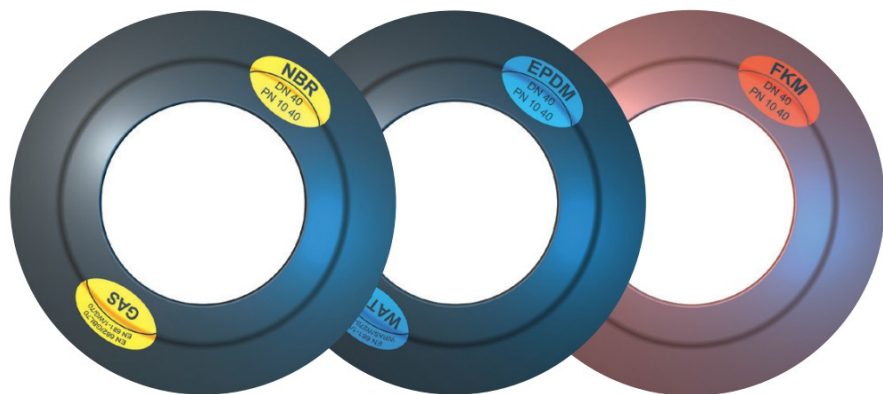


Gomma Metallo EPDM-NBR-FKM



KGS GII NBR

Especially for gas lines. Excellent suitability for hydrogen H₂. Can also be used for waste water.

KGS GII EPDM

For drinking water and process water. Above ground and buried piping.

KGS GII FKM

Chemistry/chemical plant construction. Easiest and safest installations well as maximum tightness very low or high surface pressures

Rubber-metal-gaskets are used where safe sealing of conventional up to special industrial media such as gases and liquids are required under usual installation conditions like temperatures, pressures and forces.

KLINGER®KGS / KGS GII gaskets are suitable for all flange materials.

A flange connection has to be always treated as a coherent system, because the sealing functions is determined by the interaction of individual elements including flanges, gaskets and screws (clamping elements – VDI 2290).

Fields of application

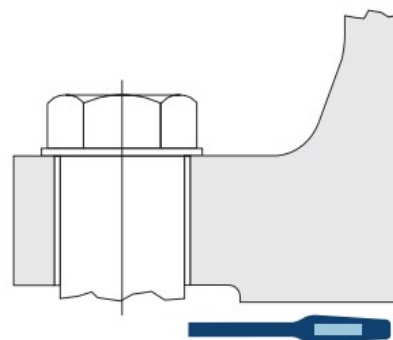
Safe sealing of water, gas, air, acids, alkalis and hydrocarbons with low sealing forces at temperatures up to 200°C, depending on the elastomer type.

With the following media

- Water
- Gas
- Waste water
- Chemicals

With the following flanges made of

- Steel/stainless steel
- Cast iron
- GRP
- PP/PVC/PE



Ordering example:

KLINGER®KGS GII made of NBR according to DIN EN 1514-1
Form IBC
DN 100, PN 10-16

¹I valori qui indicati sono indicati a scopo orientativo e sono da considerare come una linea guida per la selezione del materiale e non una verità assoluta. I parametri descritti sono riferiti a prove eseguite in determinate condizioni e con determinate caratteristiche della guarnizione, del giunto, dal tipo di serraggio e dallo shock termico/meccanico. per cui possono essere indicati soltanto a scopo orientativo. **La Società non assume alcuna responsabilità però un impiego non appropriato del prodotto.**

In genere i limiti di temperatura e pressione di esercizio non valgono simultaneamente. Essi, inoltre, dipendono da una varietà di fattori (stato dei giunti, dimensioni, serraggio, fluido, shock termici o meccanici) per cui possono essere indicati soltanto a scopo orientativo.

Materials:

NBR



Field of application:

Gas
Media containing hydrocarbon
Waste water
Water

Colour: Black

Temperature:

from -15°C to +100°C

Approvals and Certificates:

DVGW-Certificate according to
EN 682 GBL
EN 681-1 WG Class 70
EN 682 GBL Class 70
TA-Luft (Clean Air Act)

Applications:

Applications of NBR vulcanized materials result from the listed characteristics, such as resistance against aliphatic carbohydrates, mineral oils, greases fuels.

EPDM



Field of application:

Drinking water
Waste water
Process water, on consultation

Colour: Black

Temperature:

from -40°C to +110°C, short-term up to +130°C

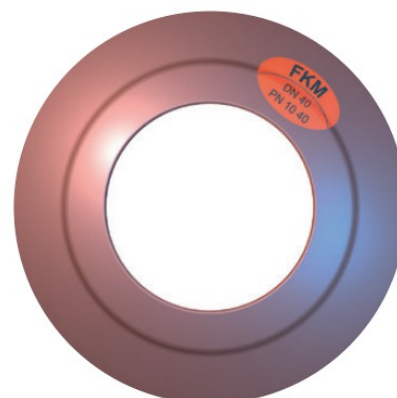
Approvals and Certificates:

EN 681-1 WAL/WCL Class 70
Elastomer-Guideline (new KTW)
DVGW W270
ACS, WRAS (BS6920)
TA-Luft (Clean Air Act)
DM174

Applications:

Applications of EPDM vulcanized materials mainly result from the good resistance to chemicals. Furthermore, the EPDM quality has a good resistance against ozone and aging.

FKM



Field of application:

Application in case of higher temperatures (Viton is the brand name of DuPont® for FKM) in the chemical industry

Colour: Brown

Temperature:

from -20°C to +200°C

Applications:

Due to the good resistance against acids and alkalis, the main use is in the area of chemistry and their users.

Istruzioni di montaggio

Per un corretto montaggio delle nostre guarnizioni Gomma-Metallo seguire le seguenti regole:

- 1) Scegliere la giusta tipologia di gomma in base al fluido ed alle certificazioni richieste.
- 2) Le flange devono essere parallele, pulite ed asciutte e la guarnizione deve essere montata ben centrata (assicurarsi che le dimensioni delle guarnizioni siano corrette con la flangia, il diametro esterno della guarnizione deve combaciare con il bulloni per garantire il corretto centraggio).
- 3) Non utilizzare grassi, olii o paste sulla guarnizione.
- 4) I bulloni devono essere serrati uniformemente in due e tre fasi incrociate.
- 5) Utilizzare i fattori di serraggio indicati in seguito
- 6) Generalmente, per ovvie ragioni, il riutilizzo di guarnizioni usate è altamente sconsigliato.

TABELLA DIMENSIONALE

DN	Inside diameter	Outside diameter for PN						thickness t (mm) KGS GII
		1 / 2,5	6	10	16	25	40	
10	18	39	39	46	46	46	46	3
15	22	44	44	51	51	51	51	3
20	27	54	54	61	61	61	61	3
25	34	64	64	71	71	71	71	3
32	43	76	76	82	82	82	82	3
40	49	86	86	92	92	92	92	3
50	61	96	96	107	107	107	107	3
60	72	106	106	117	117	117	117	3
65	77	116	116	127	127	127	127	3
80	89	132	132	142	142	142	142	3
100	115	152	152	162	162	168	168	3
125	141	182	182	192	192	194	194	3
150	169	207	207	218	218	224	224	3
200	220	262	262	273	273	284	290	3
250	273	317	317	328	329	340	352	4
300	324	373	373	378	384	400	417	4
350	356	423	423	438	444	457	474	5
400	407	473	473	489	495	514	546	5
450	458	528	528	539	555	564	571	5
500	508	578	578	594	617	624	628	5
600	610	679	679	695	734	731	747	5
700	712	784	784	810	804	833	–	6
800	813	890	890	917	911	942	–	6
900	915	990	990	1017	1011	1042	–	6
1000	1016	1090	1090	1124	1128	1154	–	6
1100	1120	–	–	1231	1228	1251	–	7
1200	1220	1290	1307	1341	1342	1364	–	7
1400	1420	1490	1524	1548	1542	1578	–	7
1500	1520	–	–	1658	1654	1688	–	7
1600	1620	1700	1724	1772	1764	1798	–	7
1800	1820	1900	1931	1972	1964	2000	–	7
2000	2020	2100	2138	2182	2168	2230	–	7

Tolleranze dimensionali secondo specifica Europea DIN ISO 3302-1, M3 C

Installation instructions for rubber-metal-gaskets

The following instructions have to be observed so that a reliable sealing connection can be ensured.

1. Gasket selection

The suitable material quality can be selected from the information sheet – above all, from the resistance chart.

2. Flanges

Flanges should be parallel, metallic, clean and dry, the gasket has to be mounted centrally. Please ensure the correct gasket dimensions. The gasket should never tower into the throughhole (media flow)!

The outer diameter of the KGS GII gasket is adapted to the bolt circle of the flange. Therefore safe centering at the screws is ensured.

3. Installation

The installation of the gaskets should be carried out without using any grease or oil containing separating/sealing agents or similar, because they have a negative influence on the safety of the whole flange connection.

4. Screws

When installing the screws, they have to be tightened evenly in two to three steps crosswise. The screws should be lubricated. Pay attention to the tightening torques.

5. Retightening

“Retightening” is not required if these instructions are followed.

6. Multiple use

For reasons of safety, the multiple use of gaskets is generally not recommended.

Media resistance of rubber-metal-gaskets

Medium	NR	NBR	EPDM	CSM	FKM
Acetaldehyde	●	▲	●	■	▲
Acetamide	▲	●	●	■	■
Acetic acid	■	▲	●	▲	▲
Acetic acid ester	▲	▲	●	●	▲
Acetone	●	▲	●	■	●
Acetylene	●	●	●	●	●
Adipic acid	●	●	●	●	●
Air	▲	▲	●	■	●
Alum	●	●	●	●	●
Aluminium acetate	●	●	●	■	▲
Aluminium chlorate	■	●	●	■	■
Aluminium chloride	●	●	●	●	●
Ammonia	■	■	●	●	▲
Ammonium carbonate	●	■	●	●	■
Ammonium chloride	●	●	●	●	■
Ammonium diphosphate	■	●	●	■	■
Ammonium hydroxide	■	■	●	●	■
Amyl acetate	■	▲	●	▲	▲
Aniline	■	▲	●	▲	●
Anon cyclohexanone	▲	▲	■	▲	▲
Arcton 12	■	●	■	■	●
Arcton 22	●	▲	●	●	▲
Asphalt	▲	▲	▲	▲	●
Aviation fuel	▲	●	▲	▲	●
Barium chloride	●	●	●	●	●
Benzene	▲	▲	▲	▲	●
Benzoic acid	●	●	●	●	●
Blast furnace gas	▲	▲	▲	▲	■
Bleaching solution	▲	▲	●	●	●
Boiler feed water	▲	■	●	▲	■
Borax	●	●	●	●	●
Boric acid	●	●	●	●	●
Brine	■	●	●	●	●
Butane	▲	●	▲	■	●
Butanol	●	■	●	■	●
Butanone	▲	▲	●	■	▲
Butyl acetate	▲	▲	●	▲	▲
Butylamine	▲	●	▲	▲	▲
Butyle alcohol	●	■	●	●	●
Butyric acid	▲	▲	●	▲	■
Caesium melt	▲	▲	▲	▲	▲
Calcium chloride	●	●	●	●	●
Calcium hydroxide	●	●	●	●	●
Calcium hypochlorit	▲	▲	●	●	●
Calcium sulphate	■	●	●	■	■
Carbolic acid	▲	▲	■	▲	●
Carbon dioxide	●	●	●	●	●
Carbon disulphide	▲	▲	▲	▲	●
Carbon tetrachlorid	▲	▲	▲	▲	●
Castor oil	●	●	●	●	●
Chlorine water	▲	▲	■	▲	●
Chlorine, dry	▲	▲	■	▲	●
Chlorine, moist	▲	▲	■	▲	●
Chloroform	▲	▲	▲	▲	●
Chromic acid	▲	▲	■	■	●
Citric acid	●	●	●	●	●

Medium	NR	NBR	EPDM	CSM	FKM
Clorotrifluoride	▲	▲	▲	▲	▲
Condensation water	▲	●	●	▲	■
Copper acetate	■	■	●	■	▲
Copper sulphate	●	●	●	●	●
Creosote	▲	▲	■	■	●
Cresol	▲	▲	▲	▲	●
Crude oil	▲	●	▲	■	●
Cyclohexanol	▲	●	▲	■	●
Decahydronaphthalen	▲	■	▲	▲	●
Dibenzyl ether	▲	▲	■	▲	●
Dibutyl phthalate	▲	▲	●	▲	■
Diesel oil	▲	●	▲	▲	●
Dimethyl formamide	▲	▲	●	▲	▲
Diphyll	▲	▲	▲	▲	●
Ethane	▲	●	▲	■	●
Ethanol	●	■	●	●	●
Ethyl acetate	▲	▲	●	▲	▲
Ethyl alcohol	●	■	●	▲	●
Ethyl chloride	▲	■	■	▲	●
Ethyl ether	▲	▲	▲	▲	▲
Ethylendiamine	●	●	●	■	▲
Ethylene	▲	●	▲	▲	▲
Ethylene chloride	▲	▲	▲	▲	●
Ethylene glycol	●	●	●	●	●
Fluorine dioxide	■	▲	▲	■	■
Fluorine gaseous	■	▲	▲	■	■
Fluorine liquid (dry)	▲	▲	▲	▲	■
Fluorosilicic acid	▲	▲	▲	▲	■
Formaldehyde	●	●	●	●	■
Formamide	●	▲	●	●	■
Formic acid 10%	■	▲	●	●	▲
Freon 12	■	●	■	●	■
Freon 22	■	▲	●	●	▲
Fuel oil (crude oil basis)	▲	●	▲	▲	●
Generator gas	■	●	▲	▲	▲
Glacial acetio acid	■	▲	●	▲	▲
Glycerin	●	●	●	●	●
Heating oil	▲	●	▲	▲	●
Heptane	▲	●	▲	▲	●
Hydraulic oil (mineral-based)	▲	●	▲	▲	●
Hydraulic oil (phosphat ester)	▲	▲	●	▲	●
Hydrazine hydrate	▲	■	●	■	▲
Hydrochloric acid (10%)	■	■	●	●	●
Hydrochloric acid (37%)	▲	▲	●	▲	▲
Hydrofluorid acid	▲	▲	●	●	●
Hydrofluosilic acid	●	▲	●	●	●
Hydrogen	●	●	●	●	●
Hydrogen chloride (dry)	■	▲	●	●	●
Hydrogen peroxide 3%	■	■	●	●	●
Hydrogen peroxide 90%	▲	▲	▲	▲	●
Hydrogen sulfide	▲	▲	●	▲	▲
Isooctane	▲	●	▲	■	●
Isopropyl alcohol	●	■	●	●	●
Kerosene	▲	●	▲	▲	●
Lactic acid	●	●	●	●	●
Lead acetate	●	■	●	▲	▲

Media resistance of rubber-metal-gaskets

Medium	NR	NBR	EPDM	CSM	FKM
Lead arsenate		●	●		
Linseed oil	▲	●	▲	▲	●
Lithium melt	▲	▲	▲	▲	▲
Magnesium sulphate	●	●	●	●	●
Malic acid	▲	●	●	●	●
MEK butanone	▲	▲	●	▲	▲
Methane	▲	●	▲	▲	●
Methyl alcohol	●	▲	●	●	▲
Methyl chloride	▲	▲	▲	▲	●
Methylene chloride	▲	▲	▲	▲	▲
Mineral oil	▲	●	▲	▲	●
Monochlorethane	▲	▲	▲	▲	●
Naphtha	▲	▲	▲	▲	▲
Natural gas	▲	●	▲	▲	●
Nitric acid	▲	▲	▲	▲	●
Nitrobenzene	▲	▲	▲	▲	●
Nitrogen	●	●	●	●	●
Octane (n)	▲	▲	▲	▲	●
Oil	▲	●	▲	▲	●
Oleanolic Acid	▲	▲	▲	▲	●
Oleic acid	▲	▲	▲	▲	●
Oxalic acid	▲	▲	●	▲	●
Oxygen, gaseous, cold	▲	▲	●	▲	●
Palmitic acid	▲	●	▲	▲	●
Patable water	●	●	●	●	●
Pentane	▲	●	▲	▲	●
Perchlorethylene	▲	▲	▲	▲	●
Petroleum	▲	●	▲	▲	●
Petroleum benzin	▲	▲	▲	▲	●
Petrol ether	▲	●	▲	▲	●
Phenol	▲	▲	▲	▲	●
Phosphoric acid	▲	▲	▲	▲	●
Polychl.biphenyls.	▲	▲	▲	▲	●
Potassium chromium sulphate		▲	●		●
Potassium acetate	●	▲	●	▲	▲
Potassium carbonate	●	●	●	●	●
Potassium chlorate	▲	▲	●	●	●
Potassium chloride	●	●	●	●	●
Potassium cyanide	▲	▲	●	●	●
Potassium dichrom.	▲	▲	●	●	●
Potassium hydroxide	▲	▲	●	●	▲
Potassium hypochlorite		▲	▲		
Potassium iodide	●	●	●	●	●
Potassium melt	▲	▲	▲	▲	▲
Potassium nitrate	▲	●	●	●	▲
Potassium nitrite	●	●	●	●	●
Potassium permanganate	▲	▲	●	●	●
Propane	▲	●	▲	▲	●
Pydraul C	▲	▲	▲	▲	●
Pydraul E	▲	▲	▲	▲	●
Pyridine	▲	▲	▲	▲	▲
Rape seed oil	▲	●	▲	▲	●
Rubidium melt	▲	▲	▲	▲	▲
Salicylic acid	●	●	●	●	●
Sea water	●	●	●	●	▲
Silicon oil	●	●	●	●	●

Medium	NR	NBR	EPDM	CSM	FKM
Skydrol 500, 7000	▲	▲	●	▲	▲
Soap, solution	▲	●	●	●	●
Soda	●	●	●	●	●
Sodium aluminate		▲	▲		
Sodium bicarbonate	●	●	●	●	●
Sodium bisulphite	▲	●	●	●	●
Sodium chloride	●	●	●	●	●
Sodium cyanide	●	●	●	●	●
Sodium hydroxide	▲	▲	●	●	▲
Sodium melt	▲	▲	▲	▲	▲
Sodium silicate	●	●	●	●	●
Sodium sulfide	▲	●	●	●	●
Sodium sulphate	●	●	●	●	●
Spirit	●	▲	●	●	●
Starch	●	●	●	●	●
Steam (max. 150 °C)	▲	▲	●	▲	▲
Stearic acid 100°C	▲	▲	▲	▲	●
Sugar	●	●	●	●	●
Sulphur dioxide	▲	▲	●	▲	●
Sulphuric acid	▲	▲	▲	▲	●
Sulphurous acid	▲	▲	●	●	●
Table salt	●	●	●	●	●
Tannic acid	●	●	●	●	●
Tannin	●	●	●	▲	●
Tar	▲	▲	▲	▲	●
Tartaric acid	●	●	●	●	●
Tetrachloroethane	▲	▲	▲	▲	▲
Tetrahydronaphthale	▲	▲	▲	▲	●
Toluene	▲	▲	▲	▲	●
Town gas (benzene free)	▲	●	▲	▲	●
Transformer oil	▲	●	▲	▲	●
Trichloroethylene	▲	▲	▲	▲	●
Triethanolamine	▲	▲	▲	▲	▲
Turpentine	▲	▲	▲	▲	●
Urea	●	●	●	●	●
Vinyl acetate	▲	▲	▲	▲	▲
Water 100°C	▲	▲	●	▲	▲
Water flask	●	●	●	●	●
Water vapour (max. 150°C)	▲	▲	●	▲	▲
White spirit	▲	▲	▲	▲	●
Xylene	▲	▲	▲	▲	●

It is not possible to select the right sealing material by just using this media resistance table! Please use the documentation for making a safe decision.

Subject to technical changes.
Status: 04.2023

▲ Not recommended
▲ Conditionally recommended
● Resistant

BOOKLET OF ASSEMBLY TORQUES

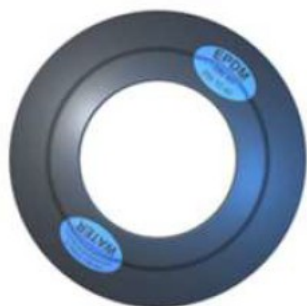
General information to torque-tables of KGS GII gasket for carbon steel screws:

Calculation basis	:	- Dimension	: gaskets acc. DIN EN 1514-1, Type IBC
		- Flanges	: acc. DIN EN 1092-1
		- Mounting	: Usage of washers
		- Friction	: $\mu = 0,14$
		- Temperature	: + 25 °C
		- Pressure	: equal to design PN (PN 10 means 10 [bar])
		- Medium	: Water
		- Aggregate state	: liquid
		- Screw quality	: 5.6 (mild steel) and 8.8 (high strength steel)

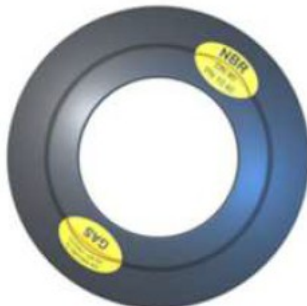
NOTIFICATION : Minimum yield for a safe bolt-/nut-connection should be 30%!
Otherwise there may be caused a problem by self rewinding of the nut caused by process-/pipe-vibration!

Maximum yield for a safe bolt-/nut-connection should be 80%!
Otherwise a proper calculation will be more difficult!

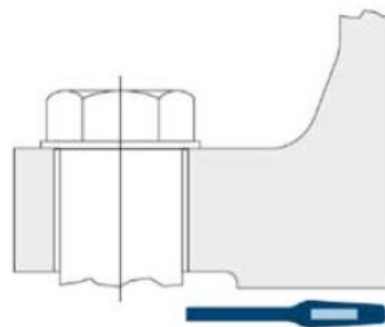
Torque Tables min /Max Gasket in NBR or EPDM Elastomer for carbon steel screws quality 5.6 | 8.8 | A2-70 / A2-50



KGS GII / EPDM



KGS GII / NBR



DN	n _{pcs} x M _{screw} [mm]	Flange PN 6 / Torque [Nm] Minimum to Maximum	5.6 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M10	10 - 17	30 - 51	24 - 40
20	4 x M10	10 - 27	30 - 78	15 - 40
25	4 x M10	10 - 27	30 - 80	11 - 30
32	4 x M12	18 - 47	30 - 80	13 - 30
40	4 x M12	18 - 47	30 - 80	10 - 26
50	4 x M12	18 - 47	30 - 80	9 - 24
65	4 x M12	18 - 47	30 - 80	10 - 17
80	4 x M16	42 - 112	30 - 80	9 - 23
100	4 x M16	42 - 112	30 - 80	8 - 22
125	8 x M16	42 - 112	30 - 80	12 - 33
150	8 x M16	42 - 112	30 - 80	12 - 31
200	8 x M16	42 - 112	30 - 80	10 - 21
250	12 x M16	42 - 112	30 - 80	10 - 26
300	12 x M16	82 - 218	30 - 80	12 - 33
350	12 x M16	82 - 218	30 - 80	9 - 24
400	16 x M20	82 - 218	30 - 80	11 - 30
500	20 x M20	82 - 218	30 - 80	10 - 27
600	20 x M24	142 - 378	30 - 80	13 - 33
800	24 x M27	206 - 549	30 - 80	12 - 33
1000	28 x M27	206 - 549	30 - 80	10 - 31
1200	32 x M30	281 - 748	30 - 80	10 - 29
1400	36 x M33	378 - 1007	30 - 80	10 - 29

DN	n _{pcs} x M _{screw} [mm]	Flange PN 10 / Torque [Nm] Minimum to Maximum	5.6 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	18 - 28	30 - 48	25 - 40
20	4 x M12	18 - 47	30 - 80	15 - 40
25	4 x M12	18 - 47	30 - 80	11 - 30
32	4 x M16	42 - 100	30 - 71	17 - 40
40	4 x M16	42 - 112	30 - 80	13 - 36
50	4 x M16	42 - 112	30 - 80	11 - 29
65	8 x M16	42 - 112	30 - 80	8 - 21
80	8 x M16	42 - 112	30 - 80	13 - 35
100	8 x M16	42 - 112	30 - 80	12 - 33
125	8 x M16	42 - 112	30 - 80	9 - 25
150	8 x M20	82 - 218	30 - 80	14 - 37
200	8 x M20	82 - 218	30 - 80	10 - 26
250	12 x M20	82 - 218	30 - 80	12 - 33
300	12 x M20	82 - 218	30 - 80	10 - 29
350	16 x M20	82 - 218	30 - 80	10 - 24
400	16 x M24	142 - 378	30 - 80	12 - 31
500	20 x M24	142 - 378	30 - 80	11 - 30
600	20 x M27	206 - 549	30 - 80	10 - 33
800	24 x M30	281 - 748	30 - 80	10 - 28
1000	28 x M33	378 - 1007	30 - 80	10 - 31
1200	32 x M36	487 - 1299	30 - 80	10 - 28
1400	36 x M39	628 - 1674	30 - 80	10 - 32

DN	n _{pcs} x M _{screw} [mm]	Flange PN 16 / Torque [Nm] Minimum to Maximum	5.6 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	18 - 28	30 - 48	25 - 40
20	4 x M12	18 - 47	30 - 80	15 - 40
25	4 x M12	18 - 47	30 - 80	11 - 30
32	4 x M16	42 - 100	30 - 71	17 - 40
40	4 x M16	42 - 112	30 - 80	13 - 36
50	4 x M16	42 - 112	30 - 80	11 - 29
65	8 x M16	42 - 112	30 - 80	8 - 21
80	8 x M16	42 - 112	30 - 80	13 - 35
100	8 x M16	42 - 112	30 - 80	12 - 33
125	8 x M16	42 - 112	30 - 80	10 - 25
150	8 x M20	82 - 218	30 - 80	14 - 37
200	12 x M20	82 - 218	30 - 80	14 - 38
250	12 x M24	142 - 321	30 - 68	18 - 40
300	12 x M24	142 - 378	30 - 80	13 - 35
350	16 x M24	142 - 378	30 - 80	10 - 31
400	16 x M27	206 - 549	30 - 80	13 - 35
500	20 x M30	281 - 748	30 - 80	13 - 34
600	20 x M33	378 - 1007	30 - 80	10 - 30
800	24 x M36	487 - 1201	30 - 74	10 - 40
1000	28 x M39	628 - 1632	30 - 78	10 - 40
1200	32 x M45	969 - 2262	30 - 70	10 - 40
1400	36 x M45	969 - 2359	30 - 73	10 - 40

DN	n _{pcs} x M _{screw} [mm]	Flange PN 25 / Torque [Nm] Minimum to Maximum	5.6 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	18 - 28	30 - 48	25 - 40
20	4 x M12	18 - 47	30 - 80	15 - 40
25	4 x M12	18 - 47	30 - 80	11 - 30
32	4 x M16	42 - 100	30 - 71	17 - 40
40	4 x M16	42 - 112	30 - 80	13 - 36
50	4 x M16	42 - 112	30 - 80	11 - 29
65	8 x M16	42 - 112	30 - 80	8 - 21
80	8 x M16	42 - 112	30 - 80	13 - 35
100	8 x M20	82 - 190	30 - 69	17 - 40
125	8 x M24	142 - 274	30 - 58	21 - 40
150	8 x M24	142 - 335	30 - 71	17 - 40
200	12 x M24	142 - 340	30 - 72	17 - 40
250	12 x M27	206 - 487	30 - 71	17 - 40
300	16 x M27	206 - 494	30 - 72	17 - 40
350	16 x M30	281 - 739	30 - 79	15 - 40
400	16 x M33	378 - 944	30 - 75	16 - 40
500	20 x M33	378 - 1007	30 - 80	15 - 39
600	20 x M36	487 - 1299	30 - 80	14 - 37
800	24 x M45	969 - 2101	30 - 65	19 - 40
1000	28 x M52	1500 - 2749	30 - 55	22 - 40

DN	n _{pcs} x M _{screw} [mm]	Flange PN 40 / Torque [Nm] Minimum to Maximum	5.6 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	18 - 28	30 - 48	25 - 40
20	4 x M12	18 - 47	30 - 80	15 - 40
25	4 x M12	18 - 47	30 - 80	11 - 30
32	4 x M16	42 - 100	30 - 71	17 - 40
40	4 x M16	42 - 112	30 - 80	13 - 36
50	4 x M16	42 - 112	30 - 80	11 - 29
65	8 x M16	42 - 112	30 - 80	8 - 21
80	8 x M16	42 - 112	30 - 80	13 - 35
100	8 x M20	82 - 191	30 - 70	17 - 40
125	8 x M24	142 - 274	30 - 58	21 - 40
150	8 x M24	142 - 335	30 - 71	17 - 40
200	12 x M27	206 - 432	30 - 63	19 - 40
250	12 x M30	281 - 646	30 - 69	18 - 40
300	16 x M30	281 - 683	30 - 73	16 - 40
350	16 x M33	378 - 969	30 - 77	16 - 40
400	16 x M36	487 - 1299	30 - 80	14 - 36
500	20 x M39	628 - 1214	30 - 58	21 - 40

DN	n _{pcs} x M _{screw} [mm]	Flange PN 6 / Torque [Nm] Minimum to Maximum	8.8 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M10	22	30	51
20	4 x M10	22 - 26	30 - 36	33 - 40
25	4 x M10	22 - 36	30 - 50	24 - 40
32	4 x M12	37 - 55	30 - 54	27 - 40
40	4 x M12	37 - 72	30 - 58	21 - 40
50	4 x M12	37 - 80	30 - 64	19 - 64
65	4 x M12	38 - 100	30 - 80	13 - 36
80	4 x M16	90 - 194	30 - 65	19 - 40
100	4 x M16	90 - 203	30 - 68	18 - 40
125	8 x M16	90 - 138	30 - 46	26 - 40
150	8 x M16	90 - 144	30 - 48	25 - 40
200	8 x M16	90 - 212	30 - 71	17 - 40
250	12 x M16	90 - 173	30 - 58	21 - 40
300	12 x M16	174 - 267	30 - 46	26 - 40
350	12 x M16	174 - 354	30 - 61	20 - 40
400	16 x M20	174 - 290	30 - 50	24 - 40
500	20 x M20	174 - 319	30 - 55	22 - 40
600	20 x M24	302 - 453	30 - 45	27 - 40
800	24 x M27	439 - 673	30 - 46	26 - 40
1000	28 x M27	439 - 702	30 - 48	25 - 40
1200	32 x M30	599 - 1018	30 - 51	23 - 40
1400	36 x M33	806 - 1397	30 - 52	23 - 40
1600	40 x M33	806 - 1423	30 - 53	23 - 40

DN	n _{pcs} x M _{screw} [mm]	Flange PN 10 / Torque [Nm] Minimum to Maximum	8.8 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	37	30	53
20	4 x M12	37 - 47	30 - 38	32 - 40
25	4 x M12	37 - 62	30 - 50	24 - 40
32	4 x M16	90 - 99	30 - 33	36 - 40
40	4 x M16	90 - 126	30 - 42	29 - 40
50	4 x M16	90 - 156	30 - 52	23 - 40
65	8 x M16	90 - 210	30 - 70	17 - 40
80	8 x M16	90 - 129	30 - 43	28 - 40
100	8 x M16	90 - 137	30 - 46	26 - 40
125	8 x M16	90 - 180	30 - 60	20 - 40
150	8 x M20	174 - 238	30 - 41	29 - 40
200	8 x M20	174 - 337	30 - 41	20 - 40
250	12 x M20	174 - 267	30 - 46	26 - 40
300	12 x M20	174 - 302	30 - 52	23 - 40
350	16 x M20	174 - 360	30 - 62	19 - 40
400	16 x M24	302 - 494	30 - 49	25 - 40
500	20 x M24	302 - 504	30 - 50	24 - 40
600	20 x M27	439 - 658	30 - 45	26 - 40
800	24 x M30	599 - 1058	30 - 53	22 - 40
900	28 x M30	599 - 1018	30 - 51	23 - 40
1000	28 x M33	806 - 1316	30 - 49	25 - 40
1200	32 x M36	1039 - 1836	30 - 53	23 - 40
1400	36 x M39	1339 - 2143	30 - 48	25 - 40
1600	40 x M45	2068 - 3033	30 - 44	27 - 40
1800	44 x M45	2068 - 3102	30 - 45	27 - 40

DN	n _{pcs} x M _{screw} [mm]	Flange PN 16 / Torque [Nm] Minimum to Maximum	8.8 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	37	30	53
20	4 x M12	37 - 47	30 - 38	32 - 40
25	4 x M12	37 - 62	30 - 50	24 - 40
32	4 x M16	90 - 99	30 - 33	36 - 40
40	4 x M16	90 - 126	30 - 42	29 - 40
50	4 x M16	90 - 156	30 - 52	23 - 40
65	8 x M16	90 - 210	30 - 70	17 - 40
80	8 x M16	90 - 129	30 - 43	28 - 40
100	8 x M16	90 - 138	30 - 46	26 - 40
125	8 x M16	90 - 180	30 - 60	20 - 40
150	8 x M20	174 - 238	30 - 41	29 - 40
200	12 x M20	174 - 227	30 - 39	31 - 40
250	12 x M24	302 - 322	30 - 32	38 - 40
300	12 x M24	302 - 433	30 - 43	28 - 40
350	16 x M24	302 - 494	30 - 49	24 - 40
400	16 x M27	439 - 629	30 - 43	28 - 40
500	20 x M30	599 - 898	30 - 45	27 - 40
600	20 x M33	806 - 1343	30 - 50	24 - 40
800	24 x M36	1039 - 1212	30 - 35	35 - 40
1000	28 x M39	1339 - 1607	30 - 36	33 - 40
1200	32 x M45	2068 - 2275	30 - 33	36 - 40
1400	36 x M45	2068 - 2343	30 - 34	35 - 40
1600	40 x M52	3199 - 3306	30 - 31	39 - 41

DN	n _{pcs} x M _{screw} [mm]	Flange PN 25 / Torque [Nm] Minimum to Maximum	8.8 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	37	30	53
20	4 x M12	37 - 47	30 - 38	32 - 40
25	4 x M12	37 - 62	30 - 50	24 - 40
32	4 x M16	90 - 99	30 - 33	36 - 40
40	4 x M16	90 - 126	30 - 42	29 - 40
50	4 x M16	90 - 156	30 - 52	23 - 40
65	8 x M16	90 - 210	30 - 70	17 - 40
80	8 x M16	90 - 129	30 - 43	28 - 40
100	8 x M20	174 - 192	30 - 33	37 - 40
125	8 x M24	302	30	45
150	8 x M24	302 - 332	30 - 33	36 - 40
200	12 x M24	302 - 337	30 - 34	36 - 40
250	12 x M27	439 - 483	30 - 33	36 - 40
300	16 x M27	439 - 498	30 - 34	36 - 40
350	16 x M30	599 - 739	30 - 37	33 - 40
400	16 x M33	806 - 940	30 - 35	35 - 40
500	20 x M33	806 - 1021	30 - 38	31 - 40
600	20 x M36	1039 - 1385	30 - 40	30 - 40
800	24 x M45	2068	30	40
1000	28 x M52	3199	30	46

DN	n _{pcs} x M _{screw} [mm]	Flange PN 40 / Torque [Nm] Minimum to Maximum	8.8 yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	37	30	53
20	4 x M12	37 - 47	30 - 38	32 - 40
25	4 x M12	37 - 62	30 - 50	24 - 40
32	4 x M16	90 - 99	30 - 33	36 - 40
40	4 x M16	90 - 126	30 - 42	29 - 40
50	4 x M16	90 - 156	30 - 52	23 - 40
65	8 x M16	90 - 210	30 - 70	17 - 40
80	8 x M16	90 - 129	30 - 43	28 - 40
100	8 x M20	174 - 192	30 - 33	37 - 40
125	8 x M24	302	30	45
150	8 x M24	302 - 332	30 - 33	36 - 40
200	12 x M27	439	30	40
250	12 x M30	599 - 639	30 - 32	37 - 40
300	16 x M30	599 - 679	30 - 34	35 - 40
350	16 x M33	806 - 967	30 - 36	34 - 40
400	16 x M36	1039 - 1420	30 - 41	29 - 40
500	20 x M39	1339	30	44

DN	n _{pcs} x M _{screw} [mm]	Flange PN 6 / Torque [Nm] Minimum to Maximum	A2-70 (≤ M30) / A2-50 (> M30) yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M10	15 - 18	30 - 34	36 - 40
20	4 x M10	15 - 26	30 - 51	23 - 40
25	4 x M10	15 - 36	30 - 71	17 - 40
32	4 x M12	26 - 55	30 - 63	19 - 40
40	4 x M12	26 - 73	30 - 83	14 - 40
50	4 x M12	26 - 70	30 - 80	13 - 35
65	4 x M12	26 - 70	30 - 80	9 - 25
80	4 x M16	63 - 168	30 - 80	13 - 35
100	4 x M16	63 - 168	30 - 80	12 - 33
125	8 x M16	63 - 139	30 - 66	18 - 40
150	8 x M16	63 - 143	30 - 68	18 - 40
200	8 x M16	63 - 168	30 - 80	12 - 32
250	12 x M16	63 - 168	30 - 80	15 - 39
300	12 x M16	122 - 265	30 - 65	18 - 40
350	12 x M16	122 - 327	30 - 80	14 - 37
400	16 x M20	122 - 290	30 - 71	17 - 40
500	20 x M20	122 - 319	30 - 78	15 - 40
600	20 x M24	118 - 315	30 - 80	10 - 23
800	24 x M27	171 - 457	30 - 80	10 - 28
1000	28 x M27	172 - 457	30 - 80	10 - 26
1200	32 x M30	234 - 624	30 - 80	9 - 24

DN	n _{pcs} x M _{screw} [mm]	Flange PN 10 / Torque [Nm] Minimum to Maximum	A2-70 (≤ M30) / A2-50 (> M30) yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	26 - 28	30 - 32	38 - 40
20	4 x M12	26 - 40	30 - 54	22 - 40
25	4 x M12	26 - 61	30 - 70	17 - 40
32	4 x M16	63 - 99	30 - 47	25 - 40
40	4 x M16	63 - 126	30 - 60	20 - 40
50	4 x M16	63 - 155	30 - 74	16 - 40
65	8 x M16	63 - 168	30 - 80	12 - 32
80	8 x M16	63 - 128	30 - 61	20 - 40
100	8 x M16	63 - 137	30 - 65	18 - 40
125	8 x M16	63 - 168	30 - 80	14 - 37
150	8 x M20	123 - 241	30 - 59	21 - 40
200	8 x M20	123 - 327	30 - 80	14 - 38
250	12 x M20	123 - 265	30 - 65	18 - 40
300	12 x M20	123 - 306	30 - 75	16 - 40
350	16 x M20	123 - 327	30 - 80	14 - 36
400	16 x M24	118 - 315	30 - 80	10 - 26
500	20 x M24	118 - 315	30 - 80	9 - 25
600	20 x M27	171 - 457	30 - 80	10 - 28
800	24 x M30	234 - 624	30 - 80	9 - 23
1000	28 x M33	264 - 705	30 - 80	8 - 22
1200	32 x M36	341 - 909	30 - 80	7 - 20
1400	36 x M39	439 - 1172	30 - 80	8 - 22

DN	n _{pcs} x M _{screw} [mm]	Flange PN 16 / Torque [Nm] Minimum to Maximum	A2-70 (≤ M30) / A2-50 (> M30) yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	26 - 28	30 - 32	38 - 40
20	4 x M12	26 - 47	30 - 54	22 - 40
25	4 x M12	26 - 61	30 - 70	17 - 40
32	4 x M16	63 - 99	30 - 47	25 - 40
40	4 x M16	63 - 124	30 - 59	20 - 40
50	4 x M16	63 - 155	30 - 74	16 - 40
65	8 x M16	63 - 168	30 - 80	12 - 32
80	8 x M16	63 - 128	30 - 61	20 - 40
100	8 x M16	63 - 136	30 - 65	18 - 40
125	8 x M16	63 - 168	30 - 80	14 - 37
150	8 x M20	122 - 241	30 - 59	21 - 40
200	12 x M20	122 - 229	30 - 56	22 - 40
250	12 x M24	118 - 315	30 - 80	15 - 39
300	12 x M24	118 - 315	30 - 80	11 - 29
350	16 x M24	118 - 315	30 - 80	10 - 25
400	16 x M27	171 - 457	30 - 80	11 - 29
500	20 x M30	234 - 624	30 - 80	11 - 28
600	20 x M33	264 - 705	30 - 80	8 - 21
800	24 x M36	341 - 909	30 - 80	11 - 30
1000	28 x M39	439 - 1172	30 - 80	11 - 29
1200	32 x M45	670 - 1784	30 - 80	12 - 31
1400	36 x M45	670 - 1785	30 - 80	11 - 31

DN	n _{pcs} x M _{screw} [mm]	Flange PN 25 / Torque [Nm] Minimum to Maximum	A2-70 (≤ M30) / A2-50 (> M30) yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	26 - 28	30 - 32	38 - 40
20	4 x M12	26 - 47	30 - 54	22 - 40
25	4 x M12	26 - 62	30 - 71	17 - 40
32	4 x M16	63 - 99	30 - 47	25 - 40
40	4 x M16	63 - 126	30 - 60	20 - 40
50	4 x M16	63 - 158	30 - 75	16 - 40
65	8 x M16	63 - 105	30 - 50	24 - 40
80	8 x M16	63 - 128	30 - 61	20 - 40
100	8 x M20	123 - 188	30 - 46	26 - 40
125	8 x M24	118 - 268	30 - 68	17 - 40
150	8 x M24	118 - 315	30 - 80	14 - 38
200	12 x M24	118 - 315	30 - 80	14 - 37
250	12 x M27	171 - 457	30 - 80	14 - 38
300	16 x M27	171 - 457	30 - 80	14 - 37
350	16 x M30	234 - 624	30 - 80	13 - 34
400	16 x M33	264 - 705	30 - 80	11 - 30
500	20 x M33	264 - 705	30 - 80	10 - 28
600	20 x M36	341 - 909	30 - 80	10 - 26

DN	n _{pcs} x M _{screw} [mm]	Flange PN 40 / Torque [Nm] Minimum to Maximum	A2-70 (≤ M30) / A2-50 (> M30) yield [%] Minimum to Maximum	Gasket Load [Mpa] Minimum to Maximum
15	4 x M12	26 - 28	30 - 32	38 - 40
20	4 x M12	26 - 47	30 - 54	22 - 40
25	4 x M12	26 - 62	30 - 71	17 - 40
32	4 x M16	63 - 99	30 - 47	25 - 40
40	4 x M16	63 - 126	30 - 60	20 - 40
50	4 x M16	63 - 158	30 - 75	16 - 40
65	8 x M16	63 - 105	30 - 50	24 - 40
80	8 x M16	63 - 128	30 - 61	20 - 40
100	8 x M20	123 - 188	30 - 46	26 - 40
125	8 x M24	118 - 268	30 - 68	17 - 40
150	8 x M24	118 - 315	30 - 80	14 - 38
200	12 x M27	171 - 429	30 - 75	16 - 40
250	12 x M30	234 - 624	30 - 80	15 - 39
300	16 x M30	234 - 624	30 - 80	14 - 37
350	16 x M33	264 - 705	30 - 80	11 - 29
400	16 x M36	341 - 909	30 - 80	10 - 25
500	20 x M39	439 - 1172	30 - 80	15 - 39