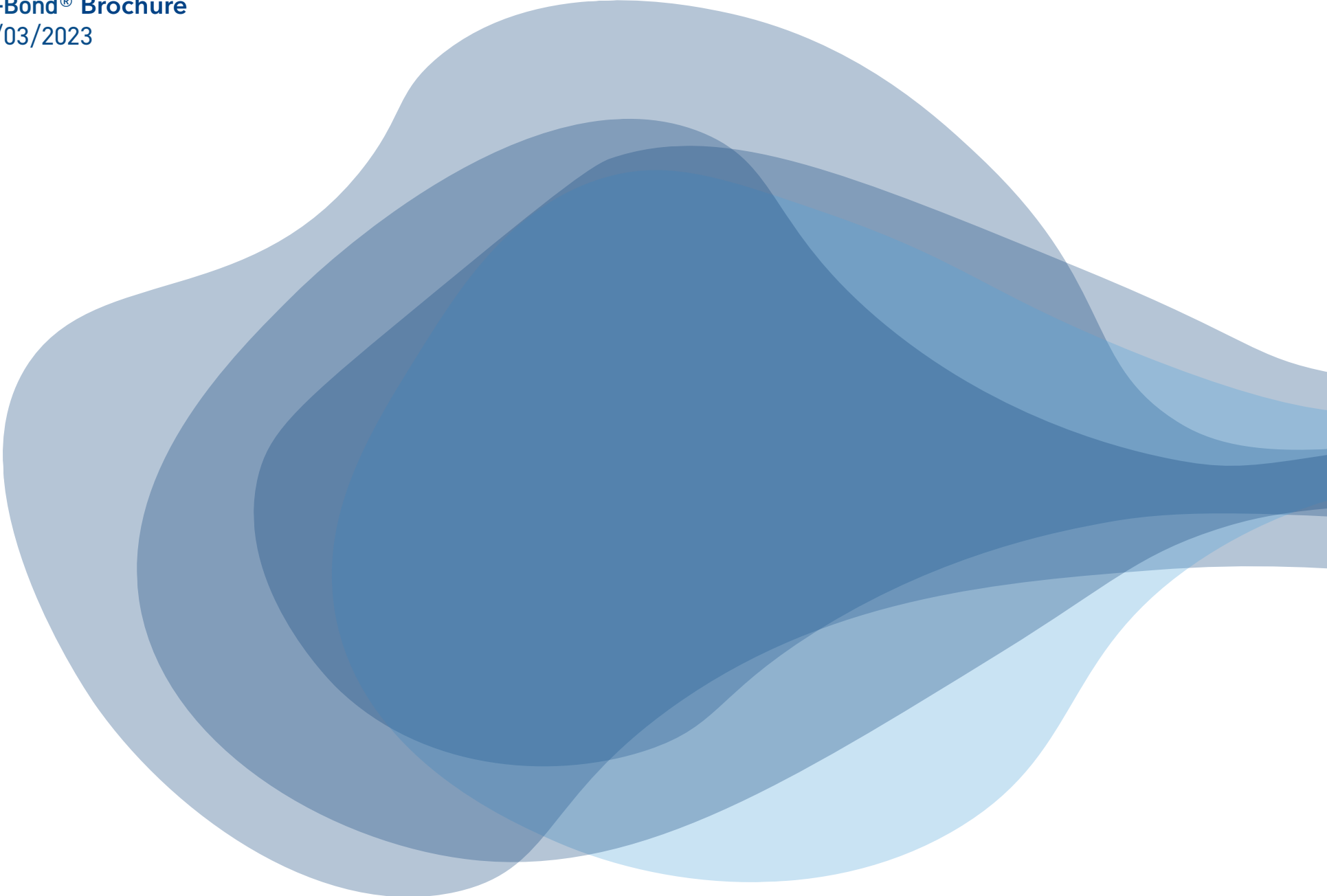


UP

**Tri-Bond®**  
Property of Ultrapharma BV



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# Tri-Bond® Brochure

08/03/2023

## 1. Introduction

Elastomer gaskets are known for their superb sealing capability but are more susceptible to chemicals. PTFE is chemically inert but is a difficult material when it comes to sealing. The best characteristics of both materials are brought together in the Tri-Bond® gasket. The thin PTFE lining on the outside is taking care of the chemical resistance of the gasket while the flexible elastomer inside covers its sealing capabilities. The combination of these features makes this the ultimate pharmaceutical gasket.

## 2. Bonding PTFE to an elastomer

Polytetrafluoroethylene or PTFE, is known as a non-stick or slippery material. It is made up of very stable chemical bonds and is chemically inert, the surface does not react with any chemical molecules it comes into contact with. This is why PTFE is very difficult to bond to anything else. The surface needs to be modified to make it possible to make a bond to the elastomer.

Our Tri-bond® gaskets are irreversibly bonded. Which means that when the gasket is exposed to pressure, steam or chemicals, the elastomer and PTFE won't come loose. This makes the two materials in the gasket working together perfectly and you get the best of both materials.



## 3. Recommended Torque

The Tri-Bond® gasket lasts longer if the correct torque is applied. Over-compression is disastrous for each gasket material, therefore also for Tri-Bond®. We recommend to use the torque guideline as shown in the last column in the table on page 3. We came to these recommendations after testing our gaskets at 10 bar liquid pressure.

Important note: After one steam cycle the gasket settles. As this might cause a leak, simply re-torque with the same value as recommended.



## 4. Compliance

Material:	Tri-Bond® PTFE (PolyTetraFluorEthylene) with EPDM substrate
Compound number:	CMD-1061
Colour:	WHITE/BLACK
Temperature range:	-30 °C / + 155°C
Odor:	None
Storage stability:	10 years
Meets:	FDA CFR 177.1550 FDA CFR 177.2600 USP 39 Class VI 121°C <88> USP 41 Cytotoxicity Testing <87>, ISO 10993-5 USP 43 Physicochemical Testing <661>
Conform with:	ADIF (Animal Derived Ingredient Free) BSE/TSE

Material:	Tri-Bond® PTFE (PolyTetraFluorEthylene) with FKM substrate
Compound number:	CMD-1020
Colour:	WHITE/BLACK
Temperature range:	-30 °C / + 175°C
Odor:	None
Storage stability:	10 years
Meets:	FDA CFR 177.1550 FDA CFR 177.2600 USP 35 Class VI 121°C <88> USP 43 Cytotoxicity Testing <87>, ISO 10993-5 USP 43 Physicochemical Testing <661> EC10/2011 Migration test (PTFE)
Conform with:	ADIF (Animal Derived Ingredient Free) BSE/TSE

## 5. General advice

SIP:	good
CIP:	very good
Mineral oils & grease:	very good
WFI:	excellent
Sterilization:	excellent
Steam Sterilization:	excellent

SIP:	good
CIP:	very good
Mineral oils & grease:	very good
WFI:	excellent
Sterilization:	excellent
Steam Sterilization:	excellent

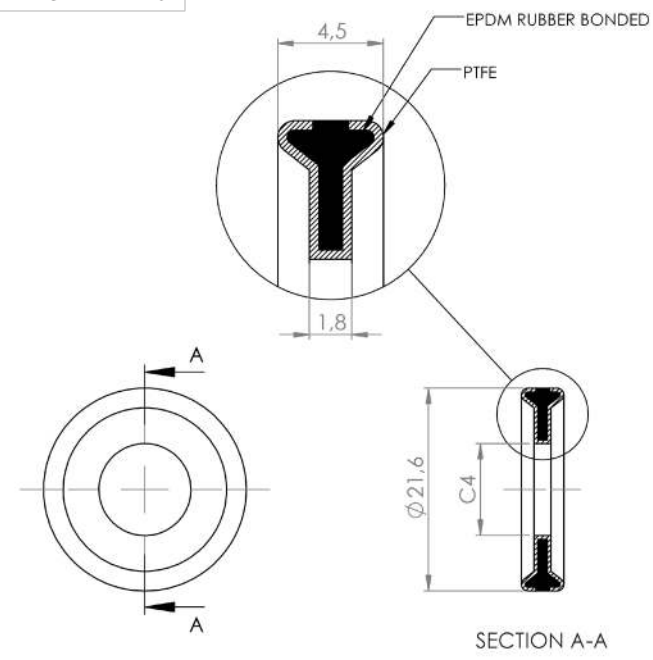
For more information and all the results of the individual compliance testing, our Validation guide is available upon request or sign up for our members hub on the website; [www.ultrapharma.com](http://www.ultrapharma.com).

6. Available sizes (EPDM Rubber bonded)

Mini

ASME BPE SIZE	C4 mm (inch)	Rec. Torque	Rec. Clamp	UP Partnumber
¼"	4.7 (0.19)	1.5 Nm	13LAH	UP42MPGRTB-E-025
3/8"	8.7 (0.34)	1.5 Nm	13LAH	UP42MPGRTB-E-025
½"	9.6 (0.38)	1.5 Nm	13LAH	UP42MPGRTB-E-050
¾"	15.8 (0.62)	1.5 Nm	13LAH	UP42MPGRTB-E-075

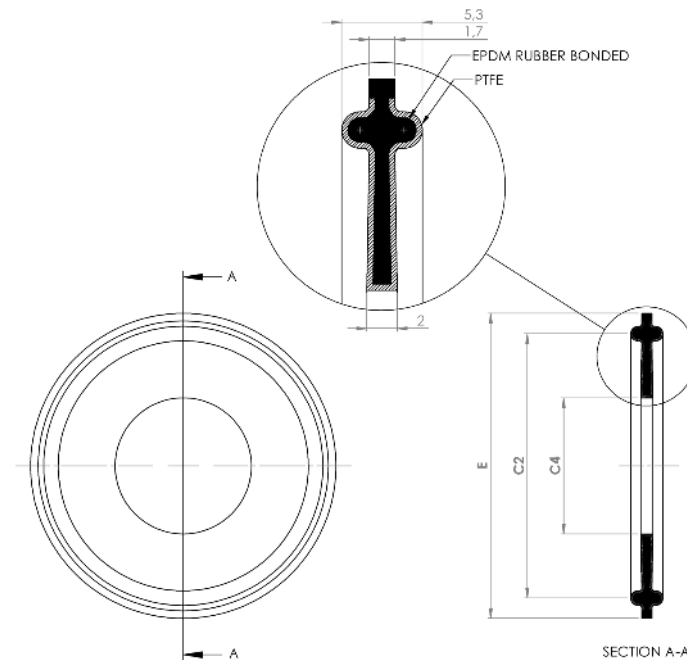
DIN 32676 SIZE	C4 mm (inch)	Rec. Torque	Rec. Clamp	UP Partnumber
DN06	4.7 (0.19)	1.5 Nm	13LAH	UP42MPGRTB-E-DN06
DN08	6.5 (0.26)	1.5 Nm	13LAH	UP42MPGRTB-E-DN08
DN10	8.5 (0.31)	1.5 Nm	13LAH	UP42MPGRTB-E-DN10
DN14	12.5 (0.47)	1.5 Nm	13LAH	UP42MPGRTB-E-DN14
DN16	14.5 (0.55)	1.5 Nm	13LAH	UP42MPGRTB-E-DN16



## EPDM Rubber Bonded

### Type 1

ASME BPE SIZE	E mm (inch)	C4 mm (inch)	C2 mm (inch)	Rec. Torque	Rec. Clamp	UP Partnumber
1"	50.2 (1.98)	22.4 (0.88)	43.5 (1.71)	2 Nm	13LAH	UP40MPGRTB-E-100
1½"	50.2 (1.98)	35.1 (1.38)	43.5 (1.71)	2 Nm	13LAH	UP40MPGRTB-E-150
2"	63.0 (2.48)	48.0 (1.89)	56.5 (2.22)	3 Nm	13LAH	UP40MPGRTB-E-200
2½"	77.0 (3.03)	60.7 (2.39)	70.5 (2.78)	4 Nm	13LAH	UP40MPGRTB-E-250
3"	90.5 (3.56)	73.4 (2.89)	83.5 (3.29)	4 Nm	13LAH	UP40MPGRTB-E-300
4"	118.0 (4.65)	97.8 (3.85)	110.0 (4.33)	6 Nm	13LAH	UP40MPGRTB-E-400
6"	165.3 (6.51)	147.8 (5.82)	156.4 (6.16)	6 Nm	13LAH	UP40MPGRTB-E-600
8"	217.4 (8.56)	198.6 (7.82)	207.0 (8.15)	8 Nm	13LAH	UP40MPGRTB-E-800
10"	268.5 (10.57)	248.2 (9.77)	257.8 (10.15)	8 Nm	13LAH	UP40MPGRTB-E-1000
12"	323.7 (12.74)	299.0 (11.77)	308.6 (12.15)	10 Nm	13LAH	UP40MPGRTB-E-1200



# Tri-Bond® Brochure

08/03/2023

## EPDM Rubber Bonded

### Type 2

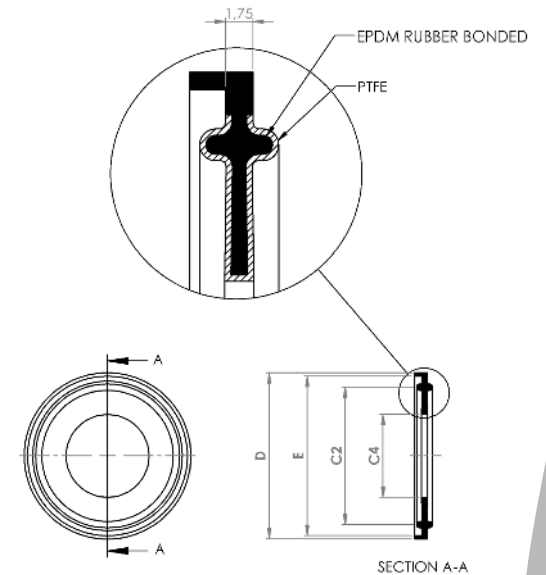
DIN 32676	E mm (inch)	C4 mm (inch)	C2 mm (inch)	D mm (inch)	Rec. Torque	Req. Clamp	UP Partnumber
DN10	34.0 (1.34)	10.2 (0.40)	27.5 (1.08)	36.2 (1.43)	2 Nm	13LAH	UP32MPFGRTB-E-DN10
DN10-50.5	50.5 (1.99)	10.2 (0.40)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP32MPFGRTB-E-50.5-DN10
DN15	34.0 (1.34)	16.2 (0.64)	27.5 (1.08)	36.2 (1.43)	2 Nm	13LAH	UP32MPFGRTB-E-DN15
DN15-50.5	50.5 (1.99)	16.2 (0.64)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP32MPFGRTB-E-50.5-DN15
DN20	34.0 (1.34)	20.2 (0.80)	27.5 (1.08)	36.2 (1.43)	2 Nm	13LAH	UP32MPFGRTB-E-DN20
DN20-50.5	50.5 (1.99)	20.2 (0.80)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP32MPFGRTB-E-50.5-DN20
DN25	50.5 (1.99)	26.2 (1.03)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP32MPFGRTB-E-DN25
DN32	50.5 (1.99)	32.2 (1.27)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP32MPFGRTB-E-DN32
DN40	50.5 (1.99)	38.2 (1.50)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP32MPFGRTB-E-DN40
DN50	64.0 (2.52)	50.2 (1.98)	56.5 (3.29)	66.2 (2.61)	3 Nm	13LAH	UP32MPFGRTB-E-DN50
DN65	91.0 (3.58)	66.2 (2.61)	83.5 (3.29)	93.2 (3.67)	4 Nm	13LAH	UP32MPFGRTB-E-DN65
DN80	106.0 (4.17)	81.2 (3.20)	97.0 (3.82)	108.2 (4.26)	6 Nm	13LAH	UP32MPFGRTB-E-DN80
DN100	119.0 (4.69)	100.2 (3.94)	110.0 (4.33)	121.2 (4.77)	8 Nm	13LAH	UP32MPFGRTB-E-DN100
DN150	183.0 (7.20)	150.2 (5.91)	174.0 (6.85)	185.2 (7.29)	8 Nm	13LAH	UP32MPFGRTB-E-DN150
DN200	233.5 (9.19)	200.2 (7.88)	225.0 (8.86)	235.7 (9.28)	8 Nm	13LAH	UP32MPFGRTB-E-DN200

The given recommended torque is a general advice, the torque may be different under different circumstances.

ISO 1127	E mm (Inch)	C4 mm (Inch)	C2 mm (Inch)	D mm (Inch)	Rec. Torque	Req. Clamp	UP Partnumber
DN10	50.5 (1.99)	14.2 (0.56)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP11MPFGRTB-E-DN10
DN15	50.5 (1.99)	18.3 (0.71)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP11MPFGRTB-E-DN15
DN20	50.5 (1.99)	23.9 (0.94)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP11MPFGRTB-E-DN20
DN25	50.5 (1.99)	29.9 (1.18)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP11MPFGRTB-E-DN25
DN32	50.5 (1.99)	38.6 (1.52)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP11MPFGRTB-E-DN32
DN32-64	64.0 (2.52)	38.6 (1.51)	56.5 (2.22)	66.2 (2.61)	3 Nm	13LAH	UP11MPFGRTB-E-64-DN32
DN40	64.0 (2.52)	44.5 (1.75)	56.5 (2.22)	66.2 (2.61)	3 Nm	13LAH	UP11MPFGRTB-E-DN40
DN50	77.5 (3.05)	56.6 (2.23)	70.5 (2.78)	79.7 (3.17)	4 Nm	13LAH	UP11MPFGRTB-E-DN50
DN65	91.0 (3.58)	72.3 (2.85)	83.5 (3.29)	93.2 (3.67)	4 Nm	13LAH	UP11MPFGRTB-E-DN65
DN80	106.0 (4.17)	84.5 (3.33)	97.0 (3.82)	108.2 (4.26)	6 Nm	13LAH	UP11MPFGRTB-E-DN80
DN100	130.0 (5.12)	109.9 (4.33)	122.0 (4.80)	132.2 (5.20)	6 Nm	13LAH	UP11MPFGRTB-E-DN100
DN150	183.0 (7.20)	163.2 (6.43)	174.0 (6.85)	185.2 (7.29)	8 Nm	13LAH	UP11MPFGRTB-E-DN150

Note: sizes indicated with an asterisk (\*) is not a norm standard.

The given recommended torque is a general advice, the torque may be different under different circumstances.





## 7. Available sizes (FKM Rubber bonded)

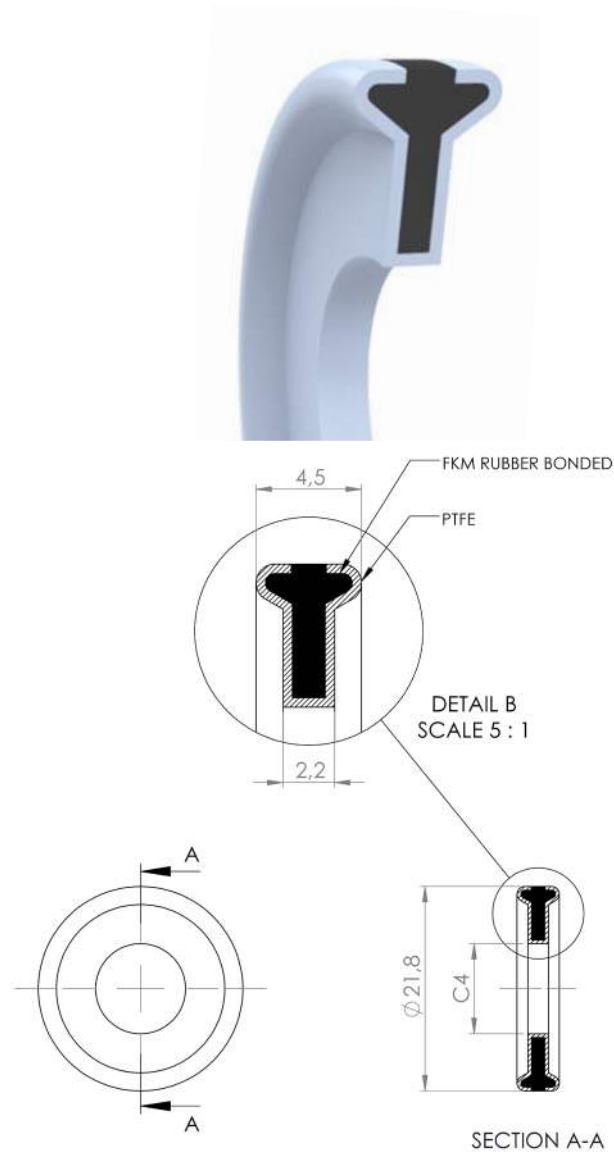
### Mini

DIN 32676 size	C4 mm (inch)	Rec. Torque	Req. Clamp	UP Partnumber
DN10	8.0 (0.31)	1.5 Nm	13LAH	UP42MPGRTB-025-DN10
DN12	10.0 (0.39)	1.5 Nm	13LAH	UP42MPGRTB-025-DN12
DN14	12.0 (0.47)	1.5 Nm	13LAH	UP42MPGRTB-025-DN14
DN16	14.0 (0.55)	1.5 Nm	13LAH	UP42MPGRTB-025-DN16
DN18	16.0 (0.63)	1.5 Nm	13LAH	UP42MPGRTB-025-DN18

The given recommended torque is a general advice, the torque may be different under different circumstances.

ASME BPE size	C4 mm (inch)	Rec. Torque	Req. Clamp	UP Partnumber
½"	9.6 (0.38)	1,5 Nm	13LAH	UP42MPGRTB-050
¾"	15.8 (0.62)	1,5 Nm	13LAH	UP42MPGRTB-075

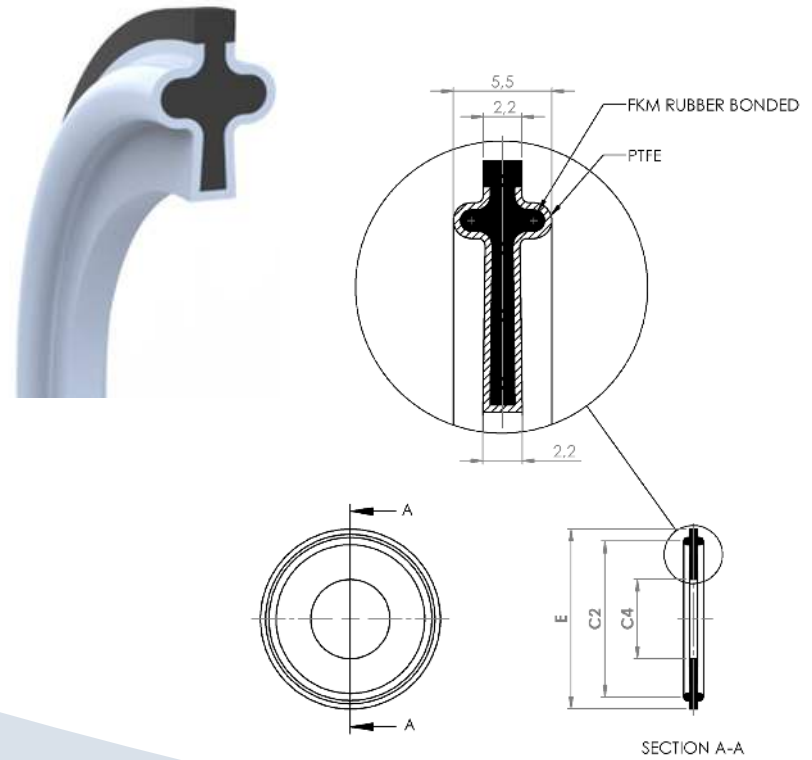
The given recommended torque is a general advice, the torque may be different under different circumstances.



Type 1

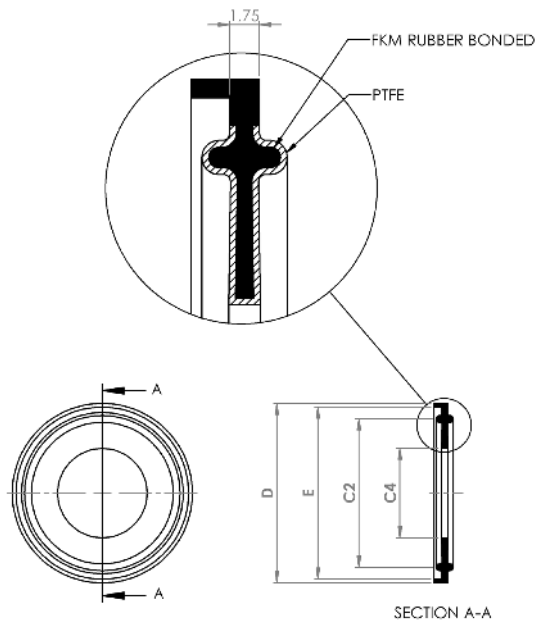
ASME BPE size	E mm (inch)	C4 mm (inch)	C2 mm (inch)	Rec. Torque	Req. Clamp	UP Partnumber
1"	50.2 (1.98)	22.1 (0.87)	43.5 (1.71)	2 Nm	13LAH	UP40MPGRTB-100
1½"	50.2 (1.98)	35.1 (1.38)	43.5 (1.71)	2 Nm	13LAH	UP40MPGRTB-150
2"	63.5 (2.5)	47.4 (1.87)	56.5 (2.22)	3 Nm	13LAH	UP40MPGRTB-200

The given recommended torque is a general advice, the torque may be different under different circumstances.



## FKM Rubber Bonded

### Type 2



DIN 32676 Size	E mm (inch)	C4 mm (inch)	C2 mm (inch)	D mm (inch)	Rec. Torque	Req. Clamp	UP Partnumber
DN10	34.0 (1.34)	10.2 (0.40)	27.5 (1.08)	36.2 (1.43)	2 Nm	13LAH	UP32MPFGRTB-DN10
DN15	34.0 (1.34)	16.2 (0.64)	27.5 (1.08)	36.2 (1.43)	2 Nm	13LAH	UP32MPFGRTB-DN10
DN20	34.0 (1.34)	20.2 (0.80)	27.5 (1.08)	36.2 (1.43)	2 Nm	13LAH	UP32MPFGRTB-DN10
DN25	50.5 (1.99)	26.2 (1.03)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP32MPFGRTB-DN10
DN32	50.5 (1.99)	32.2 (1.27)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP32MPFGRTB-DN10
DN40	50.5 (1.99)	38.2 (1.50)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP32MPFGRTB-DN10
DN50	64.0 (2.52)	50.2 (1.98)	56.5 (3.29)	66.2 (2.61)	3 Nm	13LAH	UP32MPFGRTB-DN10
DN65	91.0 (3.58)	66.2 (2.61)	83.5 (3.29)	93.2 (3.67)	4 Nm	13LAH	UP32MPFGRTB-DN10
DN80	106.0 (4.17)	81.2 (3.20)	97.0 (3.82)	108.2 (4.26)	6 Nm	13LAH	UP32MPFGRTB-DN10
DN100	119.0 (4.69)	100.2 (3.94)	110.0 (4.33)	121.2 (4.77)	6 Nm	13LAH	UP32MPFGRTB-DN10
DN150	183.0 (7.20)	150.2 (5.91)	174.0 (6.85)	185.2 (7.29)	8 Nm	13LAH	UP32MPFGRTB-DN10
DN200	233.5 (9.19)	200.2 (7.88)	225.0 (8.86)	235.7 (9.28)	8 Nm	13LAH	UP32MPFGRTB-DN10

The given recommended torque is a general advice, the torque may be different under different circumstances.

ISO 1127 SIZE	E mm (Inch)	C4 mm (Inch)	C2 mm (Inch)	D mm (Inch)	Rec. Torque	Req. Clamp	UP Partnumber
DN08*	34.0 (1.34)	10.5 (0.41)	27.5 (1.08)	36.2 (1.43)	2 Nm	13LAH	UP11MPFGRTB -DN08
DN10*	34.0 (1.34)	14.2 (0.56)	27.5 (1.08)	36.2 (1.43)	2 Nm	13LAH	UP11MPFGRTB -DN10
DN15*	34.0 (1.34)	18.3 (0.71)	27.5 (1.08)	36.2 (1.43)	2 Nm	13LAH	UP11MPFGRTB -DN15
DN15	50.5 (1.99)	18.3 (0.72)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP11MPFGRTB -50.5-DN15
DN20	50.5 (1.99)	23.9 (0.94)	43.5 (1.71)	52.7 (2.07)	2 Nm	13LAH	UP11MPFGRTB -DN20
DN25	50.5 (1.99)	29.9 (1.18)	43.5 (1.71)	52.7 (2.07)	3 Nm	13LAH	UP11MPFGRTB -DN25
DN32*	50.5 (1.99)	38.6 (1.52)	43.5 (1.71)	52.7 (2.07)	3 Nm	13LAH	UP11MPFGRTB -DN32
DN32	64.0 (2.52)	38.6 (1.51)	56.5 (2.22)	66.2 (2.61)	3 Nm	13LAH	UP11MPFGRTB -64-DN32
DN40	64.0 (2.52)	44.5 (1.75)	56.5 (2.22)	66.2 (2.61)	3 Nm	13LAH	UP11MPFGRTB -DN40
DN50	77.5 (3.05)	56.6 (2.23)	70.5 (2.78)	79.7 (3.17)	4 Nm	13LAH	UP11MPFGRTB -DN50
DN65	91.0 (3.58)	72.3 (2.85)	83.5 (3.29)	93.2 (3.67)	4 Nm	13LAH	UP11MPFGRTB -DN65
DN80	106.0 (4.17)	84.5 (3.33)	97.0 (3.82)	108.2 (4.26)	6 Nm	13LAH	UP11MPFGRTB -D80
DN100	130.0 (5.12)	109.9 (4.33)	122.0 (4.80)	132.2 (5.20)	6 Nm	13LAH	UP11MPFGRTB -DN100
DN150	183.0 (7.20)	163.2 (6.43)	174.0 (6.85)	185.2 (7.29)	8 Nm	13LAH	UP11MPFGRTB -DN150
DN200	233.5 (9.19)	213.9 (8.42)	225.0 (8.86)	235.7 (9.28)	8 Nm	13LAH	UP11MPFGRTB -DN200

Note: sizes indicated with an asterisk (\*) is not a norm standard.

The given recommended torque is a general advice, the torque may be different under different circumstances.

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