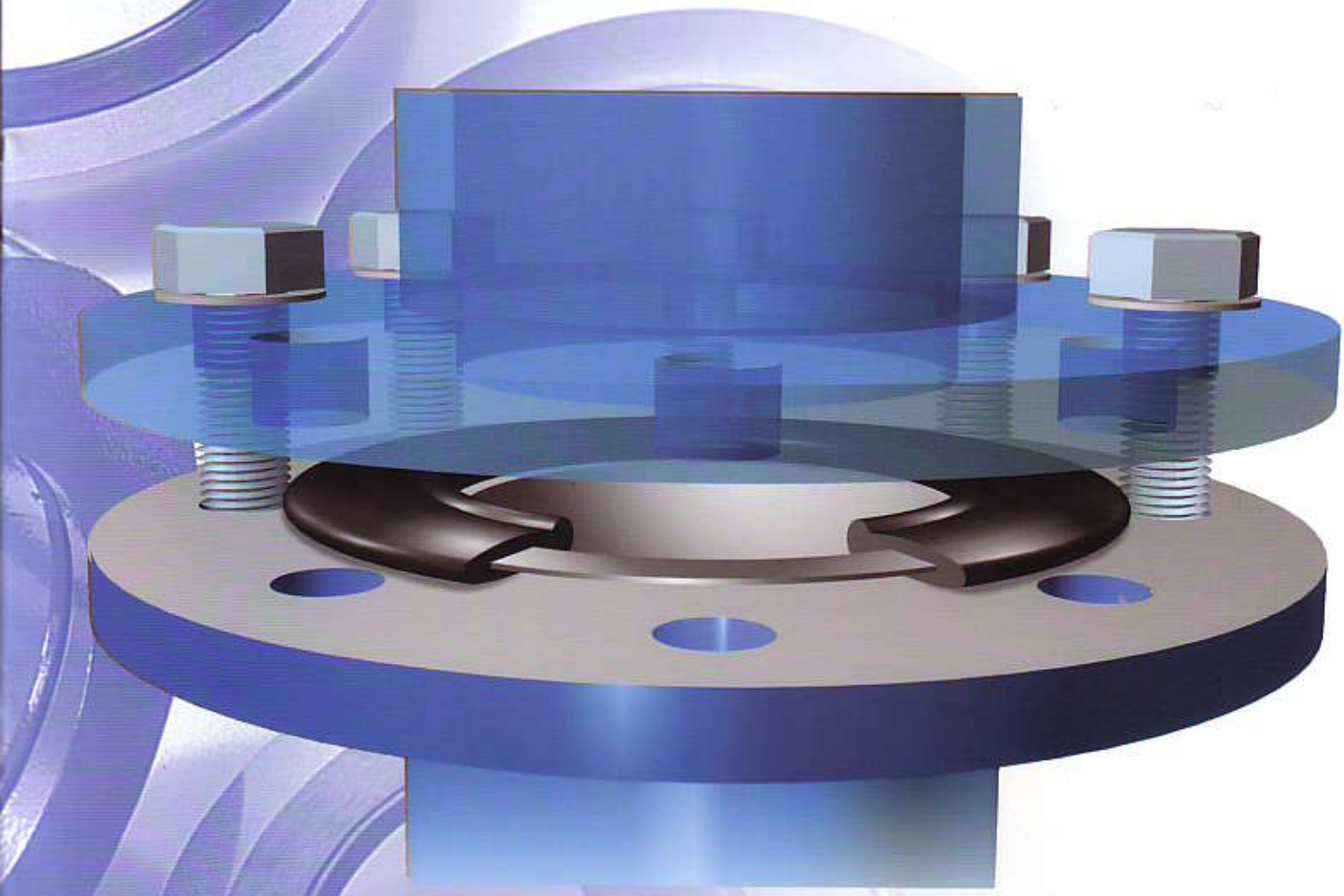
SEALED TIGHT!



G-ST-Flange Gaskets
G-ST-Profile Gaskets
G-ST-Wedge Rings

QM-System
zertifiziert durch:
TÜV CERT
ISO 9001

KROLL & ZILLER

The gasket people

G-ST-Flange Gaskets
G-ST-Profile Gaskets
G-ST-Wedge Rings

Rubber-steel flange gaskets and adjustable wedge rings have been proven in use over many years in all areas of pipeline construction.

Steel mills, power plants, petrochemical, pharmaceutical industries as well as numerous gas and water companies at home and abroad value the advantages of **Kroll & Ziller** sealing products.

Product Range

Page

G-ST
For various applications.

10

G-ST/GUSS
In special dimensions.
For total covering of flange face.

13

G-ST-P/S
For various applications, top choice for joints connecting non-metallic (plastics or GRP) and steel flanges.

14

G-ST-P/K
To suit flange joints connecting pairs of plastic stub ends.

16

G-ST-P/KN
For various applications, top choice for partially coated flanges and heavy duty services.

18

G-ST-P/HTB
For steel flange connections in Fire Safe pipelines.

23

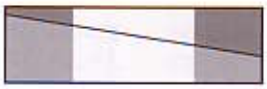
G-ST-P/OE
Flexible design gasket with visible stainless steel insert.

24

G-ST-P/GR
To suit pipework with soft rubber lining and flange faces with soft/hard rubber coating.

25

G-ST-Wedge Ring
Infinitely variable from 0° to 8°.



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G-ST-Profile Gaskets

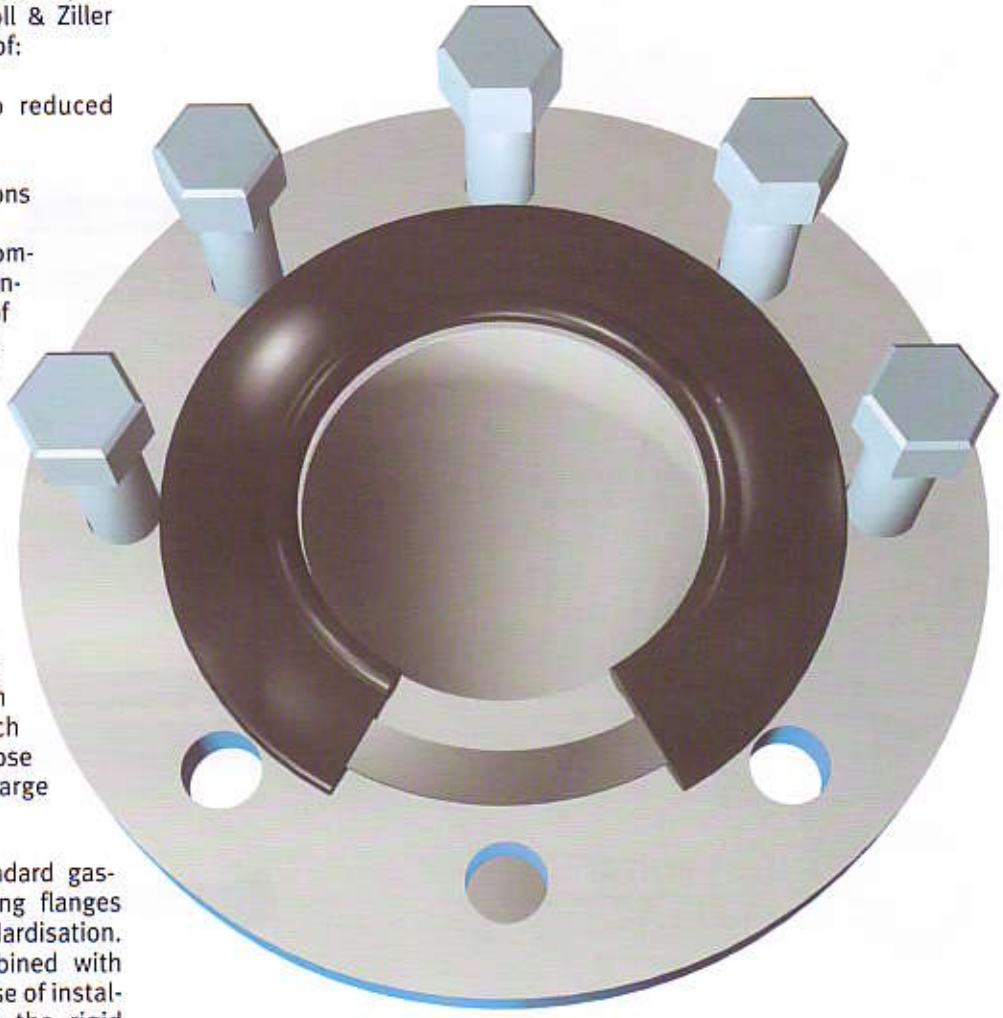
With 40 years of experience in solving individual sealing problems, we can provide you with a range of flange gaskets of exceptional operating reliability. With Kroll & Ziller gaskets you can be sure of:

- high efficiency due to reduced operating costs
- reduced fugitive emissions

Growing international competition makes cost minimisation in all areas of production necessary. Production disruptions and rejections, maintenance and repair costs must be prevented by choosing the best possible construction materials. The risk of possible environmental pollution must be eliminated. The policy of Kroll & Ziller over the last 15 years has been specialisation, research and development in close collaboration with a large number of customers.

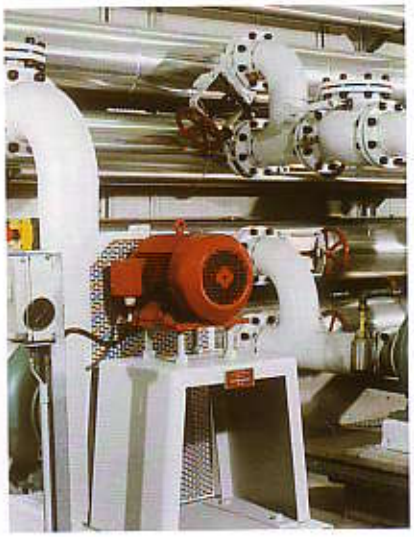
The wide range of standard gaskets available for sealing flanges allows top quality standardisation. High efficiency is combined with superb handling. The ease of installation is attributed to the rigid steel core even with large nominal widths and undesirable stresses. If you have a problem in choosing suitable gaskets, the experienced KROLL & ZILLER sales team is here to assist you.

With steel insert
Flange bolts center the gaskets



G - ST - P / *

S	for Steel pipes
K	for Plastic pipes
KN	for non-load bearing flange joints
OE	visible SS insert
HTB	for Fire safe
GR	for Rubber lined pipes
P	for Profile
ST	with Steel insert
G	for Rubber material

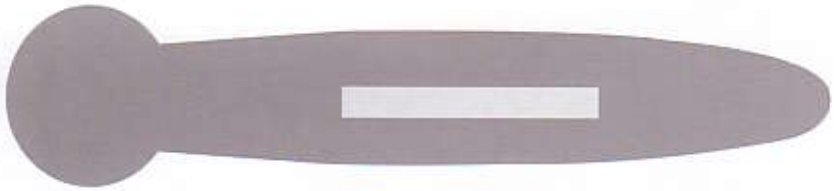


G-ST-Profile Gaskets

Proven in practice

Reliable sealing of flanged joints on pipelines has been made possible by the development of KROLL & ZILLER G-ST gaskets. Vulcanization provides an extremely good adhesion between the steel insert and the rubber sheath. Even when stressed to extremes, separation or blow-outs are not possible. Dimensions in accordance with standards prevents unnecessary flowrate reductions due to part-blocked cross-sections. Additionally, there is optimum handling during installation, since the gasket is self-centering on the bolt circle. The combination of these features makes the G-ST gasket the right choice for you.

The new generation



The G-ST-P profile gasket range illustrates the technological progress of KROLL & ZILLER. The basic concept is very clear in the graphic illustration of the gasket cross-section. The G-ST main body is combined with a round cord ring. This "O-ring" is the most static sealing element. The performance of this O-ring is almost miraculous even without a cost-intensive groove. The G-ST-P profile gasket combines the advantages of its individual parts. High surface pressures transmitted from the main force of the flow are absorbed by the rigid body of the G-ST gasket. The flat steel-ring, corrosion protected by being vulcanized in, absorbs the required test pressure with ease. The O-ring lying parallel to the main force of the flow is ideally compressed against the sealing faces even at low surface pressures. Irregularities and grooves, even slight misalignments are compensated. Also, the gasket shows insensitivity to the minimum torques required during installation which spares the material. A degree of operating reliability - never before reached - is assured. Once in position - it is **sealed tight!** These advantages are especially important for flange joints of thermoplastics (PVC, PE, PP, PVDF). The special KROLL & ZILLER gasket G-ST-P/S has the following advantages:

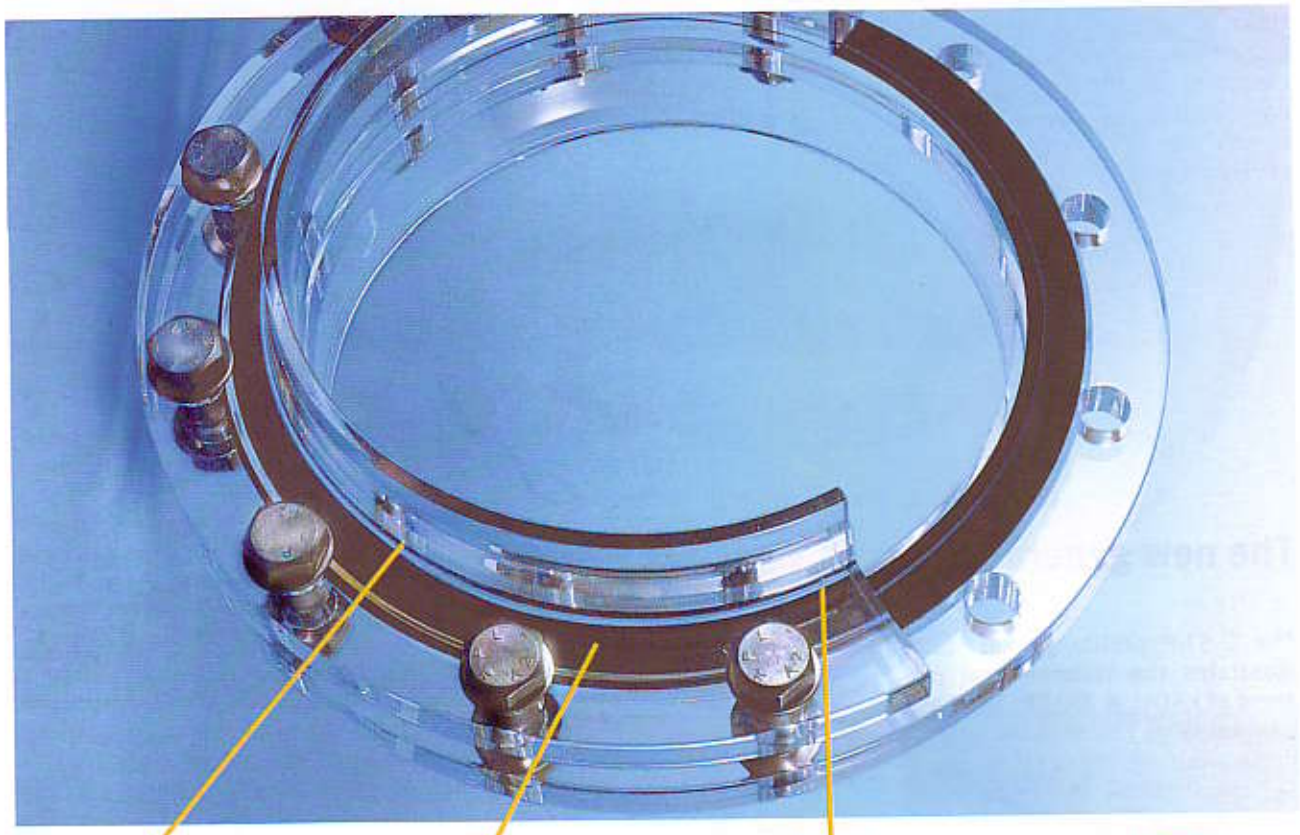
- wide sealing surface area
- rectangular instead of round cross-section near the O-ring

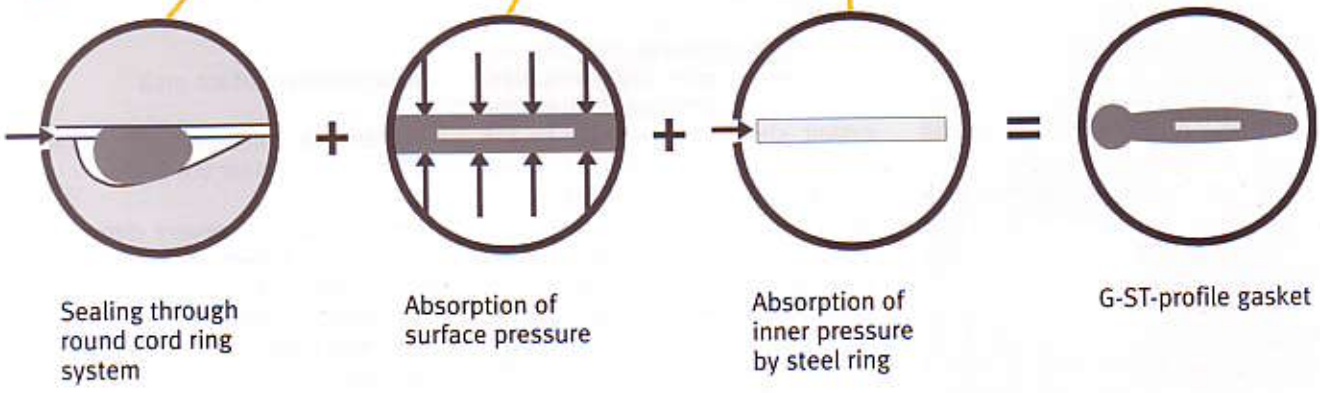
These attributes prevent deformation of the flange adapters. The round cord ring fills the enlarged gap reliably. Minimum required tightening torques protect the joining elements from being overloaded.

G-ST-Profile Gaskets

Benefits linked to G-ST-P gasket applications:

- sealing under minimum bolt tightening
- compensation of surface imperfections
- flange and bolt designs can be more lightweight
- higher durability of plastic flange joints
- angle differences are more easily compensated compared to simple flat gaskets
- expensive machining of an O-ring groove on the flange is unnecessary





Sealing through round cord ring system

Absorption of surface pressure

Absorption of inner pressure by steel ring

G-ST-profile gasket

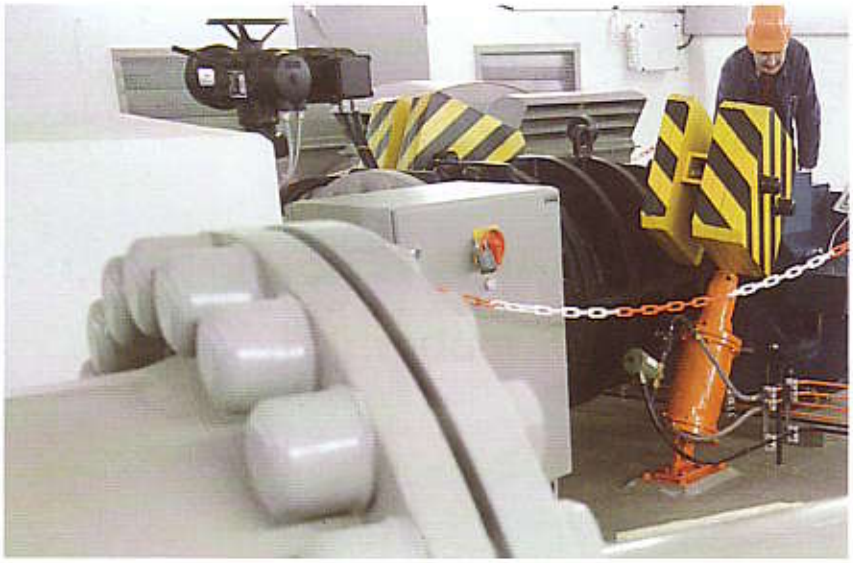
Electrical characteristics of material used for gaskets

The surface resistance R_D and the isolation resistance ρ_D has been determined according to DIN 53482, arrangement of electrodes style "C".

The desruptive voltage U_d has been tested due to DIN IEC 243-2/VDE 0303, part 22 with direct current.

(An electrode with a diameter of 25 mm combined with grounded electrode with a diameter of 75 mm in accordance with DIN VDE 0303, part 21.)

The tests involved items with a thickness of 1 and 5 mm.



material	R_D (Ω) 1mm	R_D (Ω) 5mm	ρ_D (Ω) 1mm	ρ_D (Ω) 5mm	Test voltage (V)	U_d (kV) 1mm	U_d (kV) 5mm
EPDM	0.45×10^3	0.85×10^3	0.5×10^3	0.6×10^3	1	nb	nb
NBR-DUO	3.30×10^3	5.35×10^3	1.5×10^3	3.2×10^3	10	nb	nb
CSM	2.55×10^{12}	1.15×10^{12}	5.5×10^{10}	8.9×10^{10}	100	>15	>15
FPM-S	2.45×10^{11}	2.35×10^{10}	6.2×10^9	7.4×10^9	100	>6	>15

nb = without results

Gasket parameters

due to DIN 28 090-1

due to ASME Code Section VIII Div. 1 Table UA. 49.1

Profile			G-ST, P/S P/K, P/OE	G-ST, P/S P/K, P/OE	P/KN	P/KN	G-ST, P/S, P/K, P/OE		
materials			NBR CR, NR, EPDM, IIR	FPM-S, CSM	NBR, CR, NR EPDM, IIR	FPM-S, CSM	NBR, CR NR, EPDM IIR, CSM FPM-S		
recommended flange face roughness R_a	µm	max.	160	160	160	160	R_a	µ inch	500
surface pressure limits for 20° C	N/mm²	$\delta_{VU/L}$	2	2	2	15	m	-	1.00
		δ_{VO}	15	9	450	450	y	psi	200
surface pressure limits for 150° C	N/mm²	$\delta_{BU/L}$	-	2	-	(15)			
		δ_{BO}	-	5	-	(435)			

G-ST-Profile Gaskets

Extra reliability

The KROLL & ZILLER gasket range was proven in the testing.

Test parameters:

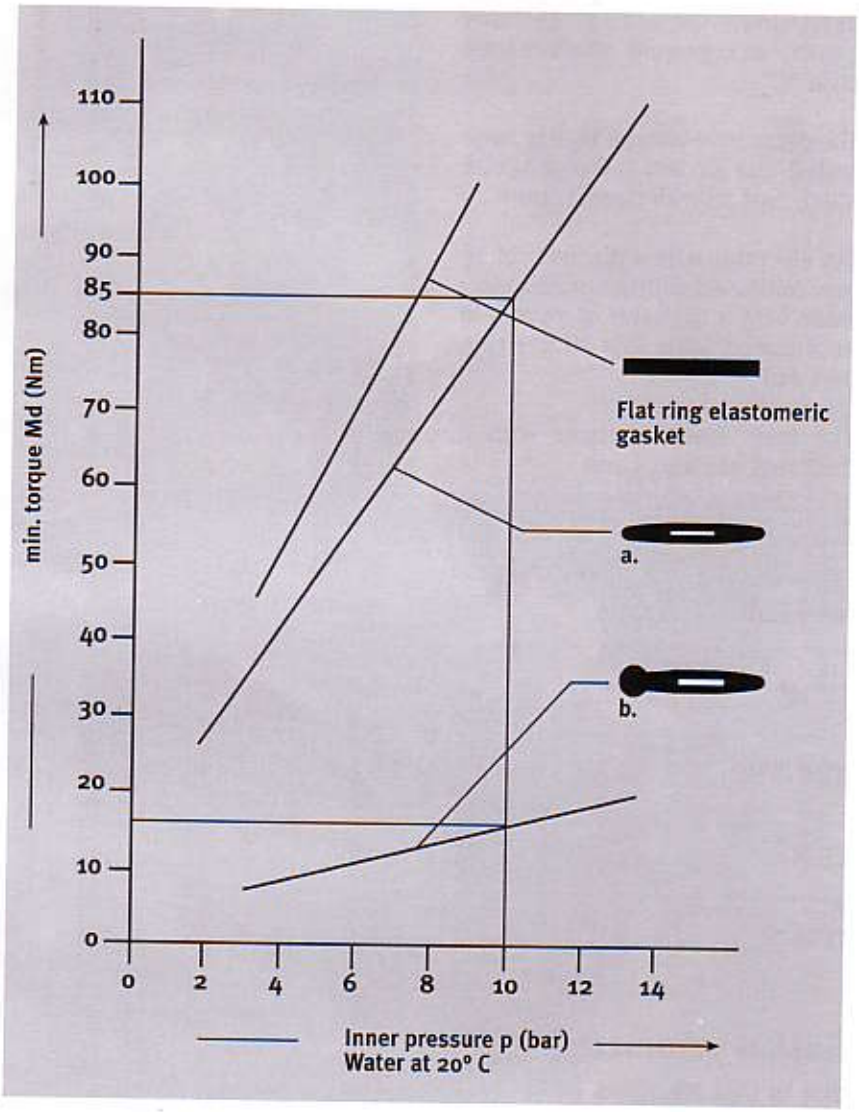
· medium: water

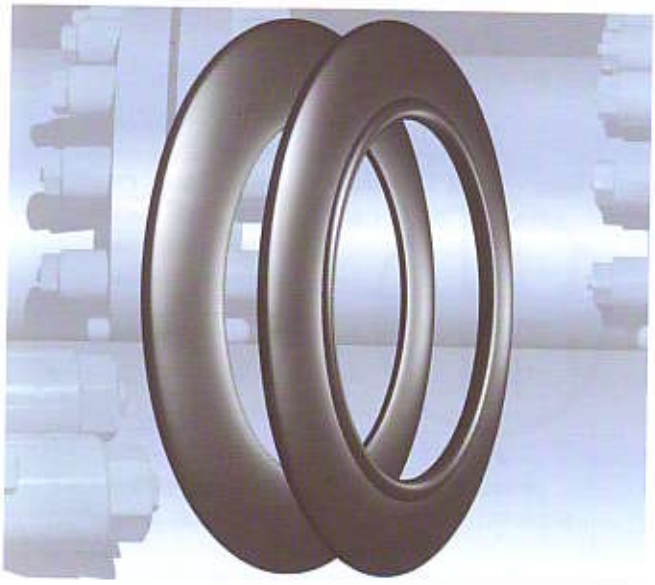
· temperature: 20° C / 68° F

· test pressure: 10 bar / 143 psi

Test samples
20" Gasket
a = G-ST flange gasket
NBR-DUO
b = G-ST-P/S-profile flange gasket
NBR-DUO
c = Flat rubber gasket with textile insert NBR

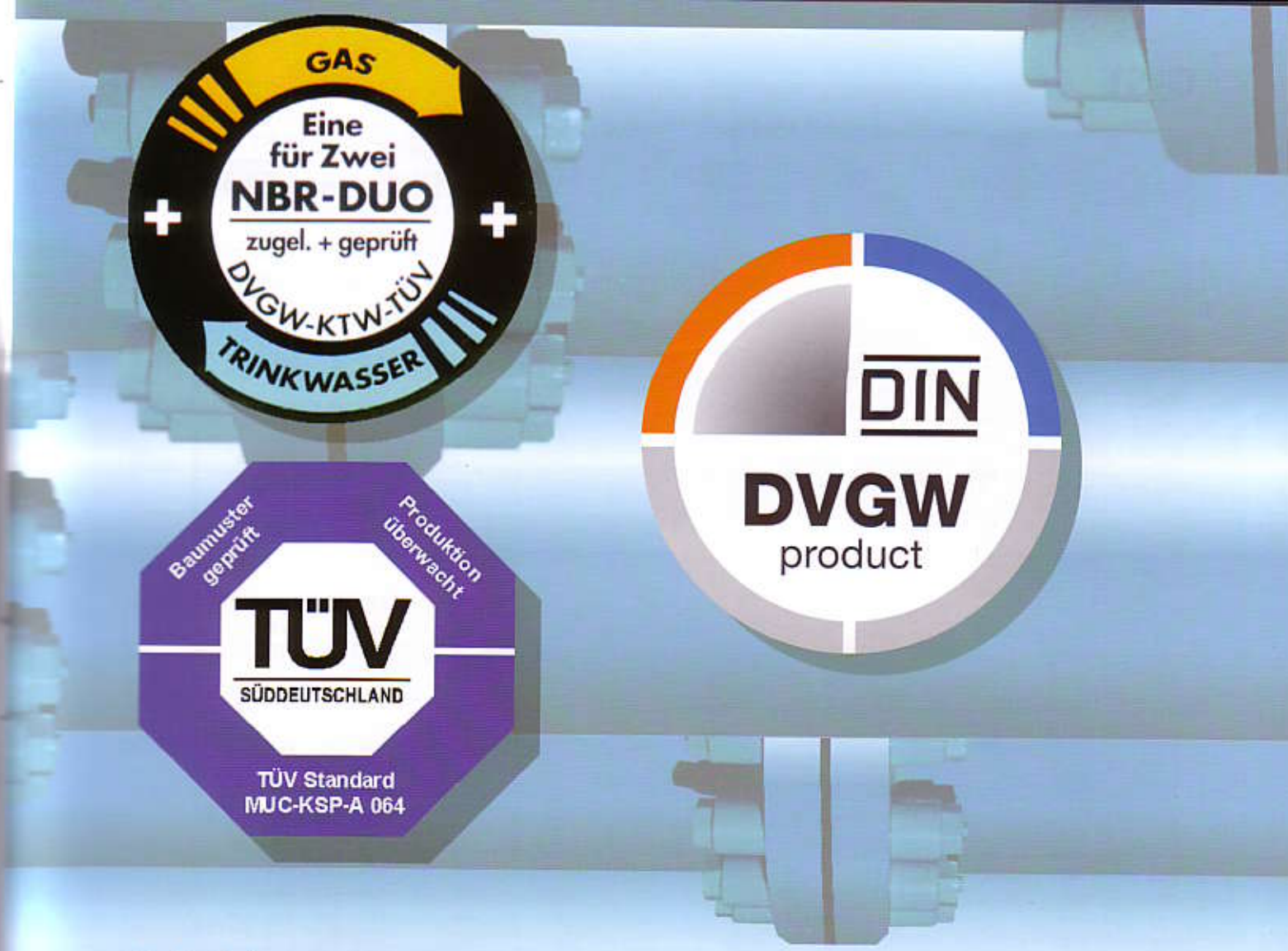
The result of the test series is shown in the graph:
With a pressure of 10 bar / 143 psi only a fraction of the required tightening torque calculated for the G-ST flange gasket is necessary for the G-ST-P/S profile gasket. However, use of the G-ST gasket with the higher value is recommended during installation. The extra reliability offsets many uncertainties in practice.





a. = G-ST-Flange Gaskets

b. = G-ST-Profile Gaskets



Materials:

NR = Natural rubber
Temp. tmax. -30...+ 60° C, Shore -A-hardness 60 ± 5
Temp. Tmax. -22...+ 140° F

NBR-DUO = Acrylonitrile Butadiene rubber
DIN-DVGW test mark, reg.no. NV-5261AP1125

DRINKING WATER
-Test approval by DVGW / TÜV Süddeutschland according to DIN EN 681-1
-KTW recommendation 1.3.13 in the areas D1 and D2, as well as hygienic test in accordance with DVGW code of practice W 270
-FDA, 21 CFR Ch.I (04/2000), § 177.2600

NATURAL GAS
-Test approval by DVGW according to DIN EN 682 substitutes DIN 3535, Part 3 reg.no. NG-5113AP1125
Temp. tmax. -25...+ 70° C, Shore-A-hardness 80 ± 5
Temp. tmax. -13...+ 158° F

HNBR = Hydrogenated Acrylonitrile Butadiene rubber
Temp. tmax. -25...+ 150° C, Shore-A-hardness 75 ± 5
Temp. tmax. -13... + 302° F

CR = Chloroprene rubber
Temp. tmax. -25...+ 95° C, Shore-A-hardness 63 ± 5
Temp. tmax. -13...+ 203° F

CSM = Chlorosulphonated Monomer rubber
Temp. tmax. -20...+ 120° C, Shore-A-hardness 70 ± 5
Temp. tmax. -4...+ 248° F

EPDM* = Ethylene Propylene Diene Monomer rubber
-KTW recommendation 1.3.13 in the areas D1 and D2,
-FDA approved acc.to 21 CFR Ch.I (04/2000), § 177.2600
Temp. tmax. -30...+ 120° C, Shore-A-hardness 70 ± 5
Temp. tmax. -22...+ 248° F

FPM-S* = Fluorinated rubber acid proof
Temp. tmax. -20...+ 200° C, Shore-A-hardness 80 ± 5
Temp. tmax. -4...+ 392° F

IIR = Isobutene Isoprene rubber (Butyle rubber)
Temp. tmax. -25...+ 120° C, Shore-A-hardness 55 ± 5
Temp. tmax. -13...+ 248° F

Steel Insert
Standard: Carbon Steel
Optional: Stainless Steel

* also available as
"HP" (high purity)