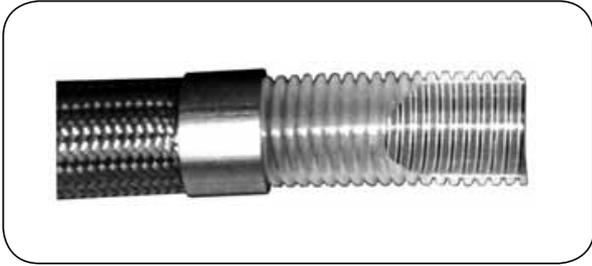


INDUSTRIAL HOSES - PTFE



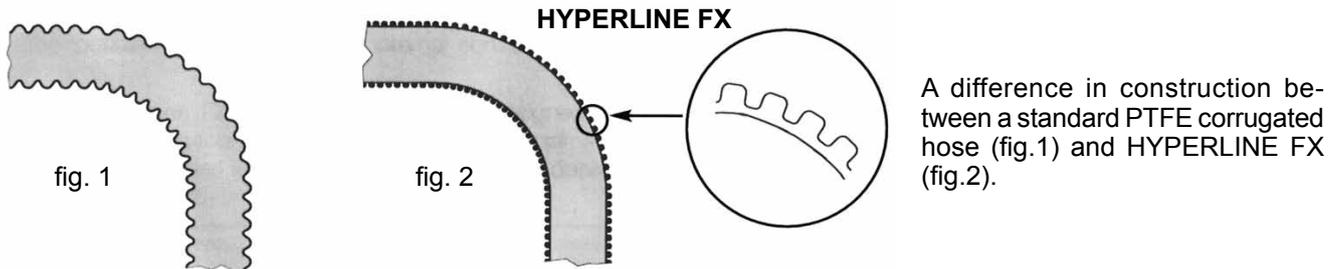
HYPERLINE FX

Material: Smooth inside, corrugated outside PTFE
Reinforcement: Single AISI 304 braid (SS version) or Kevlar braid (KB version)
Working temp.: From -70°C up to +260°C - KB version up to +180°C (working pressure depends on temperature)

Characteristics: HYPERLINE FX is made of PTFE which is smooth on the inside but corrugated one on the outside. The construction combines properties of smooth hoses (ease of cleaning, uninterrupted flow) and high flexibility that is specific to corrugated hoses. HYPERLINE FX SS is resistant to full vacuum up to +130°C.

For temperatures above +160°C for FXSS and +130°C for FXKB reduce the maximum working pressure given in the tables by 1% for each 1°C of temperature rise. Example: at +170°C temperature, maximum working pressure for AF-FXSS-10 hose is:
 $80 \text{ bar} - (170^\circ\text{C} - 160^\circ\text{C}) \times 1 = 80 \text{ bar} - 10\% = 72 \text{ bar}.$

Applications: HYPERLINE FX is recommended for all industrial applications demanding high flow rates, resistance to chemicals, temperature and permeation. Widely used in automotive industry (fuel installations, oil lines), refrigeration, steam and gas lines. Not suitable when PTFE lined fittings are required (BIOFLEX hose is then recommended).



A difference in construction between a standard PTFE corrugated hose (fig.1) and HYPERLINE FX (fig.2).

On special request, HYPERLINE is available with a braid made of different materials, e.g. polypropylene. HYPERLINE can be also supplied in 304 steel braid and additional cover made of EPDM rubber, silicone rubber, PVC, nylon or other material.

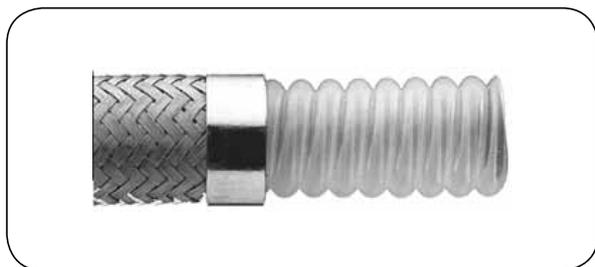
code (SS version)	code (KB version)	I.D. [mm]	O.D. (SS version) [mm]	O.D. (KB version) [mm]	working pressure SS/KB [bar]	bending radius SS/KB [mm]
AF-FXSS-06	AF-FXKB-06	6.8	9.6	9.6	88/62	19/38
AF-FXSS-08	AF-FXKB-08	7.9	10.6	10.6	84/59	19/38
AF-FXSS-10	AF-FXKB-10	10	13.5	13.5	80/56	25/50
AF-FXSS-13	AF-FXKB-13	13.6	17.5	17.5	60/42	38/76
AF-FXSS-16	AF-FXKB-16	16.7	21.4	21.4	50/35	50/100
AF-FXSS-19	AF-FXKB-19	19.8	24.2	24.2	42/29	63/126
AF-FXSS-25	AF-FXKB-25	26.4	31.7	31.7	40/28	75/150

note: for an antistatic version add "AS" at the end of the code

Z type fittings (see chapter HIGH PRESSURE) are used as a standard for HYDRALINE FX hose.

TUBES INTERNATIONAL® supplies hose assemblies according to customer specification (length, diameter, fitting type) on request.

INDUSTRIAL HOSES - PTFE



HYPERLINE V (VISIFLON)

Material: Helically corrugated PTFE
Reinforcement: AISI 304 braid (SS version)
 Polypropylene braid (PB version)
 No braid (TO version)
Working temp.: From -70°C up to +230°C (SS version)
 From -30°C up to +100°C (PB version)
 From -70°C up to +100°C (TO version)

Characteristics: The internal layer is made of corrugated, premium grade PTFE which ensures excellent flexibility and resistance to vibrations. A braid in SS version is made of AISI 304 annealed stainless steel wire. PB version with a braid made of orange polypropylene fibre is lightweight and highly resistant to chemicals. The maximum working pressure is 50% of the maximum working pressure of SS version. TO version has no braid, is very lightweight and enables visual control of the medium flow. The maximum working pressure is 2 bar. All versions are available as antistatic (AS), resistance $R < 10^8 \Omega$ according to ISO 8031 Annex A. HYPERLINE V SS is resistant to full vacuum up to +130°C temperature (TO and PB up to +80°C).

For temperatures above +130°C reduce the maximum working pressure given in the tables by 1% for each 1°C of temperature rise. For PB version by 5% for each 1°C above +80°C. Example: at +170°C temperature, maximum working pressure for AF-VFSS-10 is:
 $60 \text{ bar} - (170^\circ\text{C} - 130^\circ\text{C}) \times 1 = 60 \text{ bar} - 40\% = 36 \text{ bar}$

Safety factor (working pressure/ bursting pressure) is 1:4.

Applications: Due to the unique properties of PTFE (wide temperature range, excellent chemical resistance, non-stick surface), widely used to transfer chemicals, foodstuffs, fuels, oils, paints, solvents, adhesives, detergents, inks, steam, etc.

HYPERLINE V (AISI 304 steel braid)

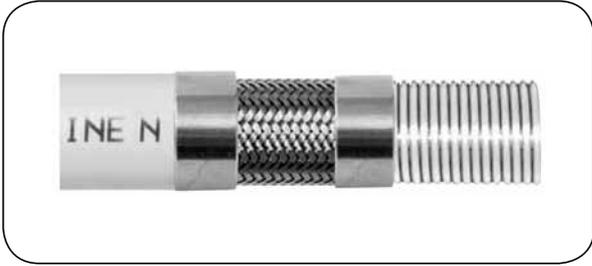
code*	DN [inch]	DN [mm]	O.D. [mm]	working pressure [bar]	bending radius [mm]	weight [kg/m]	maximum length [m]
AF-VFSS-10	3/8	6.3	11.95	60	19	0.13	40
AF-VFSS-13	1/2	9.5	15.25	47	25	0.20	40
AF-VFSS-16	5/8	12.7	21.2	40	38	0.25	30
AF-VFSS-19	3/4	16	22.7	32	50	0.34	30
AF-VFSS-25	1	22.2	30.6	26	63	0.47	25
AF-VFSS-32	1.1/4	28.2	36	25	75	0.63	20
AF-VFSS-38	1.1/2	35	47	20	115	0.90	10
AF-VFSS-50	2	47	61	15	130	1.25	10

* code example of an antistatic version: AF-VFSS-10AS, code example of PB version: AF-VFPB-10

Standard HYPERLINE V hose fittings: BSP female fittings with cone 60° and BSPT male fittings, made of zinc-plated steel, AISI 316 steel or polypropylene. Other fittings can also be used e.g. metric, JIC, NPT, flange, pipe, DIN 11851, SMS, TRICLOVER in straight, 45° or 90° option.

TUBES INTERNATIONAL® produces hose assemblies according to customer specification (length, diameter, fitting type) on request.

INDUSTRIAL HOSES - PTFE



PHARMALINE N

- Material:** Smooth inside, corrugated outside PTFE
- Reinforcement:** AISI 316 stainless steel braid
(from 1/2" additional AISI 316 steel helix)
- External layer:** White silicone
- Working temp.:** From -73°C up to +204°C (working pressure depends on temperature)

Characteristics: PHARMALINE hose is made of smooth inside and corrugated outside PTFE. The construction combines properties of smooth hoses (ease of cleaning, uninterrupted flow) and high flexibility that is specific to corrugated hoses. It is a lighter version of BIOFLEX hose, designed for traditional fitting-hose connection (crimping by a ferrule) as well as for RELINK reusable fittings. Hoses in all diameters are resistant to full vacuum up to 140°C. A standard PHARMALINE N hose in GP version has the internal layer made of PTFE in accordance with FDA No. 21 CFR 177.1550 standard. An antistatic version (AS) is also available - compliant with FDA No. 21 CFR 178.3297 standard. Both GP and GP AS hoses have been tested and they both conform to the requirements of USP Class VI. The material of the external layer- platinum cured white silicone rubber is compliant with USP Class VI and with FDA CFR-177-2600 standards. PHARMALINE N hose can be optionally manufactured in accordance with ATEX directive and adequately labelled according 94/9/EC Directive.

For temperatures above +130°C reduce the maximum working pressure given in the tables by 1% for each 1°C of temperature rise above +130°C. Example: at +170°C temperature, maximum working pressure for AF-PHGP-10 is:

$$100 \text{ bar} - (170^\circ\text{C} - 130^\circ\text{C}) \times 1 = 100 \text{ bar} - 40\% = 60 \text{ bar}$$

Safety factor (working pressure/ bursting pressure) is 1:4.

Applications: PHARMALINE N hose is designed for transfer applications in high purity conditions both inside and outside the hose. It is widely used in pharmaceutical, biotech, chemical and food industry. Excellent for other industrial applications, particularly those where hot medium is transferred, posing potential burn hazard due to accidental, direct contact with the hose. For example hot oil or steam transfer. Unlike silicone hoses, PHARMALINE N can undergo countless steam sterilization without the risk of degradation of the hose and/or adverse changes in its material.

PHARMALINE N - standard GP version

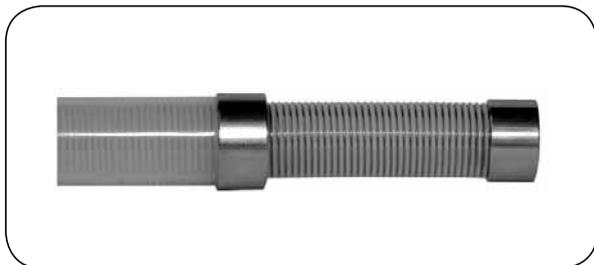
code	DN [mm]	I.D. [mm]	O.D. [mm]	working pressure [bar]	bursting pressure [bar]	bending radius [mm]	weight [kg/m]	maximum length [m]
AF-PHGP-N-06	6.4	6.8	11.6	80	320	19	0.17	30
AF-PHGP-N-10	9.5	9.5	15.5	70	280	25	0.22	30
AF-PHGP-N-13	12.7	13.5	21.4	60	240	38	0.37	30
AF-PHGP-N-16	16	16.5	25.2	50	200	50	0.52	30
AF-PHGP-N-19	19	19.8	28.5	45	180	63	0.65	30
AF-PHGP-N-25	25.4	26.1	37	40	160	100	0.88	30
AF-PHGP-N-32	32	32.5	44.6	35	140	130	1.30	30
AF-PHGP-N-38	38	38.8	51.7	30	120	170	1.70	30
AF-PHGP-N-50	50	51.5	65.6	28	112	210	2.36	30

note: for an antistatic version add "AS" at the end of the code

PHARMALINE N PTFE hoses are used with AF-PHX series fittings (e.g. AF-PHXTC - TRICLOVER fittings) and AF-BFXT3 series crimp ferrules. PHARMALINE N hoses can be also used with AF-T series fittings (for more - check „Fittings for PHARMALINE N and PHARMALINE X“).

TUBES INTERNATIONAL® produces hose assemblies according to customer specification (length, diameter, fitting type) on request.

INDUSTRIAL HOSES - PTFE



PHARMALINE X

Material: Smooth inside, corrugated outside PTFE
Reinforcement: From 1/2" AISI 316 steel wire helix
External layer: Transparent silicone
Working temp.: From -73°C up to +204°C (working pressure depends on temperature)

Characteristics: PHARMALINE X hose is made of smooth inside and corrugated outside PTFE. The construction combines the properties of smooth hoses (ease of cleaning, uninterrupted flow) and high flexibility that is specific to corrugated hoses. It is a lighter version of PHARMALINE N hose, designed for traditional fitting-hose connection. Hoses in all diameters are resistant to full vacuum up to +140°C. A standard PHARMALINE X hose, GP version has the internal layer made of PTFE according to the requirements of FDA 21 CFR 177.1550 standard. An antistatic version, marked AS, is also available, made in accordance with FDA 21 CFR 178.3297 standard. Both GP and GP AS hoses were tested and they both conform to the requirements of USP Class VI. The material of the external layer- platinum cured white silicone rubber is compliant with USP Class VI. PHARMALINE X hose can be optionally manufactured in accordance with ATEX directive and adequately labeled - Directive 94/9/EC.

For temperatures above +130°C reduce the maximum working pressure given in the tables by 1% for each 1°C of temperature rise above +130°C.

**Example: at +170°C temperature, maximum working pressure for AF-PHGP-X-10 is:
 6 bar - (170°C - 130°C) x 1 = 6 bar - 40% = 3.6 bar**

Safety factor (working pressure/ bursting pressure) is 1:4.

Applications: PHARMALINE X hose is designed for transfer applications in high purity conditions both inside and outside the hose. It is widely used in pharmaceutical, biotech, chemical and food industry. As an alternative to silicone hoses it allows for visual control of a medium in the hose, but it is significantly more resistant to numerous chemicals and temperature. Unlike silicone hoses, PHARMALINE X can undergo countless steam sterilization without the risk of degradation of the hose and/or adverse changes in its material.

code	DN [mm]	I.D. [mm]	O.D. [mm]	working pressure [bar]	bursting pressure [bar]	bending radius [mm]	weight [kg/m]	maximum length [m]
AF-PHGP-X-06	6.4	6.8	11.6	7.5	30	30	0.09	30
AF-PHGP-X-10	9.5	9.5	15.5	6	24	38	0.14	30
AF-PHGP-X-13	12.7	13.5	21.4	5.8	23	60	0.32	30
AF-PHGP-X-16	16	16.5	25.2	5	20	64	0.29	30
AF-PHGP-X-19	19	19.8	28.5	5	20	75	0.55	30
AF-PHGP-X-25	25.4	26.1	37	4	16	110	0.81	30
AF-PHGP-X-32	32	32.5	44.6	3	12	120	0.75	30
AF-PHGP-X-38	38	38.8	51.7	2	8	180	1.11	30
AF-PHGP-X-50	50	51.5	65.6	2	8	300	1.91	30

note: for an antistatic version add "AS" at the end of the code

PHARMALINE X PTFE hoses are used with AF-PHX series fittings (e.g. AF-PHXTC - TRICLOVER fittings) and AF-BFXT3 series crimp ferrules. PHARMALINE X hoses can be also used with AF-T series fittings (for more - check „Fittings for PHARMALINE N and PHARMALINE X”).

TUBES INTERNATIONAL® produces hose assemblies according to customer specification (length, diameter, fitting type) on request.