

PTFE hose lines





Markert Group: 90 years of experience in process filtration and hose technology

Since the company was founded in 1929, we have been developing industrial hose lines for demanding applications. As a company which has been owner-operated for four generations, we have built a wealth of experience and the name **marsoflex**® has become synonymous for industrial hose systems that meet the most demanding requirements.

Over the years, we have had a decisive influence on our industry. By continuously developing innovative products and providing competent advice to our customers, we have discovered more and more areas of application for PTFE hose lines.

PTFE hose lines for the most demanding process requirements (DIN EN 16643, EN 12115) for the following industries:

- Mechanical and plant engineering
- Chemical industry
- Pharmaceutical industry
- Shipbuilding
- Foodstuffs
- Petrochemical industry

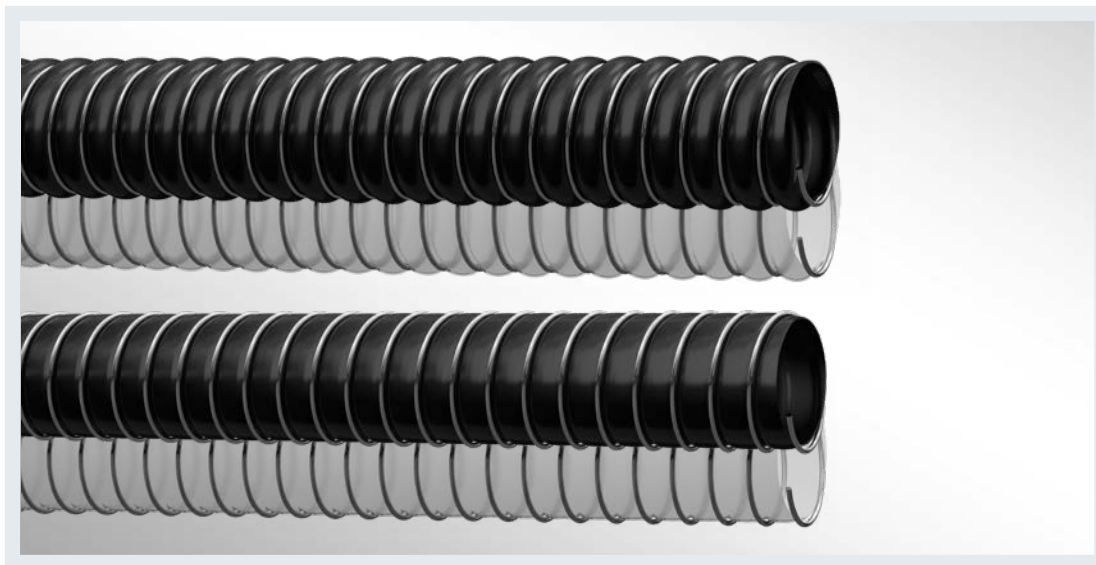
With each of our products, we meet the highest quality standards. To achieve this, we produce **marsoflex**® hose systems in Germany using the state-of-the-art equipment of our plant in Neumünster. This is the only way to ensure that we have full control over all the processes and to guarantee that we can produce large quantities of high-quality products in a very short time.



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PTFE hose tubes



For example, the seamlessly extruded PTFE which we use consists of pure Teflon® T-62 by Chemours (formerly DuPont) and is resistant to virtually all chemical media. Our PTFE is free of dual use substances, food supplements and flavourings. The special non-stick properties of PTFE facilitate easy cleaning and ensure that virtually any medium can be conveyed. The smooth surface of the tube prevents the formation of dirt accumulations or bacteria. Depending on hose design and operating conditions, operating temperature ranges between -60 °C and +260 °C are possible.

The **marsoflex**® PTFE liners are available in white (virginal and insulating) and black (antistatic/ electrically conductive in accordance with ISO 8031 [electrical resistance $\leq 10^6 \Omega$]). The additional use of a stainless steel spiral (vacuum spiral) gives the corrugated tube hoses type C, CA a high resistance to vacuums and kinks. With the smooth hoses type GA, GC, this spiral is integrated by default for manufacturing reasons.

Corrugated tube hose type C, CA (available with/ without stainless steel spiral)

- Type C, white (virginal)
- Type CA, black (anti-static)

The corrugated tube hose type C, CA is a universal suction and pressure hose. It is used in areas which require high flexibility.

Smooth hose type GA, GC
(with fixed stainless steel spiral)

- Type GA, black (anti-static)
- Type GC, white (virginal)

The smooth hose type GA, GC is extremely flexible but still smooth. The production-related stainless steel spiral gives the smooth hose a high resistance against vacuums and kinks.

Smooth hose type G (not shown)

- Type G (virginal)

The smooth hose type G is used where no unevenness in the hose tube is desired and/or required.



Pressure carrier



All **marsoflex**® braiding types meet the required operating conditions regarding pressure or temperature as well as chemical and operational requirements.

B1 stainless steel braiding

The **marsoflex**® stainless steel braiding protects the inner PTFE liner and at the same time ensures a high pressure resistance of the hose. It also enhances the bending strength. We exclusively use high-grade stainless steel such as 1.4301. The braiding is abrasion-resistant.

B3 modified plastic braiding

The **marsoflex**® B3 polypropylene braiding is unique on the market and stands out due to its particularly high temperature resistance and extreme tearing strength. It can easily withstand operating pressures up to 32 bar (depending on nominal diameter and temperature) and is therefore significantly more resilient than other

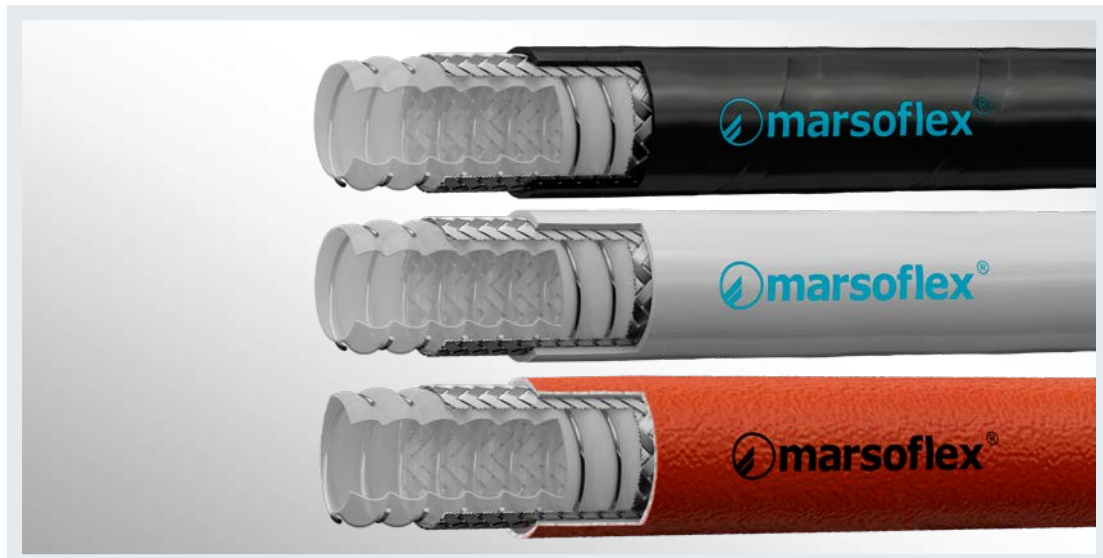
commercially available plastic braidings. It is resistant to temperatures up to 230 °C. In addition, the modified plastic braiding is TRbF-131/2-compliant. Thanks to the especially included metal filaments, it is electrically conductive and can also be used in explosive atmospheres. The B3 braiding has the same chemical resistance as polyethersulfone (PES).

B6 polypropylene braiding

The **marsoflex**® B6 polypropylene braiding which is made of specially developed monofilaments facilitates the use of high operating pressures and ensures easy handling due to its low dead weight. It can be used for any application in which metal materials are excluded due to lack of resistance.



Hose covers



In addition to the standard versions, we offer further hose cover options.

Stainless steel braiding with B1GUM rubberised cover

Many industrial applications require increased abrasion protection as well as protection against injuries caused by the handling of hose lines. Our rubberised stainless steel braiding is the ideal solution for this area of application. In contrast to traditional systems on the market, our CR material is TRbF-131/2-compliant, i.e. self-extinguishing, anti-static and easy to clean.

Stainless steel braiding with B1SIL silicone cover

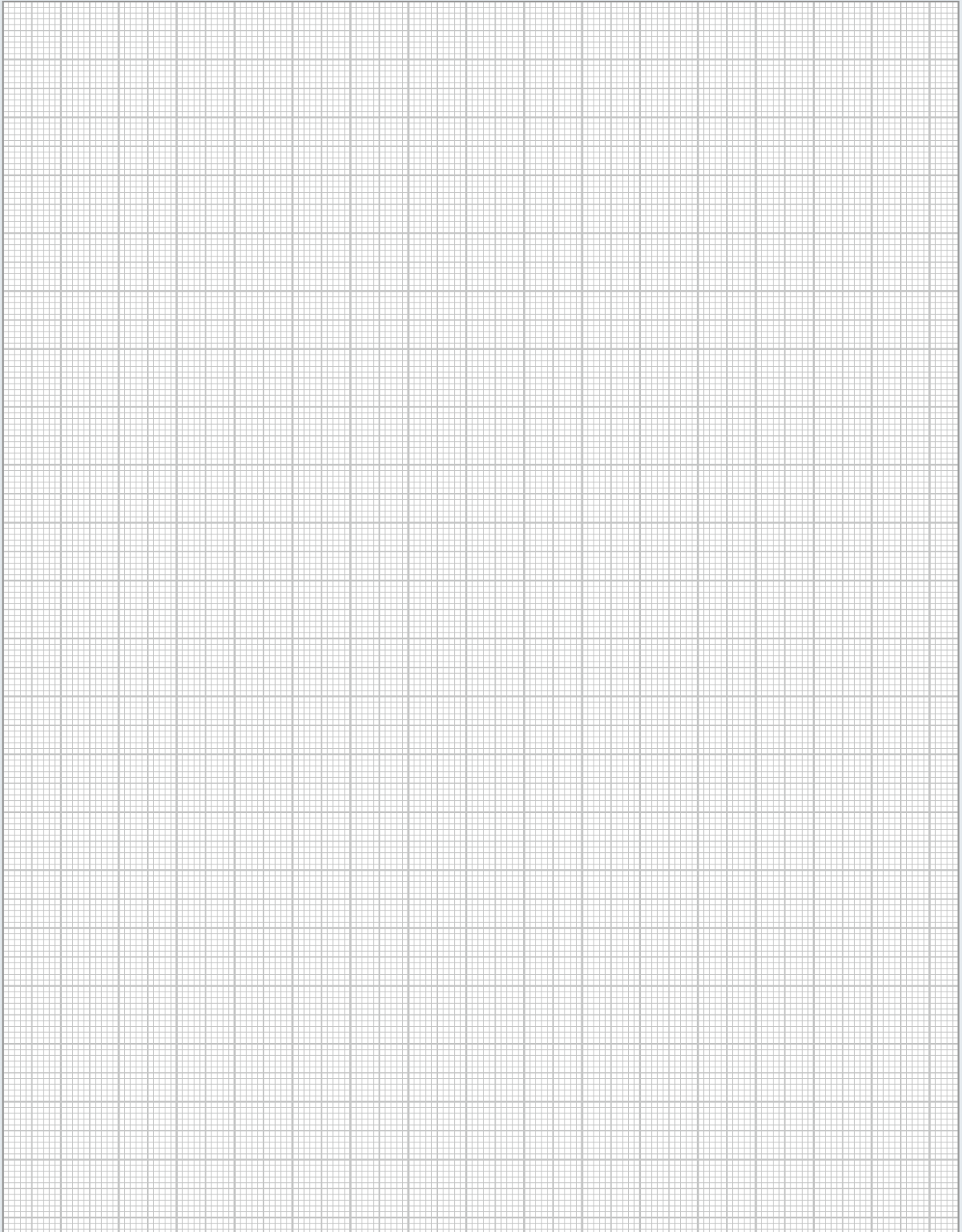
In particular for the pharmaceutical industry, a smooth, white silicone cover was developed which makes the cleaning of the hose significantly easier. In addition, it provides protection against mechanical stress. The surface temperature also

remains relatively low to protect the user. This hose cover can be used up to 180 °C.

Special pyro heat protection PY

Especially developed for the use at high temperatures, this protective cover can be used permanently at 260 °C and for a short time at over 800 °C (flame exposure). It protects the inner hose design against high radiant heat and thereby ensures a long service life under extreme conditions. The material is resistant to industrial chemicals and hydraulic fluids. In addition, the heat protection reduces the temperature at the hose surface in case of hot media and thus ensures the safe handling of the hose line.







Type G, GA, GC PTFE smooth hose

Order number	Nominal diameter*	Max. operating pressure in bar (20 °C)			
	ID [mm]	B1 braiding [bar (20 °C)]	Bending radius [mm]	B1Sil cover [bar (20 °C)]	Bending radius [mm]
G05	5	260	65	*	*
G06	6	220	80	220	75
G08	8	205	105	205	100
G010	10	180	135	180	130
G012	12	160	150	160	150
GA013-GC013	12/12	50	40	50	60
GA016-GC016/G016	16/16	50/110	45/180	50/110	65/175
GA020-GC020/G020	20/20	45/100	50/205	50/100	80/200
GA025-GC025/G025	25/25	40/80	70/305	40/80	120/305
GA032-GC032	32/32	45	85	40	155
GA040-GC040	40/40	40	100	40	200
GA050-GC050	50/50	25	140	25	250

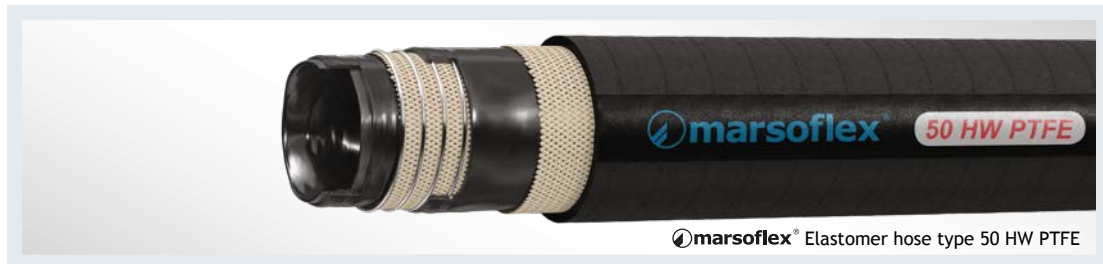
Other dimensions available on request

Your notes

Your notes	
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PTFE elastomer hose

with conductive PTFE tube



Product name	marsoflex® Elastomer hose type 50 HW PTFE in accordance with EN 12115
Description	The marsoflex® Universal chemical hose type 50HW PTFE is a universally usable elastomer hose with a seamless, conductive inner layer of black PTFE. It can be used in the chemical, pharmaceutical and food industry.
Properties	<ul style="list-style-type: none"> • Non-stick properties of PTFE • FDA-compliant • Usable in all Ex zones
Hose tube	PTFE, black, smooth
Reinforcement	Synthetic fabric reinforcements, galvanized steel wire spirals
Hose cover	EPDM, black, smooth, fabric pattern, resistant to abrasion, ageing and ozone

Electrical properties	Tube: $R < 10^6 \Omega$, cover: $R < 10^9 \Omega$, passage: $R < 10^9 \Omega$
Temperature range	For operating temperatures from $-40 \text{ }^\circ\text{C}$ to $+150 \text{ }^\circ\text{C}$ (saturated steam) depending on medium and concentration
Hose cleaning	The smooth tube prevents the formation of dirt accumulations and can be easily cleaned
Hose resistance	Suitable for virtually any media, e.g. acids, alkaline solutions, oils, greases, alcohols and organic compounds. For further information, please refer to the marsoflex® resistance list




Order number	ID [mm]	OD [mm]	Max. operating pressure [bar (20 °C)]	Max. underpressure [bar (20 °C)]	Bursting pressure [bar (20 °C)]	Bending radius [mm]
50HW013	13	25	16	-0.9	64	90
50HW019	19	31	16	-0.9	64	130
50HW025	25	37	16	-0.9	64	170
50HW032	32	44	16	-0.9	64	215
50HW038	38	51	16	-0.9	64	255
50HW050	50	66	16	-0.9	64	330
50HW065	63	79	16	-0.9	64	430
50HW075	75	91	16	-0.9	64	510

The above stated values refer to the ambient temperature (20 °C); we recommend reducing the operating pressure by 20 % for each temperature increase of 100 °C.

PTFE elastomer hose

with a highly conductive PTFE tube



Product name	 marsoflex ® PTFE hose system type 50 HW BioPharm	Reinforcement	High-strength textile braiding, kink-resistant and dimensionally stable steel wire spirals, litz wire
Description	The  marsoflex ® pharmaceutical and chemical hose type 50 HW BioPharm is a universally usable elastomer hose with a seamless inner layer made of white PTFE. It can be used as a suction and pressure hose for up to 16 bar.	Hose cover	EPDM, white, fabric pattern
Properties	<ul style="list-style-type: none"> Compliant with DIN EN 12115:2011 Tube complies with the FDA guidelines FDA 21 CFR 177.1520 Excellent bending properties Non-fading hose cover Hose cover resistant against oil, ageing, weather and ozone influences Excellent chemical resistance 	Electrical properties	Type M
Hose tube	PTFE, white, smooth, FDA-compliant	Temperature range	-40 °C to +150 °C
		Hose cleaning	CIP process and saturated steam up to +150 °C (short-term)
		Hose resistance	Suitable for virtually any media and acids, alkaline solutions, oils, greases, alcohols and organic compounds. For further information, please refer to the  marsoflex ® resistance list online.

Order number	ID [mm]	OD [mm]	Operating pressure [bar]	Max. underpressure [bar (20 °C)]	Bursting pressure [bar]	Bend radius [mm]
50HW013PHARMA	13	25	16	-0.9	64	90
50HW019PHARMA	19	31	16	-0.9	64	130
50HW025PHARMA	25	37	16	-0.9	64	170
50HW032PHARMA	32	44	16	-0.9	64	215
50HW038PHARMA	38	51	16	-0.9	64	255
50HW050PHARMA	50	66	16	-0.9	64	330
50HW065PHARMA	63.5	79.5	16	-0.9	64	430
50HW075PHARMA	75	91	16	-0.9	64	510
50HW100PHARMA	100	116	12	-0.9	48	675

The above stated values refer to the ambient temperature (20 °C); we recommend reducing the operating pressure by 20 % for each temperature increase of 100 °C.

Other dimensions available on request

Protection systems

To further increase the service life of the durable **marsoflex**® PTFE hose systems, we offer the following accessories.

AGRAFF protection conduit

On request, we can equip the entire hose line with an Agraff high-strength protection conduit made of stainless steel. It provides reliable protection against severe mechanical impacts.

RKP rubber kink protection

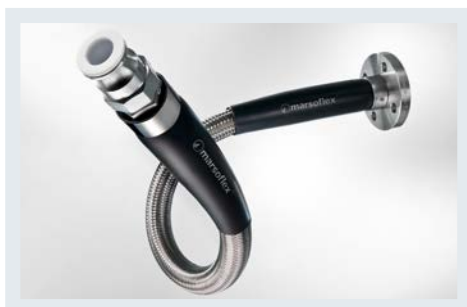
The **marsoflex**® rubber kink protection which has been newly developed by our engineers considerably increases the service life of hose lines. It reinforces the areas behind the ferrule which are exposed to particularly high stress and reduces the risk of kinking in this way. Thanks to its electrical conductivity, the kink protection can also be used in explosive atmospheres.

FRAS abrasion protection spiral

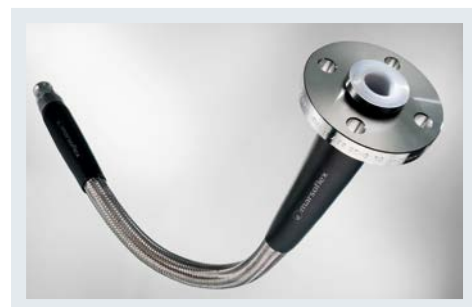
For high mechanical stress, we recommend our electrically conductive **marsoflex**® protection spirals. They are available in stainless steel or synthetic variants. The stainless steel protection spiral resists temperatures from -60 °C to +500 °C, while the synthetic protection spiral is suitable for use from -60 °C to +90 °C.



AGRAFF protection conduit



PTFE hose lines with rubber kink protection and lined Camlock quick coupling.



PTFE hose lines with rubber kink protection and flange with crimp.



Connections

marsoflex® PTFE hoses can be equipped with any connection. The couplings and fittings are available in standard nominal diameters and materials and are compliant with industry standards. Examples: aseptic connections, flange connections, connections with male thread or union nut, milk pipe screw connections, quick coupling systems. Special connections are available on request.

All fittings and couplings can be additionally lined or coated with chemically resistant plastics such as PTFE or E-CTFE (Halar®) to protect them against aggressive media.

For further information, please refer to our couplings and connections catalogue.



Safety clamps

with aseptic clamp connection in accordance with EN 14420



Order number	Head size [mm]	Material ¹
TCS13	34.0	SS
TCS19	34.0	SS
TCS25	50.5	SS
TCS32	50.5	SS
TCS38	50.5	SS
TCS50	64.0	SS
TCS65	91.0	SS
TCS75	106.0	SS
TCS100	119.0	SS

Safety clamps

with aseptic collar flange in accordance with EN 14420



Order number	Flange size [mm]	Material ¹
ASFB15A	59.0	SS
ASFB20A	64.0	SS
ASFB25A	70.0	SS
ASFB32A	76.0	SS
ASFB38A	82.0	SS
ASFB50A	94.0	SS
ASFB65A	113.0	SS
ASFB75A	133.0	SS
ASFB100A	159.0	SS

Safety clamps with
aseptic pipe fitting and
union nut in accordance with EN 14420



Order number	Thread ²	Material ¹
ASM15A	Rd. 34 x 1/8"	SS
ASM20A	Rd. 44 x 1/6"	SS
ASM25A	Rd. 52 x 1/6"	SS
ASM32A	Rd. 58 x 1/6"	SS
ASM38A	Rd. 65 x 1/6"	SS
ASM50A	Rd. 78 x 1/6"	SS
ASM65A	Rd. 95 x 1/6"	SS
ASM75A	Rd. 110 x 1/4"	SS
ASM100A	Rd. 130 x 1/4"	SS

Safety clamps
with aseptic pipe fitting and
external thread in accordance with EN 14420



Order number	Thread ²	Material ¹
ASV15A	Rd. 34 x 1/8"	SS
ASV20A	Rd. 44 x 1/6"	SS
ASV25A	Rd. 52 x 1/6"	SS
ASV32A	Rd. 58 x 1/6"	SS
ASV38A	Rd. 65 x 1/6"	SS
ASV50A	Rd. 78 x 1/6"	SS
ASV65A	Rd. 95 x 1/6"	SS
ASV75A	Rd. 110 x 1/4"	SS
ASV100A	Rd. 130 x 1/4"	SS

Safety clamps
with aseptic groove flange in accordance with EN 14420

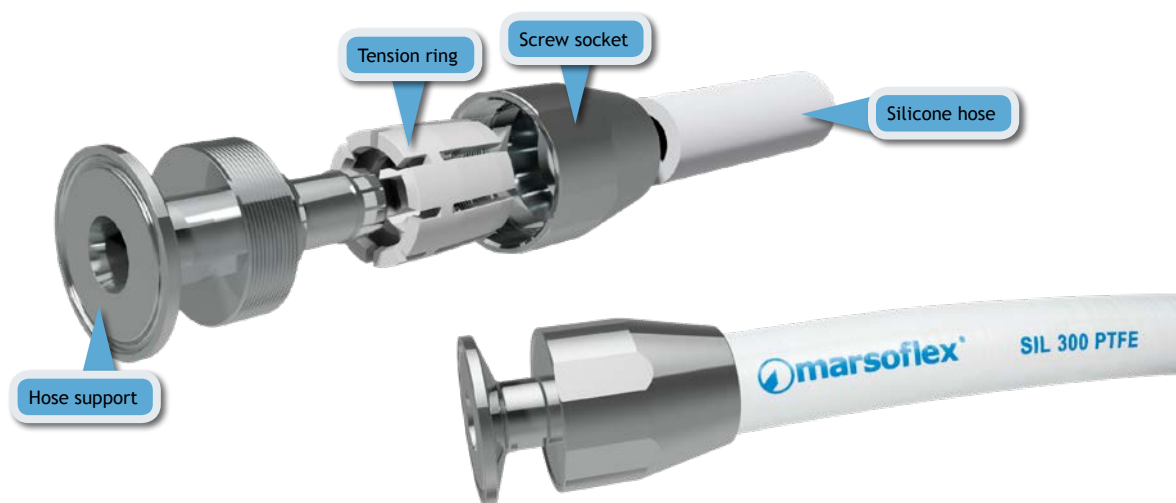


Order number	Flange size [mm]	Material ¹
ASFN15A	59.0	SS
ASFN20A	64.0	SS
ASFN25A	70.0	SS
ASFN32A	76.0	SS
ASFN38A	82.0	SS
ASFN50A	94.0	SS
ASFN65A	113.0	SS
ASFN75A	133.0	SS
ASFN100A	159.0	SS

ReLock[®] - reusable screw fitting

Three-part reusable screw fitting

for our **marsoflex**[®] hoses type SIL200, SIL300, SIL300PTFE, SIL350PTFE



Surface quality DIN 11864-1 (Ra in µm)

Hygiene class	Internal surface	External surface
H3	< 0.8	< 1.0
H4	< 0.4	< 1.0

Our three-part fitting is a high-quality, reusable screw fitting for our **marsoflex**[®] hoses type SIL200, SIL300, SIL300PTFE, SIL350PTFE, SIL-C, SIL-R and SIL-W. For these and further hose types, please refer to our Pharmaceuticals & Food catalogue. It was especially developed to meet the high demands of the pharmaceutical and biochemical industry.

This fitting is ideal for expanding our product portfolio in the area of reusable fittings and is particularly suited for large nominal diameters where a screw connection using our two-part fitting is no longer possible. The screw fitting is available in the dimensions DN 13, DN 20 to DN 50 in the standard version. All standard connections are available as welded or turned part.

- Particularly easy to clean
- Optimised for clean-room production
- Suitable for customer assembly
- No special tools needed

The medium-affected hose support is made from high-quality and highly-resistant stainless-steel 1.4404 or 1.4435. The tension ring is made from PVDF which is suitable for autoclaving. The screw socket is available in stainless-steel or PVDF. We recommend our silicone hoses for the three-part reusable screw fitting.

PTFE high performance seal



Optional PTFE end seal for **marsoflex**® PTFE hose lines for a significantly longer service life

The advantage of the thick-walled PTFE end seal is that the sealing capacity is ensured for a considerably longer period during operation. This means that further seals are no longer required. Especially when the hose is frequently connected and disconnected, the integrated PTFE seal provides particularly high protection against damage in the sealing area caused by possible falls or impacts.

The **marsoflex**® PTFE end seal is available for all standard nominal diameters. Special dimensions are available on request.

The **marsoflex**® PTFE end seal is available in white virginal PTFE and in black, anti-static PTFE. Both variants are FDA-compliant.

Customer example:

To handle aggressive media easily and flexibly, you need lightweight, durable hose lines with the lowest possible bending radius. A solid inliner is ideal for keeping interior soiling to a minimum.

The solution:

The **marsoflex**® PTFE hose line with diagonally corrugated inliner has a PTFE tube which is passed through the fitting and crimped at the coupling surface. For one customer, 90 % of defective PTFE lines were traced back to damage to the crimp. With our fixed PTFE end connection, this source of error could be drastically reduced without needing to forego the benefits of the flexible crimped PTFE line. The significantly increased lifespan of the **marsoflex**® PTFE lines with PTFE end connection led to immense cost savings.



Linings and coatings

In order to protect the connections of the **marsoflex**® hose lines against aggressive media, they are coated with plastics such as E-CTFE (Halar®), lined with PTFE (alternatively PFA) or the PTFE hose is inserted and they are then crimped.

PTFE is offered as white virginal and electrically insulating version. For applications requiring electrically conductive properties, antistatic PTFE (black) is used. Both PTFE variants are FDA-compliant.

Coating

The medium-contacting areas of the fitting or coupling are coated with E-CTFE or a comparable plastic. In this way, effective corrosion protection against aggressive media is achieved.

Lining

A thick-walled PTFE mould is integrated into all areas of the fitting that come into contact with the medium. This mould protects the fitting or coupling from the

chemical corrosion by acids and alkaline solutions. Due to the excellent chemical resistance, PTFE is a safe and economic alternative to expensive special alloys such as Hastelloy.

Crimp

The PTFE hose is made malleable by heating it up. In this condition, it is pulled through the fitting or coupling and crimped according to the connection end, i.e. adjusted to the connection. The advantage of crimping is that no dead space forms in the area between fitting and hose where medium residues could gather. Consequently, the highest possible level of cleanliness is guaranteed for sensitive applications for example in the pharmaceutical and food industry. The use of a fully automated system for crimping PTFE hoses in addition guarantees large quantities in consistently high quality.

Do you require individual solutions with regard to the lining and coating? Please contact us.

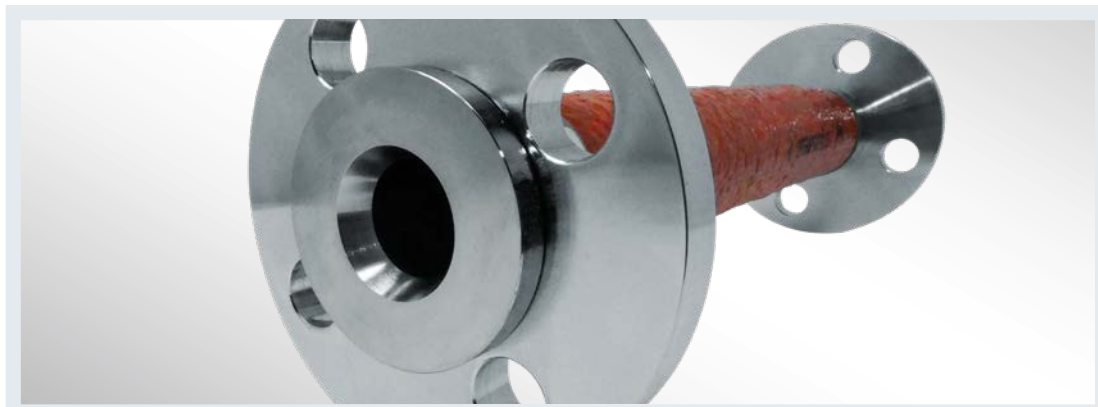
Coupling lined with PTFE



Fittings lined with PTFE



Special hose lines



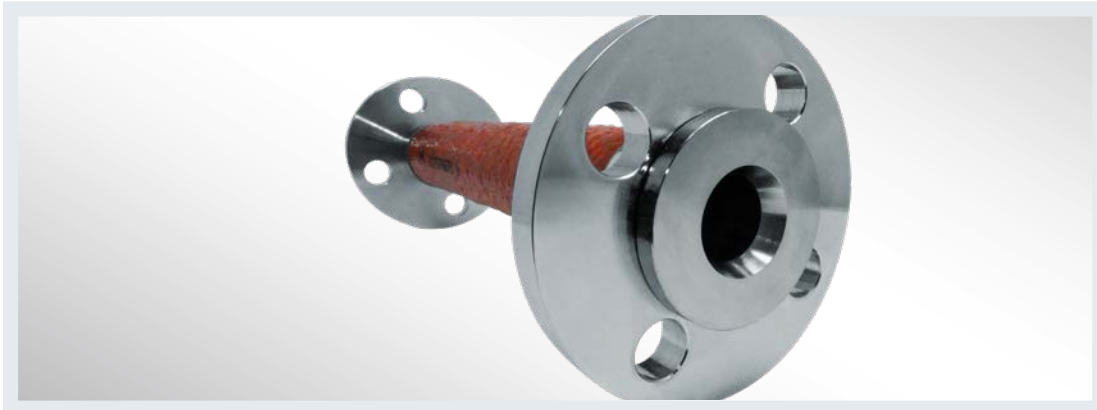
Product name	☉marsoflex® Fuel hose type MDO
Description	Our ☉marsoflex® MDO fuel hose is a highly flexible, helically corrugated PTFE hose with stainless steel braiding and flame protection. The fittings are attached using an inseparable safe crimping connection. Type MDO meets all IACS requirements.
Application	Suitable for heavy oil, gasoil, marine diesel oil, lubricant, hydraulic fluid as well as fresh water, sea water and oil-containing water.
Properties	<ul style="list-style-type: none"> • Temperature range: -50 °C to +150 °C (180 °C). • Favourable mechanical properties, resistant to vibrations. • Non-flammable. • No ageing, very high UV resistance. • Low frictional resistance. • Very high flame resistance in accordance with ISO 15540



Couplings	Special design made of galvanized steel to be equipped with commonly used connections (fixed-type flange, loose-type flange, internal thread, external thread and others)
Certifications	The ☉marsoflex® MDO fuel hose is type tested by: ABS, LR, NK, BV and DNV-GL. Other certifications available on request. In addition, this hose type is MED-approved (Marine Equipment Directive) MEDD00001AD and MEDB00003AG.


Article number, natural, white	Article number, natural, white	ID [mm]	OD [mm]	Operating pressure [bar (20 °C)]	Bursting pressure [bar (20 °C)]	Bending radius [mm]
C016MDO	CA016MDO	16.0	26.0	16	64	51
C020MDO	CA020MDO	20.0	29.0	16	64	64
C025MDO	CA025MDO	25.0	42.0	30	120*	89
C032MDO	CA032MDO	32.0	50.0	16	64	150
C038MDO	CA038MDO	38.0	53.0	16	64	170
C050MDO	CA050MDO	50.0	70.0	16	64	210

Other dimensions available on request. *Special approval

Special hose lines



Product name	 marsoflex ® Fuel hose type HFH
Description	Our  marsoflex ® HFH fuel hose is a smooth PTFE hose with two stainless steel braidings and dual flame protection. The fittings are attached using an inseparable safe crimping connection. Type HFH meets all IACS requirements.
Application	Suitable for heavy oil, gasoil, marine diesel oil, lubricant, hydraulic fluid as well as fresh water, sea water and oil-containing water.
Properties	<ul style="list-style-type: none"> • Temperature range: -50 °C to +150 °C (180 °C). • Favourable mechanical properties, resistant to vibrations. • Non-flammable. • No ageing, very high UV resistance. • Low frictional resistance. • Very high flame resistance in accordance with ISO 15540

Couplings	Special design made of galvanized steel to be equipped with standard connections (fixed-type flange, loose-type flange, internal thread, external thread and others)
Certifications	The  marsoflex ® HFH fuel hose is type tested by: RINA, RS, ABS, LR, NK, BV and DNV-GL. Other certifications available on request. In addition, this hose type is MED-approved (Marine Equipment Directive) MEDD00001AD and MEDB00003AG

Article number	Nominal diameter	ID [mm]	OD [mm]	dynamic load Operating pressure [bar (20 °C)]	static load Operating pressure [bar (20 °C)]	Bursting pressure [bar (20 °C)]	Bending radius [mm]
G16HFH	5/8"	16.0	33.0	50	80	600	260
G20HFH	3/4"	20.0	38.0	50	80	500	300
G25HFH	1"	25.0	43.0	50	80	440	350

Other dimensions available on request

Special hose lines



On request, our engineers develop special solutions tailored to your individual requirements.

One example is the **marsoflex®** helix heating hose which we developed for the food industry and which is now part of our standard portfolio. This PTFE hose which is helically wrapped around the hose which conducts the medium facilitates the heating or cooling of the medium using steam, thermal oil, hot water or coolant.

Another variant is the electrical trace heating. A resistance wire is wrapped around the hose which conducts the medium and voltage is applied. The resulting heat is transferred to the medium. This variant is used when liquid, viscous or molten media are to be transported without temperature loss.

All **marsoflex®** heating and cooling hoses consist of highly flexible, corrugated PTFE with stainless steel braiding as a pressure carrier.

Properties:

- Very favourable bending flexibility
- High heating power
- Small outer diameter
- Temperature range: -50 °C to +180 °C
- Helix heating hose for saturated steam of up to 16 bar, not resistant to vacuums
- Medium-conducting hose for saturated steam of up to 16 bar, resistant to vacuums of up to 0.6 bar
- Favourable mechanical properties, resistant to vibrations
- Thermally insulated stainless steel braiding on the outside
- Resistant to ageing

Benefits:

- Long service life thanks to high-quality materials and robust design
- Flexibly adaptable to the relevant application
- Consistent quality and configuration of replacement parts



Technical information

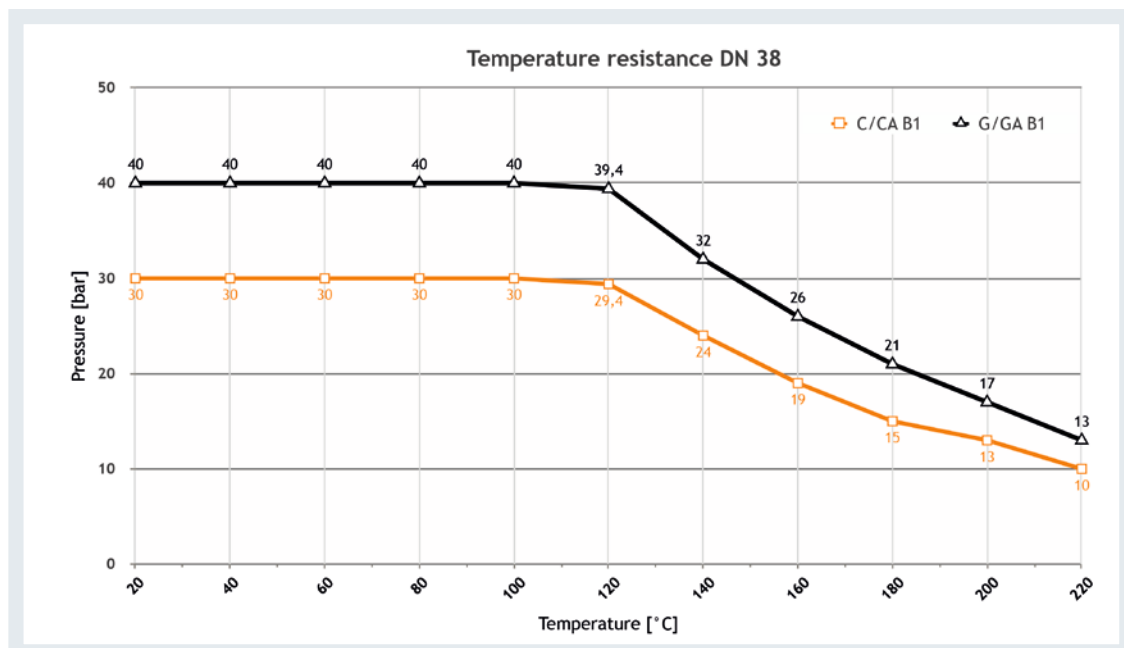
PTFE hoses are manufactured individually for the relevant application. To exactly determine the hose design, the operating conditions of the hose application are recorded in a first step.

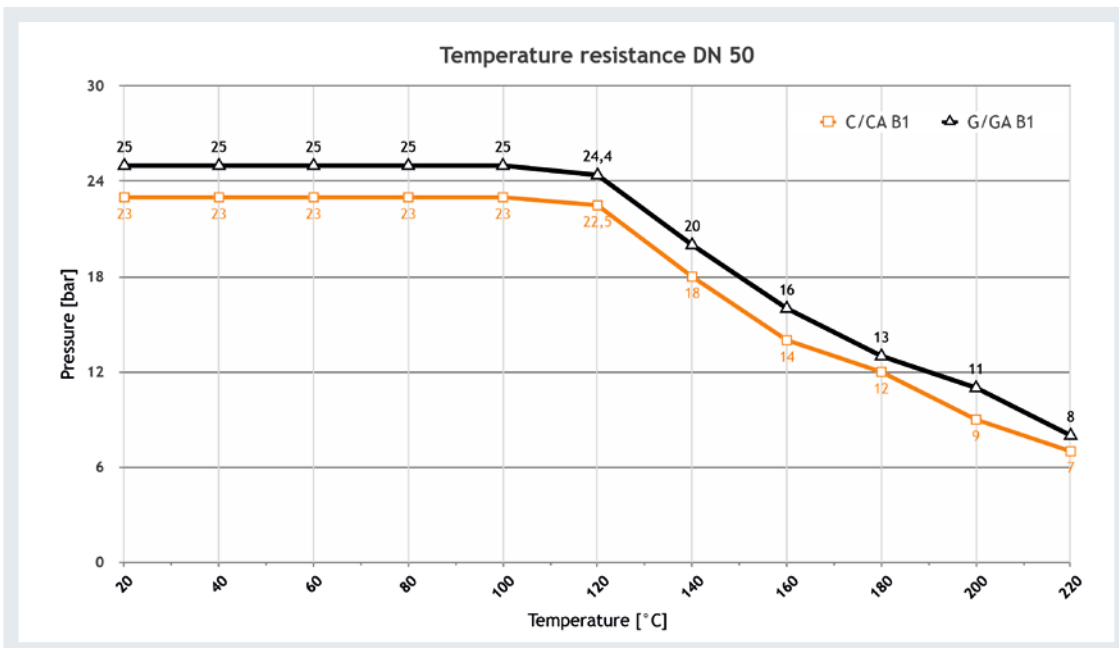
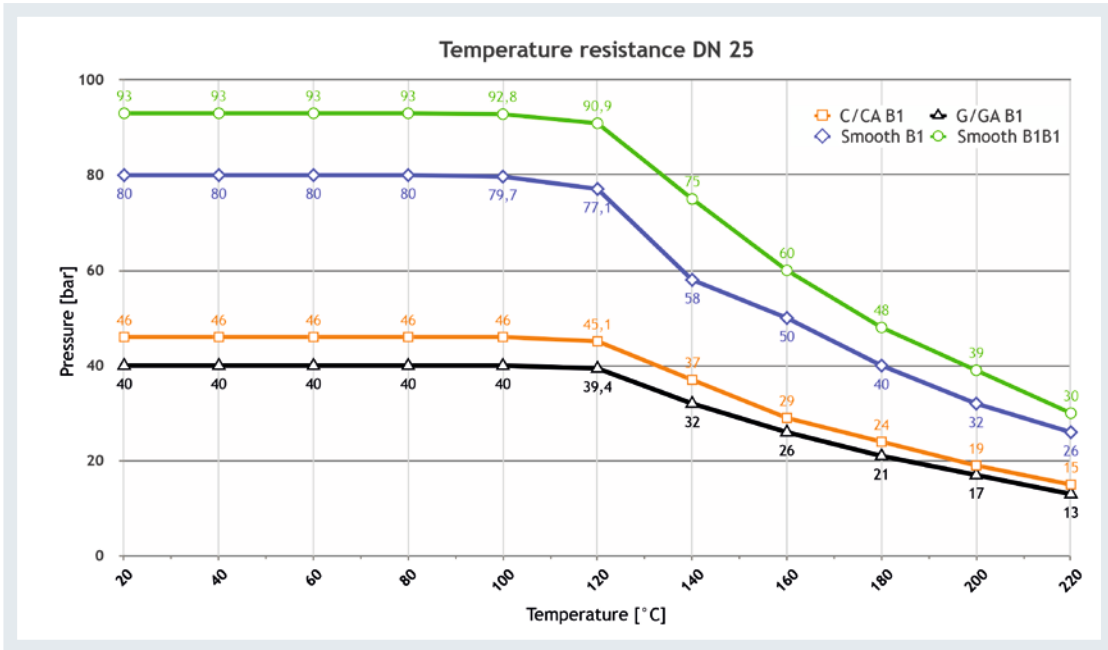
This includes among other things:

- The medium
- The dimensions such as length and nominal diameter
- The connections
- The operating pressure
- The operating temperature
- The bending radius
- The electrical conductivity
- The mechanical forces

The technical information on the operating conditions is very important to select the appropriate hose lines. As an example, you can see in the diagrams for PTFE hoses with various nominal diameters how the operating pressure depends on the temperature. The higher the operating temperature, the lower the maximum operating pressure.

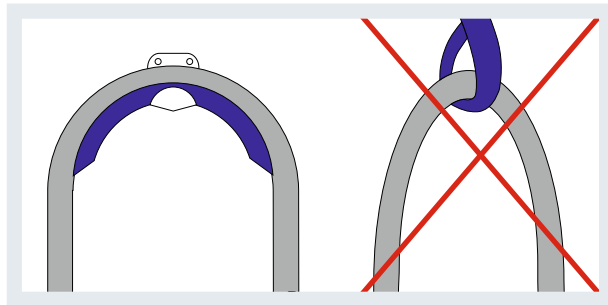
For detailed guidance on ordering hose lines, please refer to the download area on our website www.marsoflex.de. Of course, you can also call us any time for consultation.



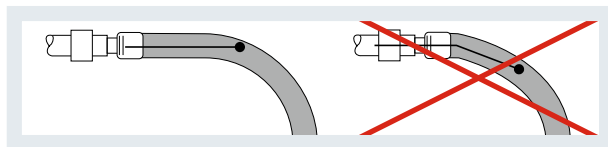


Correct use

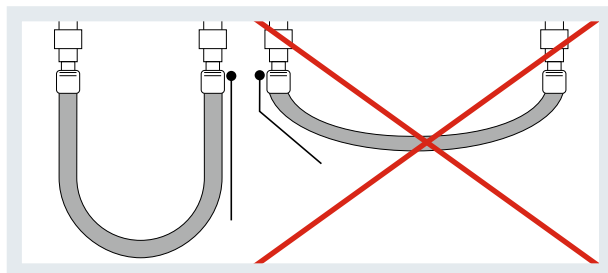
Do not bend excessively when hanging.
Use suspensions such as hose saddles or reels instead.



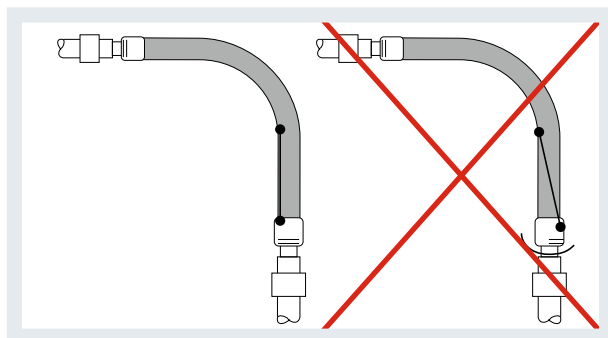
Do not kink the hose lines in the area of the connections. Transverse tensile forces must be avoided.



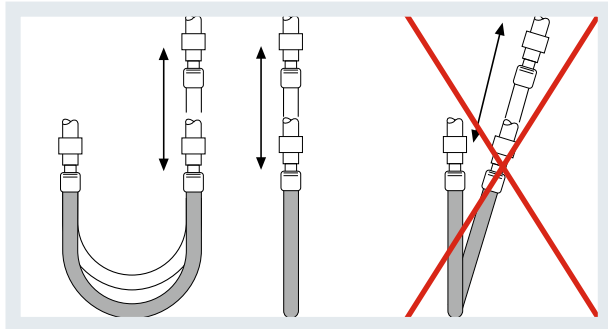
Use hose lines of sufficient lengths.
Transverse tensile forces must be avoided at the connections.



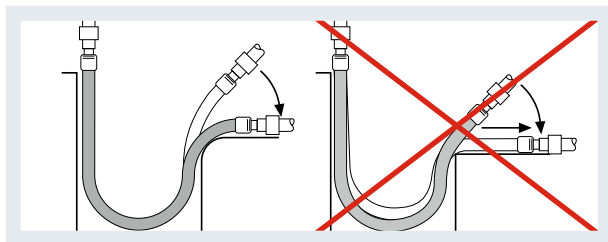
Please do not install twisted hose lines
and avoid torsional movements.



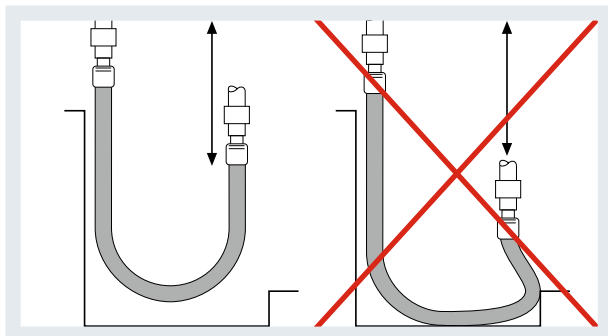
Install directions of movement at hose level.



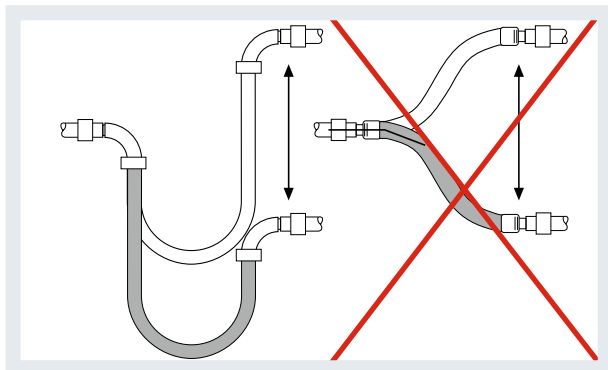
Do not install or pull hose lines across sharp edges to prevent damage or excessive kinking.



Ensure that enough space is available in case of hose movements. Please avoid excessive kinking or contact with floors or walls.



Avoid alternating bending stress.





Hose and coupling technology

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