table III TSS Part Numbers, Installation Dimensions according to DIN 32676

TSS Part No.	Nominal Size DIN [mm]	Ø ID d1 [mm]	Ø Centerline d2 [mm]	Ø OD d3 [mm]	T [mm]
DSDF01000	10	10.20	27.50	34.00	5.5
DSDF01500	15	16.20	27.50	34.00	
DSDF02000	20	20.20	27.50	34.00	
DSDF02500	25	26.20	43.50	50.50	
DSDF03200	32	32.20	43.50	50.50	
DSDF04000	40	38.20	43.50	50.50	
DSDF05000	50	50.20	56.50	64.00	
DSDF06500	65	66.20	83.50	91.00	
DSDF08000	80	81.20	97.00	106.00	
DSDF10000	100	100.20	110.00	119.00	
DSDF12500	125	125.20	146.00	155.00	
DSDF15000	150	150.20	174.00	183.00	
DSDF20000	200	200.20	225.00	233.50	

Clamp seals are not always available from stock in every standard or custom size.



Ordering example

Dimensions: Inner diameter = 10.2 mm
Outer diameter = 34.0 mm
Centerline Ø of
Location groove = 27.5 mm
Material: Ethylene Propylene Diene Rubber E7502

TSS Article No.	DS	D	F	01000	-	E7502
TSS Article Group						
Standard DIN 32676						
F = with flange, C = without flange						
Nominal Size in mm x 100						
Quality Index (Standard)						
Material Code (Standard)						

For clamp seal dimension and Trelleborg Sealing Solutions part numbers see Table III.

Available Materials: EPDM E7502 with 70 Sh A and FKM V8605 with a hardness of 80 Sh A.



Clamp Seals and O-Rings for Hygienic Design Couplings

■ Gaskets for ISO 2852/ASME BPE/DIN 32676:2009 (Series C) pipe couplings

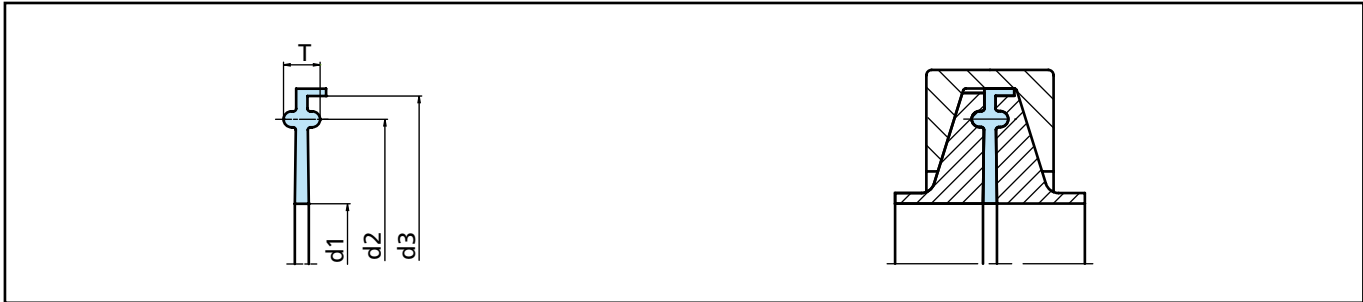


Figure 3 Seal dimensioning and installation

Table IV TSS Part Numbers, Installation Dimensions according to ISO 2852 and DIN 32676:2009-05, pipes according to DIN 11866 (Series C)

TSS Part No.	Nominal Size		Ø ID d1 [mm]	Ø Centerline d2 [mm]	Ø OD d3 [mm]	T [mm]
	ISO	Inch*				
DSMF01200	12		10.20	27.50	34.00	5.5
DSMF01270	12.7		10.90	27.50	34.00	
DSMF01720	17.2		15.40	27.50	34.00	
DSMF02130	21.3		19.50	27.50	34.00	
DSMF02500	25	1"	22.80	43.50	50.50	
DSMF03370	33.7		31.50	43.50	50.50	
DSMF03800	38	1½"	35.80	43.50	50.50	
DSMF04000	40		37.80	56.50	64.00	
DSMF05100	51	2"	48.80	56.50	64.00	
DSMF06350	63.5	2½"	60.50	70.50	77.50	
DSMF07000	70		67.00	83.50	91.00	
DSMF07610	76.1	3"	73.10	83.50	91.00	
DSMF08890	88.9		85.10	97.00	106.00	
DSMF10160	101.6	4"	97.80	110.00	119.00	
DSMF11430	114.3		110.50	122.00	130.00	
DSMF13970	139.7		135.90	146.00	155.00	
DSMF16830	168.3		163.30	174.00	183.00	
DSMF21910	219.1		214.10	225.00	233.50	

Clamp seals are not always available from stock in every standard or custom size.

*Usually compatible with ASME BPE and DIN 32676:2009-05 (Series C).



Ordering example

Dimensions: Inner diameter = 10.2 mm
Outer diameter = 34.0 mm
Centerline Ø of
Location groove = 27.5 mm
Material: Ethylene Propylene Diene Rubber E7502

TSS Article No.	DS	M	F	01200	-	E7502
TSS Article Group						
M = Standard ISO 2852						
F = with flange, C = without flange						
Nominal Size in mm x 100						
Quality Index (Standard)						
Material Code (Standard)						

For clamp seal dimension and Trelleborg Sealing Solutions part numbers see Table IV.

Available Materials: EPDM E7502 with 70 Sh A and FKM V8605 with a hardness of 80 Sh A.



■ Gaskets for mini pipe couplings according to ASME BPE tubes and DIN 32676:2009-05 (Series C)

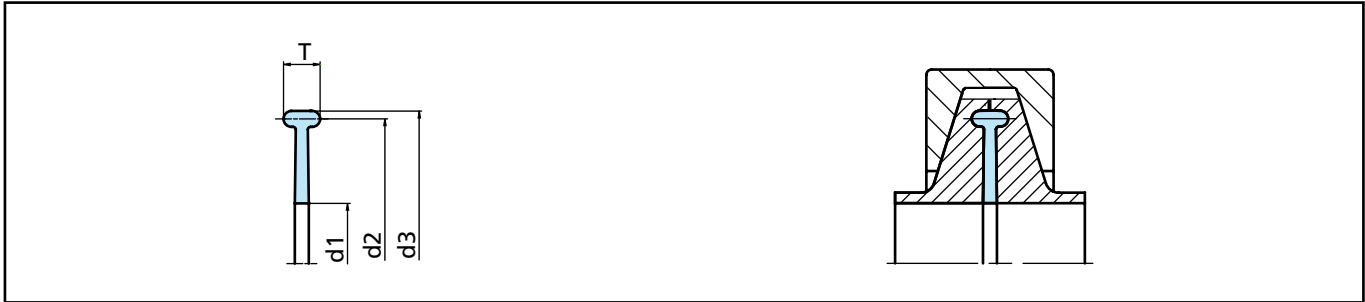


Figure 3 Seal dimensioning and installation

Table V TSS Part Numbers, Installation Dimensions according to ASME BPE/DIN 32676 (series C)

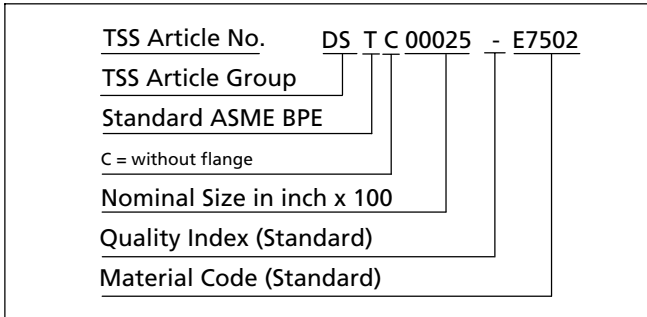
TSS Part No.	Nominal Size Inch	Ø ID d1 [mm]	Ø Centerline to locating groove d2 [mm]	Ø OD d3 [mm]	T [mm]
DSTC00025-	1/4"	4.75	20.20	22.00	4.5
DSTC00038-	3/8"	8.00	20.20	22.00	
DSTC00050-	1/2"	11.30	20.20	22.00	
DSTC00075-	3/4"	16.20	20.20	22.00	

Clamp seals are not always available from stock in every standard or custom size.



Ordering example

Dimensions: Inner diameter = 4.75 mm
Outer diameter = 22.0 mm
Centerline Ø of
Location groove = 20.2 mm
Material: Ethylene Propylene Diene Rubber E7502



For clamp seal dimension and Trelleborg Sealing Solutions part numbers see Table V.

Available Materials: EPDM E7502 with 70 Sh A and FKM V8605 with a hardness of 80 Sh A.



■ O-Rings for DIN 11864 pipe couplings

The following two tables show the different sizes of O-Rings defined for tubing according to DIN 11866, series A and DIN 11866, series C to be used in conjunction with couplings according to DIN 11864.

For more information regarding material properties, quality criteria, storage and shelf life of polymer sealing materials, refer to our O-Ring catalog.

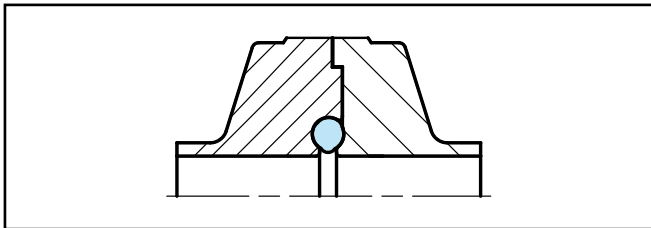


Figure 4 Installation

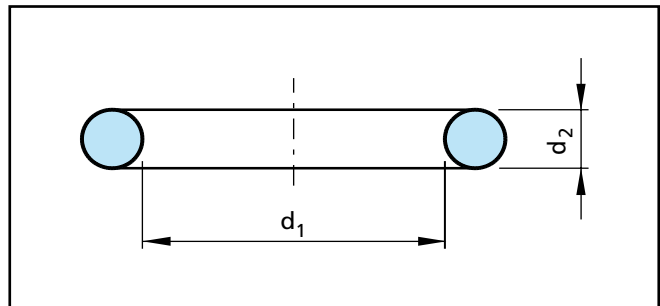


Figure 5 O-Ring dimensions

Table VI TSS Part Numbers, Dimensions for Aseptic O-Ring for tubes according to DIN 11866, series A

TSS Part No.	Nominal diameter DN [mm]	Inner seal diameter d1 [mm]	Cross section diameter d2 [mm]
OR3501200	10	12 ± 0.21	3.5 ± 0.1
OR3501800	15	18 ± 0.25	
OR3502200	20	22 ± 0.28	
OR3502800	25	28 ± 0.32	
OR5003400	32	34 ± 0.37	5 ± 0.13
OR5004000	40	40 ± 0.41	
OR5005200	50	52 ± 0.49	
OR5006800	65	68 ± 0.61	
OR5008300	80	83 ± 0.71	
OR5010200	100	102 ± 0.84	
OR5012700	125	127 ± 1,01	
OR5015200	150	152 ± 1,17	

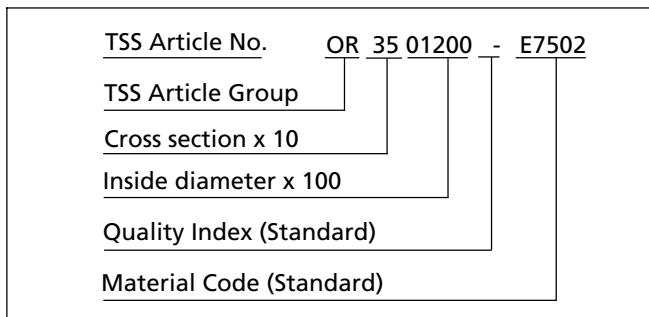


Table VII TSS Part Numbers, Dimensions for Aseptic O-Ring for tubing according to DIN 11866, series C

TSS Part No.	Nominal Diameter DN	Inner seal diameter d1 [mm]	Cross section diameter d2 [mm]
OR3501200	½"	12 ± 0.21	3.5 ± 0.1
OR3501800	¾"	18 ± 0.25	
OR3502400	1"	24 ± 0.29	
OR5003700	1½"	37 ± 0.39	5 ± 0.13
OR5005000	2"	50 ± 0.48	
OR5006200	2½"	62 ± 0.56	
OR5007500	3"	75 ± 0.66	
OR5010000	4"	100 ± 0.83	

Ordering example O-Ring, metric

Dimensions: Inner diameter = 12.0 mm
 Cross section = 3.5 mm
 Material: E7502



For O-Ring dimensions and Trelleborg Sealing Solutions part numbers see Table VI and Table VII.

When a special material is required the exact five-digit Trelleborg Sealing Solutions material code must be given with the order. For this refer to Table II or contact your local Trelleborg Sealings Solutions marketing company.

Contact your local marketing company for further information:

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BELGIUM - Dion-Valmont (LUXEMBOURG)	+32 (0) 10 22 57 50	BRAZIL - São Paulo	+55 11 3372 4500
BULGARIA - Sofia (BELARUS, ROMANIA, TURKEY, UKRAINE)	+359 (0)2 969 95 99	CANADA - Etobicoke, ON	+1 416 213 9444
CROATIA - Zagreb	+385 (0) 1 24 56 387	MEXICO - Mexico City	+52 55 57 19 50 05
CZECH REPUBLIC - Rakovník (SLOVAKIA)	+420 313 529 111	USA, East - Conshohocken, PA	+1 610 828 3209
DENMARK - Copenhagen K	+45 48 22 80 80	USA, Great Lakes - Fort Wayne, IN	+1 260 482 4050
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