R1 85 01 01 Technical Directive

Field of application and range of 'gaskets' on the basis of: *Media, Flanges, Bores (DN), Pressure stages (PN) en Temperatures*

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Table of contents

1. FIELDS OF APPLICATION BASED ON THE MEDIA PRESENT AT TATA STEEL

1.1. General

In this Technical Directive, the letters A to G inclusive represent the various gaskets described in Subsection 1.2, taking into account that graphite-containing gaskets are the preferred choice from a technical point of view, because of their almost universal field of application at Tata Steel.

1.2. Description

for:

A - "Graphite with nail plate" sheet gasket and gasket rings up to and including DN 800 - PN 40

B - Gasket rings DN 900 and bigger, consisting of a 1 mm-thick steel (16 Mo3) carrier with a 0.5 mm graphite on both sides. For oxygen, the carrier material no. is 1.4404 / AISI 316 L

C - "SIL C4400" gaskets

D - "SIL C4430" gaskets

E - PTFE gasket rings strengthened with stainless steel

F - "Hypalon" gaskets

G - "NBR" gaskets

1.3. Fields of application

Media

CHEMICALS	A	B	C	D	E	F*	G
Waste oil and/or emulsion	x	x	x	x			
Ammonium sulphate slurry							x
Ammonium sulphate solution (mother liquor) + saturated ammonium sulphate solution							x
Biotex							
BTX	x	x	x	x			
Chemical waste							
Chlorine bleach lye	x	x	x	x			
Chromic acid					x		
Citric acid							
Electrolytic paraphenol sulfonic acid							
Phosphoric acid					x		
Freon 11, 12 and 22	x	x					
Hydrazine	x	x				x	
Lithium bromide steam solution							
Lithium bromide 100%							
Lithium bromide strong solution							
Lithium bromide weak solution							
MEA solution rich/poor	x	x					
Monaethanolamine (MEA) fresh	x	x					
Sodium dichromate	x	x				x	
Caustic soda	x	x				x	
Paraphenol sulfonic acid	x	x					
Soda	x	x	x	x	x		
Urea	x	x					
Liquid sulphur							x
Hydrochloric acid up to and including 60 °C					x	x	
Sulphuric acid 78%					x		

* If clad flanges or plastic flanges are used.

Note:
Fields of application F and G for chemicals have been included as basic information. A precise analysis and the chemical resistance must be aligned to each other before a final choice is made.

1.3. Fields of application (continued)

Media

MISCELLANEOUS	A	B	C	D	E	F*	G
Ammonium sulphate							x
Wood flour slurry							x
Coal tar	x	x				x	
Nitric acid					x		
BLOWING SYSTEMS (OPEN)							
MEA vapour	x	x					
Steam-condensate 0 bar - 275 °C	x	x					
GAS							
Natural gas	x	x	x	x			x
Acetylene	x	x					x
Ammonia fumes	x	x					x
Argon	x	x	x	x			
AX gas (shielding gas)	x	x	x	x			
Combustible							
BTX water vapour	x	x					
Vapour lines (BTX/ KF1)	x	x					
DX gas							
Helium	x	x	x	x			
HNX gas (shielding gas)	x	x	x	x			
Blast furnace gas	x	x	x	x			
Blast furnace gas enriched (mixed gas)	x	x	x	x			
Coke oven gas	x	x	x	x			
Oxygas	x	x	x	x			
Propane	x	x					x
Furnace gas (dry/wet)	x	x	x	x			
Raw gas	x	x	x	x			
Nitrogen	x	x	x	x			
Substitute gas	x	x	x	x			
Technical hydrogen vapour							
Hydrogen gas 100%	x	x	x	x			
Oxygen	x	x #					
Sulphur dioxide gas	x	x			x		
Sulphur trioxide gas					x		

* If clad flanges or plastic flanges are used
\# Gasket with 1 mm-thick stainless steel carrier, mat. no. 1.4404 / AISI 316 L

1.3. Fields of application (continued)

Media

AIR	A	B	C	D	E	F*	G
Waste air							
Dried compressed air	x	x	x	x			
Instrument air	x	x					x
Supplied air	x	x	x	x			
Compressed air	x	x					x
Vacuum	x	x	x	x			
Combustion air	x	x	x	x			
OIL							
Petrol							
Gas oil	x	x	x	x			
Hydraulic oil			see Technical Directive R1 42 01 01				
Oil sludge							
Lubricating oil			see Technical Directive R1 55 01 01				
Thermal oil	x	x	x	x			
Rolling oil	x	x				x	
Wash oil	x	x				x	
STEAM							
Steam - condensate	x	x					
Steam, low pressure	x	x					
Steam, medium pressure	x	x					
Steam, high pressure (40 bar max.)	x	x					
WATER							
A-water	x	x					x
Waste water / sewage	x	x	x	x			
Ammonia water	x	x	x	x			
Battery water	x	x	x	x			
Brackish water	x	x					x
Drinking water	x	x					x
G water	x	x					x
M water	x	x					x
Softened water	x	x					x
Furnace cooling water							
Sea water (salt water)	x	x					x
Fresh water (leak water)	x	x					x
Salt spring water	x	x	x	x			

* If clad flanges or plastic flanges are used

2. CHARTS ON AREAS FOR USE

2.1. Area of use for flange designs that are used at Tata Steel

Flanges used at Tata steel:

- DIN welding neck flanges with illustration
- Flanges put together by Tata Steel
- a combination of DIN welding neck and a flange put together by Tata Steel

2.2. Area of use for graphite gasket consisting of a “graphite nail plate” with a perforated stainless steel reinforcing layer and a “graphite laminate” with a steel (16 Mo3) carrier ring

Area of use:

Temperature -200 to approximately + 450 °C.

2.3. Area of use for flanged joints accepted by the “Rules for pressure vessels” (RToD), sheet D0701, and DIN 2690

“Rules”, sheet D0701, accepted. Gasket dimensions in accordance with DIN 2690.

Suitable for It-characterised gaskets and “graphite nail plate” or “graphite laminate” with 16 Mo3 carrier ring.

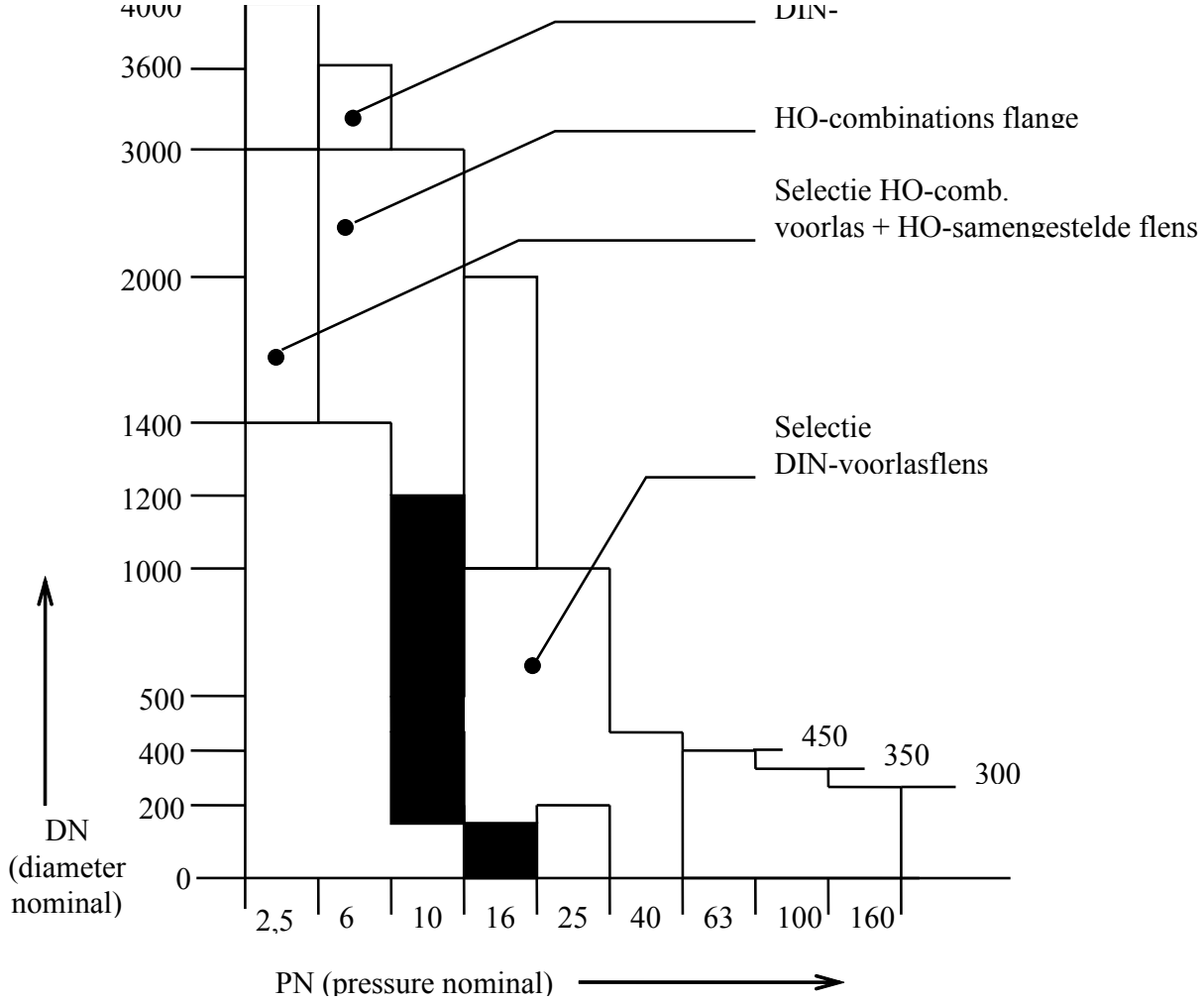
Area of use:

– Flanged joint usually approved after calculation

+ – DIN welding neck flanged joint will be approved subject to certain conditions

– DIN welding neck flanges, for example DN 700 - PN 16, will only be approved with a “graphite nail plate”, width 20 mm, and P bolt of 94 kN.

2.4. Area of use for PTFE gasket rings with a stainless steel core for acids

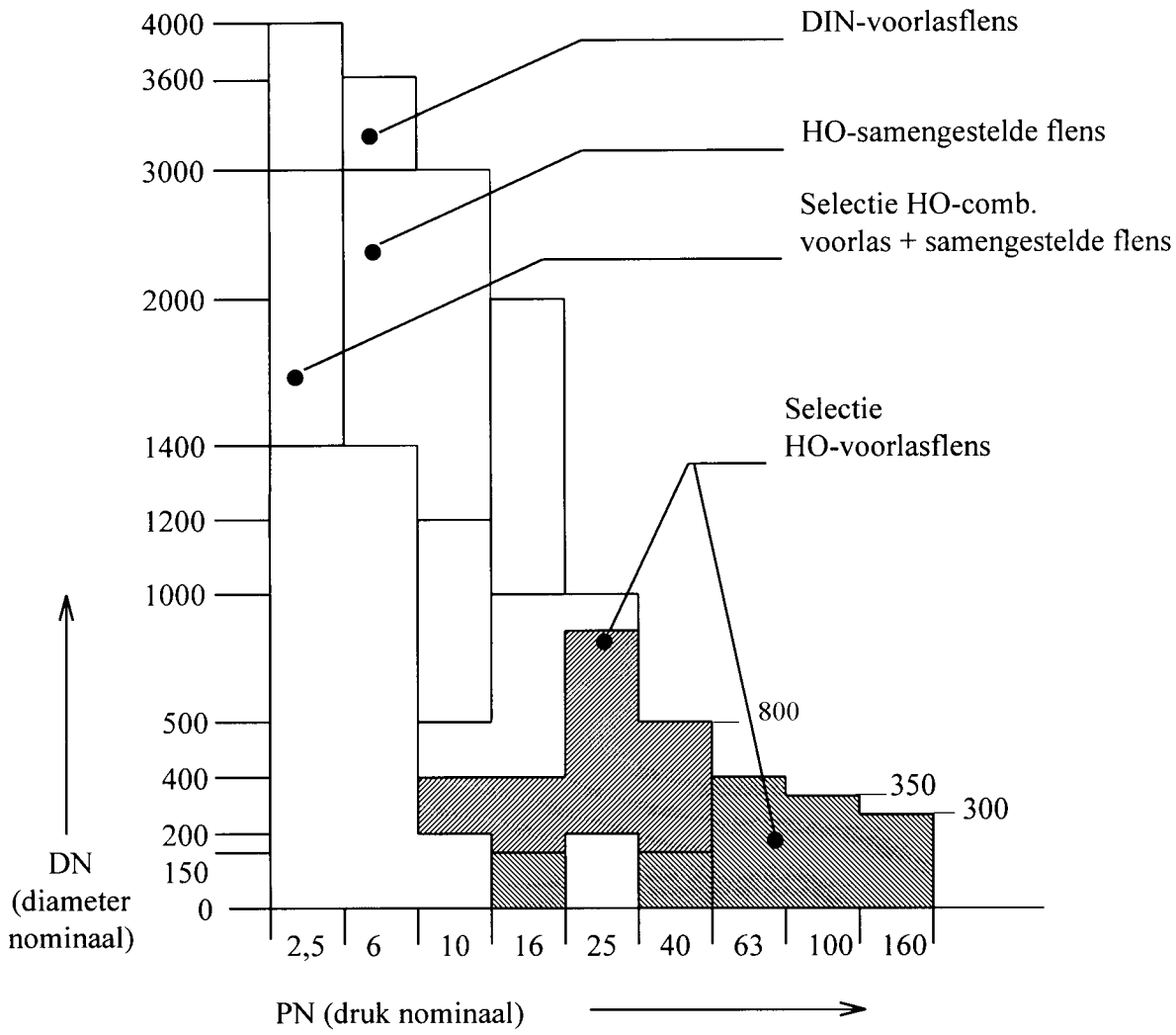


PTFE with a stainless steel core for various media with DIN flange joints.

– max. temperature 200 °C

■ – area of use

2.5. Area of use for gasket SIL C 4430 for gases



SIL C 4430 for gases with DIN - welding neck flanged joints:

– temperature - 40 to + 120 °C.

Area of use:

– Without a fitting reserve

– With a fitting reserve

– A broader area of use applies for flanges that have been put together by Tata Steel.

2.6. Area of use for gasket SIL C 4400 for gases

SIL C 4400 for gases with DIN - welding neck flanged joints:

- temperature - 40 to + 80 °C
- PN 2.5 area of use does not apply for DIN - welding neck flanged joints

Area of use:

- Without a fitting reserve
- With a fitting reserve

- A broader area of use applies for block flanges.

2.7. Area of use for gasket SIL C 4400 and SIL C 4430 for liquids

SIL C 4400 and C 4430 for liquids with DIN welding neck flanged joints:

- SIL C 4400 : temperature - 40 to + 80 °C
  : P bolt limited

- SIL C 4430 : temperature - 40 to + 120 °C

Tests have shown that if the preformed gasket surface pressure is a requirement, the information in Subsections 2.5 and 2.6 will apply for liquids too.

▨ – Area of use

2.8. Area of use of rubber (NBR and Hypalon) for liquids

Rubber for liquids with DIN welding neck flanges:

- NBR : temperature - 15 to + 80 °C
- Hypalon : temperature - 20 to + 110 °C

▨ – Area of use

Note:

- Pipe forces must be minimal.
- No moments, pressures forces or compressive forces.

3. GASKET WITH "GRAPHITE NAIL PLATE"

3.1. Material

Graphite with a perforated 0.1 mm-thick stainless steel (mat.no. 1.4401/ AISI 316) reinforcing layer and accompanied by BAM certification.

3.2. Sheet gasket

Dimensions:

Standard dimensions : 1000 x 1000 mm
Sheet thickness : 2 mm

3.3. Gasket rings, up to and including DN 800 suitable for DIN 2501 - PN 10 up to and including 40 flange joints

Dimensions:

All of the dimensions included in the table are based on DIN 2690.

Sizes in mm

			DIN 2501 - PN					
DN	d1	d2	2.5	6	10	16	25	40
10	18	38						
10	18	45				x		x
15	22	43						
15	22	50				x		x
20	28	53						
20	28	60				x		x

3.3. Dimensions (continued)

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
25	35	63						
25	35	70				x		x
32	43	75						
32	43	82				x		x
40	49	85						
40	49	92				x		x
50	61	95						
50	61	107				x		x
65	77	115						
65	77	127				x		x
80	90	132						
80	90	142				x		x
100	115	152						
100	115	162				x		
100	115	168						x
125	141	182						
125	141	192				x		
125	141	195						x
150	169	207						
150	169	218				x		
150	169	225						x
200	220	262						
200	220	273			x	x		
200	220	285					x	
200	220	292						x
250	274	318						
250	274	328			x			
250	274	330				x		
250	274	342					x	
250	274	353						x

3.3. Dimensions (continued)

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
300	325	373						
300	325	378			x			
300	325	385				x		
300	325	402					x	
300	325	418						x
400	420	473						
400	420	490			x			
400	420	497				x		
400	420	515					x	
400	420	547						x
500	520	578						
500	520	595			x			
500	520	618				x		
500	520	625					x	
500	520	628						
600	620	680						
600	620	695			x			
600	620	735				x		
600	620	730					x	
600	620	745						
700	720	785						
700	720	810			x			
700	720	805				x		
700	720	830					x	
700	720	850						
800	820	890						
800	820	915			x			
800	820	910				x		
800	820	940					x	
800	820	970						

3.4. Areas of use

For details of the areas of use for the gasket described in this Technical Directive, see Subsection 2.2.

3.5. Description

The “graphite with nail plate” to be used for these gasket rings must meet the following minimum requirements:

– Temperature	max. °C	: ~ 450
– Pressure	max. bar	: 200
– Max. surface pressure cold at a minimum edge width of 20 mm	N/mm²	: 140
– Compressibility in accordance with ASTM F36 A	%	: 35-40
– Spring-back in accordance with ASTM F36 A	%	: 13-18
– Compressive strength in accordance with DIN 52913	N/mm²	: 48
– Tensile strength in accordance with ASTM F 152	N/mm²	: 45
– Thickness increase in accordance with ASTM F 146 after 5 hours / 21 °C in ASTM fuel B	%	: < 4
– Gas permeability in accordance with DIN 3535/4	ml/min	: 0.5
– Thermal conduction in accordance with ASTM F 433	W/m K	: 140
– Density		
– Free chlorides	ppm	: < 20
– Graphite purity	%	: 99.85

- Liquid and gas density in standard test:
  P = 10 bar, d = 2 mm, the gasket surface pressure required is 15 N/mm² and the leak limit is
  0.25 ml/min.
- Fire-safe in accordance with BS 5146/1
- In accordance with ASTM F 607, the
  adhesive must be zero.

4. GRAPHITE GASKET RINGS WITH STEEL CARRIER, DN 900 AND BIGGER FOR DIN 2501 - PN 2.5 UP TO AND INCLUDING 25 FLANGE JOINTS

4.1. Dimensions

All of the dimensions included in the table are based on DIN 2690

Sizes in mm

			DIN 2501 - PN					
DN	d1	d2	2.5	6	10	16	25	40
900	920	990						
900	920	1015			x			
900	920	1010				x		
900	920	1040					x	
900	920	1080						
1000	1020	1090						
1000	1020	1120			x			
1000	1020	1125				x		
1000	1020	1150					x	
1000	1020	1190						
1200	1220	1290						
1200	1220	1305						
1200	1220	1340			x			
1200	1220	1340				x		
1200	1220	1360						
1200	1220	1395						
1400	1420	1490	x					
1400	1420	1520		x				
1400	1420	1545			x			
1400	1420	1540				x		
1400	1420	1575						
1400	1420	1615						

4.1. Dimensions (continued)

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
1600	1620	1700	x					
1600	1620	1720		x				
1600	1620	1770			x			
1600	1620	1760				x		
1600	1620	1795						
1600	1620	1830						
1800	1820	1900	x					
1800	1820	1930		x				
1800	1820	1970			x			
1800	1820	1960				x		
1800	1820	2000						
2000	2020	2100	x					
2000	2020	2135		x				
2000	2020	2180			x			
2000	2020	2165				x		
2000	2020	2230						
2200	2220	2305	x					
2200	2220	2345		x				
2200	2220	2380			x			
2200	2220	2375						
2400	2420	2505	x					
2400	2420	2555		x				
2400	2420	2590			x			
2400	2420	2585						
2600	2620	2705	x					
2600	2620	2760		x				
2600	2620	2790			x			
2600	2620	2785						
2800	2820	2920	x					
2800	2820	2970		x				
2800	2820	3010			x			
3000	3020	3120	x					
3000	3020	3170		x				
3000	3020	3225			x			

4.1. Dimensions (continued)

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
3200	3220	3320	x					
3200	3220	3380		x				
3400	3420	3520	x					
3400	3420	3590		x				
3600	3620	3730	x					
3600	3620	3800		x				
3800	3820	3930	x					
4000	4020	4130	x					

4.2. Material

Steel carrier (16 Mo3 - EN 10088), 1 mm thick with graphite with a thickness of 0.5 mm on both sides. For oxygen: steel carrier, mat.no. 1.4404 / AISI 316 L.

4.3. Areas of use

For details of the areas of use applicable for the gasket described, see Subsection 2.2.

4.4. Description

The material used for the gasket rings must meet the following minimum requirements:

- Temperature — max. °C : ~ 400
- Pressure — max. bar : 200
- Max. surface pressure cold at a minimum edge width of 20 mm — N/mm² : 140
- Compressibility in accordance with ASTM F 36 A for graphite — % : 35 - 40
- Compressive strength in accordance with DIN 52913 — N/mm² : 48
- Gas permeability in accordance with DIN 3535/4 — ml/min : 0.5
- Thermal conduction in accordance with ASTM F 433 — W/m K : 140
- Free chlorides — ppm : < 20
- Graphite purity — % : 99.85
- Liquid and gas leakproofness in standard test:
  P = 10 bar, d = 2 mm, the gasket surface pressure required is 15 N/mm²
  and the leak limit is 0.25 ml/min.
- Fire-safe in accordance with BS 5146/1

- In accordance with ASTM F 607, the adhesive must be zero.

5. GASKET TYPE SIL C 4400 FOR GASES

5.1. Material

Primarily rubber-bound aramid fibres with additions and accompanied by BAM certification.

5.2. Sheet gasket

Dimensions:

Standard dimensions : 1500 x 1500 mm
Sheet thickness : 3 mm

5.3. Gasket rings suitable for DIN 2501 - PN 2.5 up to and including 40 flanged joints

Dimensions:

All of the dimensions included in the table are based on DIN 2690.

Sizes in mm

			DIN 2501 - PN					
DN	d1	d2	2.5	6	10	16	25	40
10	18	38						
10	18	45				x		x
15	22	43						
15	22	50				x		x
20	28	53						
20	28	60				x		x
25	35	63						
25	35	70				x		x

5.3. Dimensions (continued):

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
32	43	75						
32	43	82				x		x
40	49	85						
40	49	92				x		x
50	61	95						
50	61	107				x		x
65	77	115						
65	77	127				x		x
80	90	132						
80	90	142				x		x
100	115	152						
100	115	162				x		
100	115	168						x
125	141	182						
125	141	192				x		
125	141	195						x
150	169	207						
150	169	218				x		
150	169	225						x
200	220	262						
200	220	273			x^	x^		
200	220	285					x^	
200	220	292						x^
250	274	318						
250	274	328			x^			
250	274	330				x^		
250	274	342					x^	
250	274	353						x^
300	325	373						
300	325	378			x^			
300	325	385				x^		
300	325	402					x^	
300	325	418						x^

5.3. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
400	420	473						
400	420	490			x^			
400	420	497				x^		
400	420	515					x^	
400	420	547						x^
500	520	578						
500	520	595			x^			
500	520	618				x^		
500	520	625					x^	
500	520	628						x^
600	620	680						
600	620	695						
600	620	735				x^		
600	620	730					x^	
600	620	745						
700	720	785						
700	720	810						
700	720	805				x^		
700	720	830					x^	
700	720	850						
800	820	890						
800	820	915						
800	820	910				x^		
800	820	940					x^	
800	820	970						
900	920	990						
900	920	1015						
900	920	1010				x^		
900	920	1040					x^	
900	920	1080						
1000	1020	1090						
1000	1020	1120						
1000	1020	1125				x^		
1000	1020	1150					x^	
1000	1020	1190						

5.3. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
1200	1220	1290						
1200	1220	1305						
1200	1220	1340						
1200	1220	1340						
1200	1220	1360						
1200	1220	1395						
1400	1420	1490	x^					
1400	1420	1520						
1400	1420	1545						
1400	1420	1540						
1400	1420	1575						
1400	1420	1615						
1600	1620	1700	x^					
1600	1620	1720						
1600	1620	1770						
1600	1620	1760						
1600	1620	1795						
1600	1620	1830						
1800	1820	1900	x^					
1800	1820	1930						
1800	1820	1970						
1800	1820	1960						
1800	1820	2000						
2000	2020	2100	x^					
2000	2020	2135						
2000	2020	2180						
2000	2020	2165						
2000	2020	2230						
2200	2220	2305	x^					
2200	2220	2345						
2200	2220	2380						
2200	2220	2375						
2400	2420	2505	x^					
2400	2420	2555						
2400	2420	2590						
2400	2420	2585						

5.3. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
2600	2620	2705	x^					
2600	2620	2760						
2600	2620	2790						
2600	2620	2785						
2800	2820	2920	x^					
2800	2820	2970						
2800	2820	3010						
3000	3020	3120	x^					
3000	3020	3170						
3000	3020	3225						
3200	3220	3320	x^					
3200	3220	3380						
3400	3420	3520	x^					
3400	3420	3590						
3600	3620	3730	x^					
3600	3620	3800						
3800	3820	3930	x^					
4000	4020	4130	x^					

x^ = no fitting reserve for DIN welding neck flanges

5.4. Areas of use

For details of the areas of use applicable for the gasket described, see Subsection 2.6.

5.5. Description

The material "SIL C 4400" must meet the following minimum requirements:

– Temperature *	max. °C	: 80
– Pressure	max. bar	: 100
– Max. surface pressure cold at 23 °C	N/mm²	: 70
– Compressibility in accordance with ASTM F 36 A	%	: ~ 8
– Spring-back in accordance with ASTM F 36 A	%	: ~ 50
– Compressive strength in accordance with DIN 52913	N/mm²	: > 25 nm
– Tensile strength in accordance with ASTM F 152:		
– in fibre direction	N/mm²	: 35
– perpendicular to fibre direction	N/mm²	: 15
– Tensile strength reduction in accordance with ASTM F 152	%	: 15
after 5 hours/150 °C in ASTM oil no. 3	%	: < 15
– Weight increase in accordance with ASTM F146 after 5 hours / 23 °C in ASTM fuel B		
– Thickness increase in accordance with ASTM F 146 after 5 hours / 21 °C in ASTM fuel B	%	: 0-5
– Gas permeability in accordance with DIN 3535/4	ml/min.	: 0.1
– Thermal conduction in accordance with ASTM F 433	W/m K	: 0.4
– Density		: 1.5
– Free chlorides	ppm	: < 100
– Adhesive in accordance with ASTM F 607	N/mm²	: 0.13

– With a standard test where P = 10 bar and d = 3 mm, the surface pressure required for the fluid density is 8 N/mm² and the gas density 25 N/mm²

* The limited temperature limit applies for the "soft area" in DIN welding neck flange group PN 2.5 up to and including 40.

6. GASKET TYPE SIL C 4430 FOR GASES

6.1. Material

Primarily rubber-bound clad glass fibres with an addition of approx. 7% aramid fibres.

6.2. Sheet gasket

Dimensions

Standard dimensions : 1500 x 1500 mm
Sheet thickness : 3 mm

6.3. Gasket rings suitable for DIN 2501 - PN 2.5 up to and including 40 flanged joints

Dimensions

Sizes in mm

			DIN 2501 - PN					
DN	d1	d2	2.5	6	10	16	25	40
10	18	38						
10	18	45				x		x
15	22	43						
15	22	50				x		x
20	28	53						
20	28	60				x		x
25	35	63						
25	35	70				x		x
32	43	75						
32	43	82				x		x
40	49	85						
40	49	92				x		x
50	61	95						
50	61	107				x		x

6.3. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
65	77	115						
65	77	127				x		x
80	90	132						
80	90	142				x		x
100	115	152						
100	115	162				x		
100	115	168						x
125	141	182						
125	141	192				x		
125	141	195						x
150	169	207						
150	169	218				x		
150	169	225						x
200	220	262						
200	220	273			x^	x^		
200	220	285					x^	
200	220	292						x^
250	274	318						
250	274	328			x^			
250	274	330				x^		
250	274	342					x^	
250	274	353						x^
300	325	373						
300	325	378			x^			
300	325	385				x^		
300	325	402					x^	
300	325	418						x^
400	420	473						
400	420	490			x^			
400	420	497				x^		
400	420	515					x^	
400	420	547						x^

6.3. Dimensions (continued)

Sizes in mm

DN	d1	d2	2.5	6	10	16	25	40
500	520	578						
500	520	595						
500	520	618						
500	520	625					x^	
500	520	628						x^
600	620	680						
600	620	695						
600	620	735						
600	620	730					x^	
600	620	745						
700	720	785						
700	720	810						
700	720	805						
700	720	830					x^	
700	720	850						
800	820	890						
800	820	915						
800	820	910						
800	820	940					x^	
800	820	970						

x^ = The combination of a block flange with a DIN welding neck flange has no fitting reserve.

6.4. Areas of use

For details of the areas of use applicable for the gasket described, see Subsection 2.7.

6.5. Description

The material "SIL C 4430" for the gasket rings must meet the following minimum requirements:

– Temperature *	max. °C	: 120
– Pressure	max. bar	: 100
– Max. surface pressure cold at 23 °C	N/mm²	: 80
– Compressibility in accordance with ASTM F 36 A	%	: 11
– Spring-back in accordance with ASTM F 36 A	%	: 55
– Compressive strength in accordance with DIN 52913	N/mm²	: 35
– Tensile strength in accordance with ASTM F 152:		
– in fibre direction	N/mm²	: 22
– perpendicular to fibre direction	N/mm²	: 9
– Tensile strength reduction in accordance with ASTM F 152 after 5 hours / 150 °C in ASTM oil no. 3	%	: 24
– Weight increase in accordance with ASTM F 146 after 5 hours / 23 °C in ASTM fuel B	%	: 10-15
– Thickness increase in accordance with ASTM F 146 after 5 hours / 21 °C in ASTM fuel B	%	: 0-5
– Gas permeability in accordance with DIN 3535/4	ml/min.	: < 2
– Thermal conduction in accordance with ASTM F 433	W/m K	: 0.4
– Density		: 1.65
– Free chlorides	ppm:	< 100
– Adhesive in accordance with ASTM F 607	N/mm²	: 0.23

– With a standard test where P = 10 bar and d = 3 mm, the surface pressure required for the fluid density is 8 N/mm² and the gas density 42 N/mm²
– Fire-safe in accordance with BS 5146/1

* The limited temperature limit applies for the "soft area" in DIN welding neck flange group PN 2.5 up to and including 40.

7. GASKET TYPE SIL C 4400 AND SIL C 4430 FOR LIQUIDS

7.1. Material

C 4400: Primarily rubber-bound aramid fibres with additions and accompanied by BAM certification.
C 4430: Primarily rubber-bound clad glass fibres with an addition of approx. 7 % aramid fibres.

7.2. Sheet gasket

Dimensions:

Standard dimensions : 1500 x 1500 mm
Sheet thickness : 3 mm

7.3. Gasket rings suitable for DIN 2501 - PN 2.5 up to and including 40 flanged joints

Dimensions:
All of the dimensions included in the table are based on DIN 2690.

Sizes in mm

			DIN 2501 - PN					
DN	d1	d2	2.5	6	10	16	25	40
10	18	38						
10	18	45				x		x
15	22	43						
15	22	50				x		x
20	28	53						
20	28	60				x		x
25	35	63						
25	35	70				x		x

7.3. Dimensions (continued):

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
32	43	75						
32	43	82				x		x
40	49	85						
40	49	92				x		x
50	61	95						
50	61	107				x		x
65	77	115						
65	77	127				x		x
80	90	132						
80	90	142				x		x
100	115	152						
100	115	162				x		
100	115	168						x
125	141	182						
125	141	192				x		
125	141	195						x
150	169	207						
150	169	218				x		
150	169	225						x
200	220	262						
200	220	273			x	x		
200	220	285					x	
200	220	292						x
250	274	318						
250	274	328			x			
250	274	330				x		
250	274	342					x	
250	274	353						x
300	325	373						
300	325	378			x			
300	325	385				x		
300	325	402					x	
300	325	418						x

7.3. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
400	420	473						
400	420	490			x			
400	420	497				x		
400	420	515					x	
400	420	547						x
500	520	578						
500	520	595			x			
500	520	618				x		
500	520	625					x	
500	520	628						x
600	620	680						
600	620	695			x			
600	620	735				x		
600	620	730					x	
600	620	745						
700	720	785						
700	720	810			x			
700	720	805				x		
700	720	830					x	
700	720	850						
800	820	890						
800	820	915			x			
800	820	910				x		
800	820	940					x	
800	820	970						
900	920	990						
900	920	1015			x			
900	920	1010				x		
900	920	1040					x	
900	920	1080						
1000	1020	1090						
1000	1020	1120			x			
1000	1020	1125				x		
1000	1020	1150					x	
1000	1020	1190						

7.3. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
1200	1220	1290						
1200	1220	1305						
1200	1220	1340			x			
1200	1220	1340						
1200	1220	1360						
1200	1220	1395						
1400	1420	1490	x					
1400	1420	1520						
1400	1420	1545						
1400	1420	1540						
1400	1420	1575						
1400	1420	1615						
1600	1620	1700	x					
1600	1620	1720						
1600	1620	1770						
1600	1620	1760						
1600	1620	1795						
1600	1620	1830						
1800	1820	1900	x					
1800	1820	1930						
1800	1820	1970						
1800	1820	1960						
1800	1820	2000						
2000	2020	2100	x					
2000	2020	2135						
2000	2020	2180						
2000	2020	2165						
2000	2020	2230						
2200	2220	2305	x					
2200	2220	2345						
2200	2220	2380						
2200	2220	2375						
2400	2420	2505	x					
2400	2420	2555						
2400	2420	2590						
2400	2420	2585						

7.3. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16	25	40
2600	2620	2705	x					
2600	2620	2760						
2600	2620	2790						
2600	2620	2785						
2800	2820	2920	x					
2800	2820	2970						
2800	2820	3010						
3000	3020	3120	x					
3000	3020	3170						
3000	3020	3225						
3200	3220	3320	x					
3200	3220	3380						
3400	3420	3520	x					
3400	3420	3590						
3600	3620	3730	x					
3600	3620	3800						
3800	3820	3930	x					
4000	4020	4130	x					

7.4. Areas of use

For details of the areas of use applicable for the gasket described, see Subsection 2.7.

7.5. Description

- For gasket type C 4400, see Subsection 5.5 of this Technical Directive.
- For gasket type C 4430, see Subsection 6.5 of this Technical Directive.

8. PTFE GASKET RINGS REINFORCED WITH STAINLESS STEEL

8.1. Material

PTFE with a perforated 0.5-mm thick stainless steel reinforcing layer (mat.no. 1.4301 / AISI 304).

8.2. Gasket rings, suitable for DIN 2501 - PN 10/16 flanged joints

Dimensions:

All of the dimensions included in the table are based on DIN 2690.

Sizes in mm

			DIN 2501 - PN			
DN	d1	d2	2.5	6	10	16
10	18	38				
10	18	45				x
15	22	43				
15	22	50				x
20	28	53				
20	28	60				x
25	35	63				
25	35	70				x
32	43	75				
32	43	82				x

8.2. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16
40	49	85				
40	49	92				x
50	61	95				
50	61	107				x
65	77	115				
65	77	127				x
80	90	132				
80	90	142				x
100	115	152				
100	115	162				x
125	141	182				
125	141	192				x
150	169	207				
150	169	218				x
200	220	262				
200	220	273				x
250	274	318				
250	274	328			x	
250	274	330				
300	325	373				
300	325	378			x	
300	325	385				
400	420	473				
400	420	490			x	
400	420	497				
500	520	578				
500	520	595			x	
500	520	618				
600	620	680				
600	620	695			x	
600	620	735				
700	720	785				
700	720	810			x	
700	720	805				

8.2. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 2.5	6	10	16
800	820	890				
800	820	915			x	
800	820	910				
900	920	990				
900	920	1015			x	
900	920	1010				
1000	1020	1090				
1000	1020	1120			x	
1000	1020	1125				
1200	1220	1290				
1200	1220	1305				
1200	1220	1340			x	

8.3. Areas of use

For details of the areas of use applicable for the gasket described, see Subsection 2.4.

8.4. Description

The material to be used for these gasket rings (see Subsection 7.1) must be able to meet the following pressure/temperature ratio.

Temp. - °C	- 100	0	50	100	150	max. 200
Pressure - bar	33	32	29	27	23	9

9. GASKET TYPE “HYPALON”

9.1. Material

“Hypalon” chlorosulfonyl polyethylene (CSM):

Non-ageing rubber sheet gasket without ply.

9.2. Sheet gasket

Dimensions:

Standard dimensions	: “Hypalon” to be supplied on a roll on the basis of the following dimensions: – up to and including 5-mm plate thickness : 1350 mm wide x 10 m long – above 5-mm plate thickness : 1000 mm wide x 5 m long
AGB number	: For a plate thickness of 3 mm : 85.13.84.210.6 : For a plate thickness of 8 mm : 85.13.84.215.5

9.3. Gasket rings

Suitable for DIN 2501 - PN 10/16 clad and plastic flanged joints.

All of the dimensions included in the table are based on DIN 2690.

DN	d1	d2	DIN 2501 - PN 10	DIN 2501 - PN 16
15	22	50		x
20	28	60		x
25	35	70		x
32	43	82		x
40	49	92		x
50	61	107		x

9.3. Dimensions (continued):

Sizes in mm

DN	d1	d2	DIN 2501 - PN 10	DIN 2501 - PN 16
65	77	127		x
80	90	142		x
100	115	162		x
125	141	192		x
150	169	218		x
200	220	273		x
250	274	328	x	
300	325	378	x	
350	368	438	x	
400	420	490	x	
500	520	595	x	
600	620	695	x	
700	720	810	x	
800	820	915	x	
900	920	1015	x	
1000	1020	1120	x	
1200	1220	1340	x	

9.4. Fields of application

For details of the fields of application applicable for the gasket rings described, see Subsection 2.8.
Rings suitable for fitting between the flange bolts.

9.5. Description

The material “Hypalon” (CSM) must meet the following minimum requirements:

Temperature limits	: - 20 °C to + 110 °C
Density	: approx. 1.5
Hardness	: 75º shore

10. GASKET TYPE “NBR”

10.1. Material

“NBR” (Nitrile Butadiene Rubber) with ply (or plies).

10.2. Sheet gasket

Dimensions:

Standard dimensions	: “NBR” to be supplied on a roll with the following dimensions: – width : 1400 mm – length : depending on the plate thickness
AGB number for:	plate thickness 2 mm : 85.13.92.048.5 plate thickness 3 mm : 85.13.92.050.6 plate thickness 4 mm : 85.13.92.051.9 plate thickness 5 mm : 85.13.92.052.2 plate thickness 6 mm : 85.13.92.053.1

10.3. Gasket rings, suitable for DIN 2501 - PN 10/16 flanged joints

All of the dimensions included in the table are based on DIN 2690.

Dimensions

Sizes in mm

DN	d1	d2	DIN 2501 - PN 10	DIN 2501 - PN 16
15	22	50		x
20	28	60		x
25	35	70		x
32	43	82		x
40	49	92		x
50	61	107		x
65	77	127		x
80	90	142		x
100	115	162		x
125	141	192		x
150	169	218		x
200	220	273		x
250	274	328	x	
300	325	378	x	
350	368	438	x	
400	420	490	x	
500	520	595	x	
600	620	695	x	
700	720	810	x	
800	820	915	x	
900	920	1015	x	
1000	1020	1120	x	
1200	1220	1340	x	

10.4. Fields of application

For details of the fields of application applicable for the gasket described, see Subsection 2.8.
Rings suitable for fitting between the flange bolts.

10.5. Description

The material “NBR” must meet the following minimum requirements:

Temperature limits	: - 15 °C to +18 °C
Density	: approx. 1.5
Hardness	: 70º shore

11. REFERENCES

Reference is made to the following in this Technical Directive

DIN
- 2690
- 2501
- 52913
- 3535/4

ASTM
- F 36A
- F 152
- F 146
- F 433
- F 607

BS 5146/1

“Rules for pressure vessels” (RToD) sheet D 0701

EN 10088

12. DECLARATION

Version 1.0:
This Technical Directive replaces Tata Steel standards

85.00.01.002
85.00.01.003
85.00.01.004
85.00.01.005
85.00.01.006
85.00.01.026
85.00.01.027
85.00.73.100

Version 1.1:
Logo changed.