



Product overview

Flexible. Precise. Innovative.



Flexible. Precise. Innovative.

The full diversity

We bestow every tube with its own very special character, because no matter how diverse the demands of modern technology are, we have the perfect solution – in form of a high-performance tube.

We are a leading specialist for extruded tubes and profiles for applications in a wide range of industries. Our range of materials comprises almost all thermoplastically processible plastics.

Through our involvement with the Masterflex Group we combine the flexibility of a medium-sized operating with the strength of an international group. Efficiency and the know-how for responding to individual requests are the results of this alliance. Our customers appreciate this.

Customer orientation and creating a high level of satisfaction for each individual customer are not slogans for us, but rather the goals of our daily work. Our aims are achieved thanks to an innovative development department and to a professional sales department. Our tubing is specially tailored to meet your requirements. These demands have led to the development of a series of innovations for the widest variety of applications and branches.

Quality, precision, delivery reliability and competent advice are the cornerstones for the ongoing expansion of our market position.

Starting with the choice of material, cost effectiveness, and operational performance down to matters of design, our experts accompany you in a competent and comprehensive fashion, regardless of whether you require a series product from this catalogue or an individual custom item.

To predict our own everyday high quality requirements, we use special test and measuring equipment as well as laboratory equipment. As a result, we have the latest technology to safeguard the product quality at our disposal, right from the time of your initial inquiry until your product is shipped. Our quality management system which is certified in compliance with DIN EN ISO 9001 and DIN EN 13485 and which is constantly perfected, also vouches for this.

Furthermore, our company applies the established Environmental Management System complying with DIN ISO 14001 as well as the Energy Management System complying with DIN ISO 50001.



 **MASTERFLEX GROUP**

 **MASTERFLEX**

 **MATZEN & TIMM**

 **NOVOPLAST**
SCHLAUCHTECHNIK

 **FLEIMA-PLASTIC**

 **MASTERDUCT**

 **APT**

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Pneumatic tubing



... offers flexible solutions - even under great pressure.

PUR



Technical data sheet,
see page 26

Master-Tube PUR 98A

- lightweight
- high flexibility at low temperatures
- UV-resistant
- high elasticity
- good damping behaviour
- excellent abrasion resistance
- excellent resistance against tear propagation
- kink-resistant
- oil and grease resistant
- easily fitted
- minimal pressure loss
- available in a range of colours
- small bending radius
- unplasticized so no embrittlement
- individual printing is possible

Temperature range

-40 °C to +85 °C

Standard colours

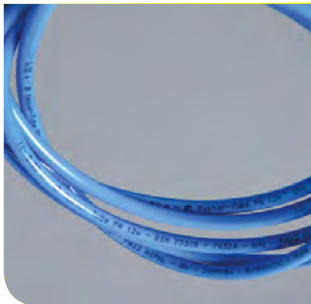
- natural
- black
- blue

Standard sizes

Outside-Ø:
4,0 to 16,0 mm

Special sizes and
colours upon request

PA



Technical data sheet,
see page 27

Master-Tube PA 12w

- lightweight
- excellent temperature resistance
- highly resistant to shock and impact
- excellent compressive strength
- high chemical resistance to oil, grease, fuels, solvent and hydraulic fluids
- excellent resistance to UV-rays
- highly resistant to stress cracking
- excellent abrasion resistance characteristics
- water insensitive
- easily fitted
- minimal pressure loss
- available in a range of colours
- calibrated

Temperature range

-40 °C to +90 °C

Standard colours

- natural
- black
- blue

Standard sizes

Outside-Ø:
4,0 to 22,0 mm

Special sizes and
colours upon request

PA



Technical data sheet,
see page 28

Master-Tube PA 6.12w

- flexible, as it contains plasticisers
- high impact strength
- good temperature resistance
- good UV resistance
- good chemical resistance
- calibrated
- good hydrolysis resistance
- good stress crack resistance
- high abrasion resistance
- very good suitability for push-in connections
- suitable for drag chains
- silicone free
- halogen free

Temperature range

-40 °C to +90 °C

Standard colours

- natural
- black
- blue

Standard sizes

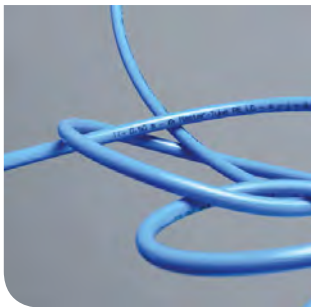
Outside-Ø:
4,0 to 22,0 mm

Special sizes and
colours on request

Pneumatic tubing



PE



Technical data sheet,
see page 29

Master-Tube PE LD

- lightweight
- physiologically safe and tasteless (complies with FDA regulation 21 CFR 177.120 c 2.1)
- low permeability for water, water vapor and gases
- resistant to various chemicals (see table of chemical resistance)
- sterilizable using ethylene oxide and gamma rays
- good dielectric characteristics
- easily fitted
- available in a range of colours
- low price

Temperature range

-30 °C to +70 °C

Standard colours

- natural
- black
- blue

Standard sizes

Outside-Ø:
4,0 to 18,0 mm

Special sizes and other colours upon request

PA-E



Master-Tube PA-E

- high flexible (in comparison with Nylon 11/12 soft)
- lightweight
- excellent temperature resistance
- highly resistant to shock and impact
- excellent resistance to UV-rays
- water insensitive
- unplasticized so no embrittlement
- good chemical resistance characteristics
- lasting flexibility
- calibrated
- easily fitted
- available in a range of colours
- available in a range of hardness grades

Temperature range

-40 °C to +80 °C

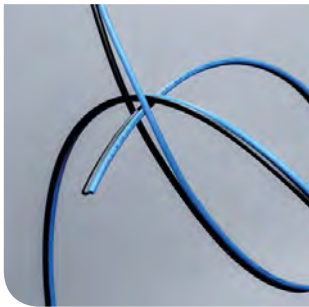
Dimensions and colours upon request

Multiple pneumatic hoses



... keeps everything under control - so that you don't lose track.

PA



Welding:	Non welding area:
approx. 60 mm	approx. 200 mm

Master-Tube PA Duopart®

- Burr-free surface by non-welded sections
- Extremely suitable for push-in connections
- Non-welded sections are recurrent
- Optional implementation of individual assembly lengths
- No time-consuming bundling of tubes by hand
- Tubes can be easily assigned as they are differently coloured
- Good chemical resistance to oils, greases, fuels, paint solvents, hydraulic fluids
- Material complies with DIN 73378/74324
- Low weight
- High impact strength
- Good pressure resistance
- Good stress-cracking resistance
- High abrasion resistance

Temperature range

-40 °C to +90 °C

Standard colour combinations

■ blue/black

Customised welding parameters and colours upon request

PUR



Technical data sheet, see page 26

Master-Tube PUR 98A Duo & Trio

- lightweight
- high flexibility at low temperatures
- good elasticity
- high buffering capacity
- excellent abrasion resistance
- kink-resistant
- unplasticized so no embrittlement
- easily fitting
- no bundling necessarily
- each tube has a different colour for easy identification
- easy separation
- air/electricity combination possible

Temperature range

-40 °C to +85 °C

Standard colour combinations

■ blue/black

■□ blue/black/natural

Special sizes, colour and hose combinations upon request

PA



Technical data sheet, see page 27

Master-Tube PA 12w Duo & Trio

- lightweight
- excellent temperature resistance
- highly resistant to shock and impact
- excellent compressive strength
- high chemical resistance to oil, grease, fuels, solvent and hydraulic fluids
- highly resistant to stress cracking
- excellent abrasion resistance characteristics
- easily fitting
- no bundling necessarily
- each tube has a different colour for easy identification
- air/electricity combination possible

Temperature range

-40 °C to +90 °C

Standard colour combinations

■ blue/black

■□ blue/black/natural

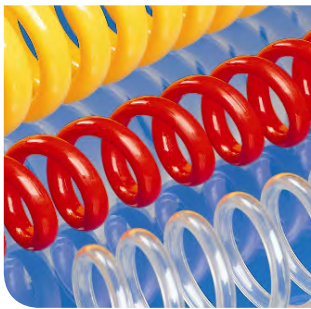
Note:
Since a burr-free separation of multiple PA tubes cannot always be implemented, the use of push-in connections should be avoided.

Pneumatic spirals



...this resilience keeps you from getting entangled in your everyday life.

PUR



Technical data sheet, see page 26

Master-Tube PUR 98A Spiral

- excellent springback characteristics
- high flexibility
- excellent abrasion resistance
- kink-resistant
- will not tear off at fittings
- no scratch painted surface by an elastomer character
- high operating length-tube length ratio (in comparison with nylon coil tubing)
- long service life
- small bending radius for easy handling

Temperature range

-40 °C to +85 °C

Standard colours

■ blue

Special colours upon request
Duo and trio spirals upon request

PA



Technical data sheet, see page 27

Master-Tube PA 12w Spiral

- excellent springback characteristics
- highly resistant against oil and grease
- lightweight
- excellent compressive strength
- space-saving
- low price as no rollers required
- easy handling
- choice of radial (tangential) or axial (straight) ends

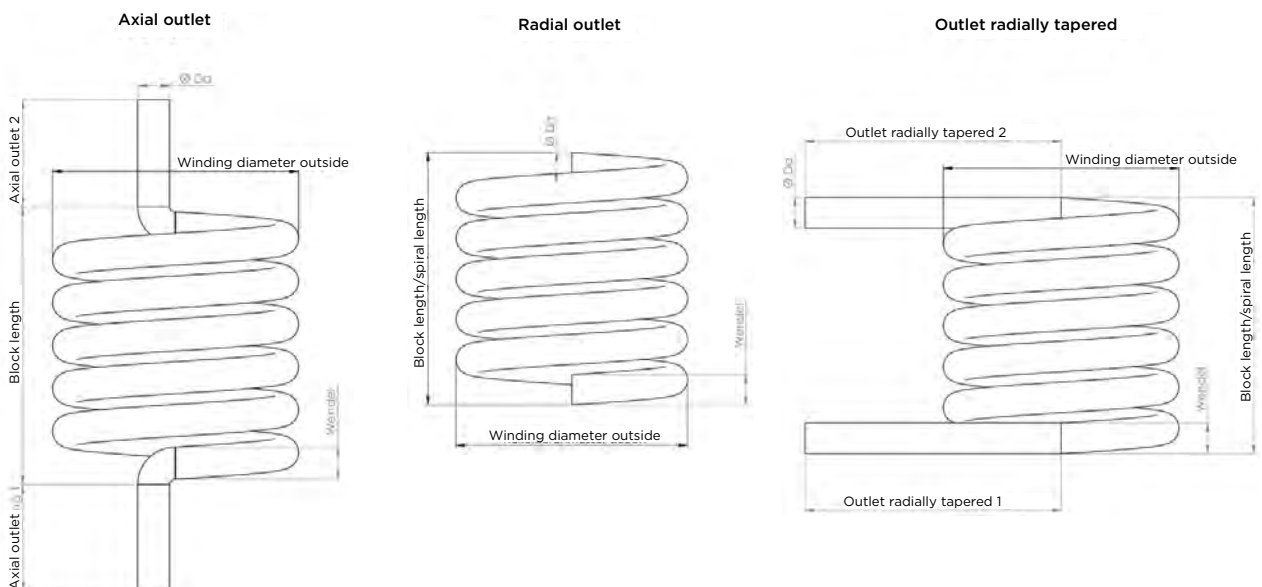
Temperature range

-40 °C to +90 °C

Standard colours

■ blue

Special colours upon request
Duo and trio spirals upon request



Fittings for pneumatic coil tubes



... an effortless connection with a strong grip.

PUR



Master-Tube PUR 98A Spiral

- for swivel and rigid fittings
- Brass blank or nickel-plated
- Possible connection types: Outside thread or quick-connect coupling
- metal spring as bend prediction
- Swivel couplings with double O-ring sealing
- max. operating pressure 15bar (test pressure 60bar)
- all connections reusable
- largest possible passage for optimum flow
- Exactly matched to PUR dimension and degree of hardness

Applications

For connection to PUR spiral hoses.

For mounting on compressed air lines and compressed air tools

PA



Master-Tube PA12w Spiral

- for swivel and rigid fittings
- Brass blank or nickel-plated
- possible connection types: outside thread or quick-connect coupling
- max. operating pressure 30bar
- all connections reusable
- adjusted for optimum flow rates
- exactly matched to PA hose dimensions

Applications

For connection to PA spiral hoses.

For mounting on compressed air lines and compressed air tools

Paint and lacquer hoses



... constant flexibility, even for colourful action.

PUR



Master-Tube PUR

- for powder conveying
- unplasticized
- no hardening and embrittlement
- kink resistant
- flexible
- high elasticity
- very good abrasion resistance
- long life span
- different colours available
- different hardnesses available
- antistatic version available

Temperature range

-40 °C to +85 °C

Dimensions and colours upon request

PA



Master-Tube PA

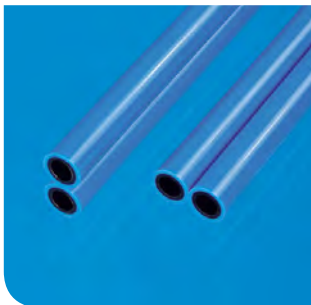
- good chemical resistance to lacquers and lacquer solvents
- low weight
- good temperature resistance
- can be used as low-pressure paint spray hose
- good UV resistance
- suitable for pneumatic control in paint spraying systems
- high abrasion resistance
- different colours available
- calibrated

Temperature range

-40 °C to +90 °C

Dimensions and colours upon request

PA/PUR



Master-Tube PA/PUR 2L

- multilayer hose construction
- can be used as low-pressure paint spray hose
- optimised property profile due to material combination
- good solvent resistance due to PA inner core
- good abrasion resistance due to PUR cover layer
- good pressure resistance due to PA inner core
- optimum flexibility due to PUR top layer and flexible special PA in the inner core

Temperature range

-40 °C to +85 °C

Dimensions and colours upon request

Hydrolysis- and microbe-resistant tubes



... put up fierce resistance – even withstanding micro-organisms.

PUR



Master-Tube PUR H

- hydrolysis- and microbe-resistant PUR special materials
- unplasticized
- no hardening and embrittlement
- kink-resistant
- extremely flexible at low temperatures
- high elasticity
- very good abrasion resistance
- UV-resistant
- available in a range of colours
- available in different hardness grades
- individual printing possible

Temperature range
-40 °C to +85 °C

Dimensions and colours upon request

PA PA-E PVDF PE PP PVC TPE



Hydrolysis- and microberesistant tubes (Master-Tube PA, Master-Tube PA-E, Master-Tube PVDF, Master-Tube PE, Master-Tube TPE)

- all materials hydrolysis- and microbe-resistant
- Material properties available on request
- available in a range of colours
- available in different hardness grades

Temperature range
depending on material

Dimensions and colours upon request

Antistatic and conductive tubes



... certain tensions are easily resolved.

PUR



Antistatic tubes Master-Tube PUR A

- highly resistant against abrasion
- high mechanical strength
- flexible
- contains no plasticizers so no embrittlement
- good shock absorbing properties
- kink resistant
- oil and grease resistant

Temperature range

-40 °C to +85 °C

Dimensions and colours upon request

PUR



Electrically conductive Master-Tube PUR EL

- electrically conductive; surface resistance $1 \times 10^4 - 1 \times 10^5 \Omega$
- low weight
- extremely flexible at low temperatures
- UV-resistant
- high elasticity
- good damping characteristics
- excellent wear resistance
- resistant to bending
- excellent tear propagation resistance
- oil and grease resistant
- quick installation
- small bending radius
- no embrittlement, because free of plasticisers
- customised overprint is possible

Temperature range

-40 °C to +85 °C

Standard colours

■ black

Dimensions upon request

PA



Electrically conductive Master-Tube PA EL

- low weight
- good pressure resistance
- high temperature resistance
- insensitive to water
- very good UV resistance
- good chemical resistance to oils, greases, fuels, paint solvents and hydraulic fluids
- calibrated, therefore suitable for connectors

Temperature range

-40 °C to +90 °C

Standard colours

■ black

Dimensions upon request

Temperature-resistant tubes



... give strong temperature differences the cold shoulder.

PVDF



Master-Tube PVDF

- excellent temperature resistance
- excellent pressure strength
- suitable for use with foodstuffs (FDA CFR 177.2510)
- suitable for medical applications (USP Class VI Standard)
- sterilizable
- non-flammable (UL94 V0)
- excellent resistance to UV-rays
- low gas permeability
- excellent mechanical properties

Temperature range

-40 °C to +150 °C

Standard colours

- natural

Dimensions and colours upon request

TPEE



Master-Tube TPEE

- high mechanical stability
- excellent abrasion and wear resistance
- very good ageing resistance
- high flexibility (elastomer)
- kink-resistant
- good chemical resistance
- more temperature-resistant than standard pneumatic tubes
- easily fitted
- high compressive strength with good flexibility

Temperature range

-40 °C to +120 °C

Dimensions and colours upon request

Notes
This tube may be damaged by water, steam (>60 °C), and microbes.

TPE



Master-Tube TPE

- highly flexible
- Selection of different hardness degrees
- comparable with rubber types
- good chemical resistance
- available in special grades suitable for use with foodstuff
- excellent dynamic fatigue strength
- high resistance to low temperatures
- excellent heat ageing resistance
- very low diffusion of liquid and gaseous media
- highly resilient

Temperature range

-40 °C to +125 °C

Dimensions and colours upon request

Chemical-resistant tubes



... are not impressed by aggressive substances.

PVDF



Master-Tube PVDF

- excellent temperature resistance
- excellent pressure strength
- suitable for use with foodstuffs (FDA CFR 177.2510)
- suitable for medical applications (USP Class VI Standard)
- sterilizable
- non-flammable (UL94 V0)
- excellent resistance to UV-rays
- low gas permeability
- excellent mechanical properties

Temperature range

-40 °C to +150 °C

Standard colours

natural

Standard sizes

Outside-Ø:
4,0 to 12,0 mm

Dimensions and special colours upon request

PP



Master-Tube PP

- excellent chemical resistance (see list of chemical resistance)
- highly resistant to heat
- good surface hardness
- safe to use with foodstuffs
- good dielectric strength
- low hygroscopicity

Temperature range

-25 °C to +90 °C

Dimensions and colours upon request

Food-safe tubing



... ensures that everything tasty stays tasty.

PUR



Master-Tube PUR 98A Food

- Compliant with the current Regulation (EU) No. 10/2011 including the amending regulations
- Conforms to Regulation (EU) No. 1935/2004 and the German Food and Feed Code (LFGB)
- Materials comply with the following food law regulations: FDA 21 CFR §177.2600 - FDA 21 CFR §178.2010
- Approved for food simulant: A, B, C, D1, D2, E (contact times/temp. and suitability according to declaration of compliance)

Temperature range

-40 °C to +85 °C

Standard colours

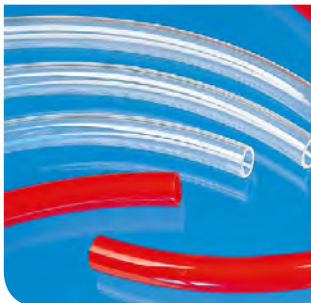
transparent

Standard sizes

Outside-Ø:
4,0 to 16,0 mm

Special sizes and other colours upon request

PUR



Master-Tube PUR F

- complies with the consumer article regulation, contained guideline 90/128 EWG (D)
- complies with FDA-regulations 21CFR 177.1680, 21CFR 175.105 and 21CFR 177.2600
- hydrolysis- and microbe-resistant
- unplasticized
- no hardening or embrittlement
- kink-resistant
- excellent flexibility at low temperatures
- good elasticity

Temperature range

-40 °C to +85 °C

Dimensions and colours upon request

PA



Master-Tube PA F

- complies with EU-regulations 90/128, 92/93, 93/9, 95/3, 96/11, 01/62 and 02/72
- complies with the FDA-regulations 21CFR 177.1500(9)
- good chemical resistance
- lightweight
- good temperature resistance
- good UV-resistance
- highly resistant to abrasion
- quick fitting
- available in a range of colours

Temperature range

-40 °C to +90 °C

Dimensions and colours upon request



PE

**Master-Tube PE F**

- physiologically safe and tasteless (complies with recommendation III of the BGA and complies with regulation 21CFR 177.120 c 2.1)
- lightweight
- low permeation values for water, water vapor and gases
- resistant to numerous chemicals (refer to chemical resistance table)
- can be sterilized (ethylene oxide and gamma rays)

Temperature range

-30 °C to +70 °C

Dimensions and colours upon request

TPE

**Master-Tube TPE F**

- according to FDA 21, CFR 177.2600 and 21 CFR 177.1210
- highly flexible
- good chemical resistance
- high flexibility at low temperatures
- very low diffusion of liquid and gaseous media
- excellent hot air ageing resistance
- comparable to rubber types
- excellent dynamic fatigue strength
- different colours available
- different hardnesses available
- individual printing possible

Temperature range

-40 °C to +125 °C

Dimensions and colours upon request

Insulating tubing



... bundles the energy flow - making a light go on.

PUR



Master-Tube PUR insulation

- highly flexible
- resistant to oil, water, ozone and UV rays
- unplasticized so no embrittlement
- good dielectric characteristics
- insulation class B (VDE standard 0530)
- manufactured in accordance with DIN 40 621
- excellent mechanical characteristics
- Shore A hardness 85°

Temperature range

-40 °C to +125 °C

Standard colours

■ black

Dimensions upon request

PUR



Master-Tube PUR Oval insulation

- inside groove pattern
- very flexible
- resistant against oil, water, ozone and UV radiation
- no embrittlement, because free of plasticisers
- good dielectric properties
- insulation class B acc. to VDE 0530
- manufactured according to the terms of DIN 40 621
- very good manufacturing properties
- Shore A hardness 85°

Temperature range

-40 °C to +125 °C

Standard colours

■ black

Dimensions upon request

TPEE



Master-Tube TPEE insulation

- manufactured according to the terms of DIN 40 621 B
- inside groove pattern
- high mechanical strength
- excellent wear resistance
- very good ageing resistance
- high flexibility (elastomer)
- resistant to bending
- good chemical resistance

Temperature range

-40 °C to +125 °C

Standard colours

■ black

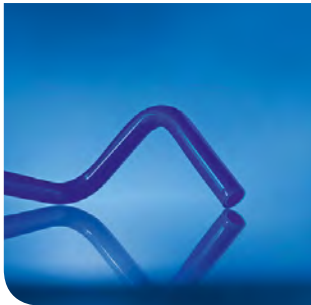
Dimensions upon request

Preformed tubes



... come from this sector and are perfect for every curve.

PUR



Master-Tube PUR 2D/3D

- individual mouldability as 2D and 3D parts
- flexible
- unplasticized
- no hardening or embrittlement
- kink-resistant
- high elasticity
- highly resistant to abrasion
- UV resistant
- available in a range of colours
- available in a range of hardness's

Temperature range

-40 °C to +85 °C

Dimensions upon request

PA



Master-Tube PA 2D/3D

- individual mouldability as 2D and 3D parts
- lightweight
- high chemical resistance to oil, grease, fuels, thinners and hydraulic fluids
- good temperature resistance
- good UV resistance
- highly resistant to abrasion
- quick fitting
- available in a range of colours
- calibrated

Temperature range

-40 °C to +90 °C

Dimensions upon request

Tubing that can be used for drag chains



... slides in an easy-going and smooth fashion.

PUR



Master-Tube PUR

- good sliding quality
- low weight
- extremely flexible at low temperatures
- UV-resistant
- high resilience
- good damping performance
- excellent abrasion resistance
- kink-resistant
- excellent resistance against tear propagation
- resistant to oil and grease
- easily fitted
- different colours available
- small bending radius
- Plasticizer-free, therefore no embrittlement
- Individual printing on request

Temperature range

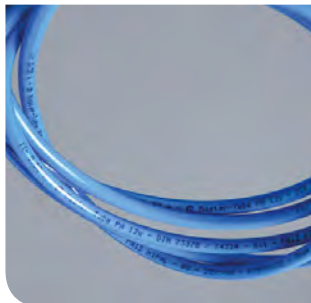
-40 °C to +85 °C

Standard colours

- natural
- black
- blue

Special sizes and other colours upon request

PA



Master-Tube PA

- good sliding quality
- low weight
- good temperature resistance
- high impact strength
- good pressure resistance
- good chemical resistance to oils, greases, fuels, paint solvents, and hydraulic fluids
- excellent UV resistance
- good stress cracking resistance
- high abrasion resistance
- water-resistant
- easily fitted
- low pressure loss
- different colours available
- calibrated

Temperature range

-40 °C to +90 °C

Standard colours

- natural
- black
- blue

Special sizes and other colours upon request

Brake tubing



... definitely a reliable braking sensation.

PA



Master-Tube PA 12w Brake

- lightweight
- highly resistant to oil, grease, solvent and hydraulic fluids
- excellent compressive strength
- highly resistant to shock and impact
- stable against light and heat
- easily fitted: calibrated and suitable for use with push-in fittings
- minimal pressure loss
- fully compliant with DIN 73 378 and DIN 74 324

Temperature range

-40 °C to +90 °C

Standard colours

■ black

Dimensions and special colours upon request

XFlame®



... keeps its ground - even when sparks are flying.

PUR



Technical data sheet,
see page 30

XFlame®

- inflammable according to UL94 V0/V2
- welding spray resistant
- halogen-free according to EN 50267-2-1 (corresponds with IEC 60754-1)
- self-extinguishing in case of fire
- LABS-free (free of substances that prevent paint adhesion)
- for use with drag chains
- plasticizer-free
- very good wear resistance
- bend-resistant
- elastic
- minimum pressure at 23°C: 60 bar (values determined under Novoplast testing conditions for tube size 6 x 2 x 10 mm)

Temperature range

-40 °C to +90 °C

Standard colours

- black
- blue
- red
- green
- white

Standard sizes

Outside-Ø:
4,0 to 16,0 mm

Dimensions and special colours upon request

PUR



Technical data sheet,
see page 31

XFlame hydro®

- inflammable according to UL94 V0/V2
- welding spray resistant
- halogen-free according to EN 50267-2-1 (corresponds with IEC 60754-1)
- self-extinguishing in case of fire
- LABS-free (free of substances that prevent paint adhesion)
- for use with drag chains
- plasticizer-free
- very good wear resistance
- bend-resistant
- very elastic
- minimum pressure at 23°C: 51 bar
- (Values determined under Novoplast testing conditions for tube size 6 x 2 x 10 mm)

Temperature range

-40 °C to +90 °C

Standard colours

- black
- blue
- red
- green
- white

Standard sizes

Outside-Ø:
4,0 to 16,0 mm

Dimensions and special colours upon request

PUR



XFlame soft®

- inflammable according to UL94 V0
- welding spray resistant
- halogen-free according to EN 50267-2-1 (corresponds with IEC 60754-1)
- self-extinguishing in case of fire
- LABS-free (free of substances that prevent paint adhesion)
- for use with drag chains
- plasticizer-free
- very good wear resistance
- bend-resistant
- highly elastic
- minimum pressure at 23°C: 34 bar
- (Values determined under Novoplast testing conditions for tube size 6 x 2 x 10 mm)

Temperature range

-40 °C to +90 °C

Standard colours

- black

Dimensions and colours upon request

Flame-resistant tubing



PVDF



Master-Tube PVDF

- hardly inflammable in compliance with UL94 V0
- good temperature resistance
- extremely high pressure resistance
- very good UV-resistance
- low gas permeability
- excellent mechanical properties
- resistant to a variety of chemicals

Temperature range

-40 °C to +150 °C

Standard colours

natural

Standard sizes

Outside-Ø:
4,0 to 12,0 mm

Dimensions and special colours upon request

TPE



Master-Tube TPE

- hardly flammable
- in accordance with UL94 V0
- highly flexible
- good chemical resistance
- high resistance to low temperatures
- minimum diffusion of liquid and gaseous mediums
- excellent heat ageing resistance
- comparable with rubber types
- excellent dynamic fatigue strength
- various colours and hardness grades available

Temperature range

-40 °C to +125 °C

Dimensions and colours upon request

Profile tubing



... offers various options – regardless of the form.

PUR



Master-Tube PUR Channeled profiles

- extremely flexible
- permanently elastic
- high flexibility at low temperatures
- highly resistant to abrasion
- excellent grip
- available in a range of hardness grades
- hydrolysis-resistant and microbe-resistant versions available
- made according to your technical specifications
- available in your choice of colour (corporate identity)

Temperature range
-40 °C bis +85 °C

Colours upon request

PUR



Master-Tube PUR flat

- flexible
- resistant to oil, water, ozone and UV rays
- unplasticized so no embrittlement
- good dielectric characteristics
- insulation class B (German Electrical Association, VDE, standard 0530)
- manufactured in accordance with DIN 40 621
- excellent mechanical characteristics
- shore A hardness 85°

Temperature range
-40 °C bis +85 °C

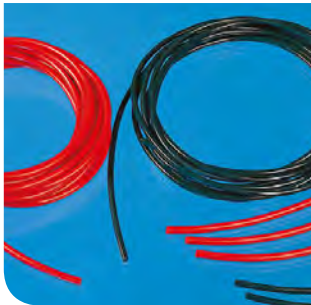
Colours upon request

Round and hollow belts



... really get things moving.

PUR



Master-Tube PUR round belts

- tensile and flexible
- high abrasion resistance
- oil and grease resistant
- long service life
- high working stress
- available in food safe quality grades
- easily welded to continuous belts

Temperature range

-40 °C to +85 °C

Dimensions and colours upon request

PUR



Master-Tube PUR hollow belts

- better flexibility than round belts with identical diameters
- high tensile strength
- excellent abrasion resistance
- oil and grease resistant
- long service life
- high working stress
- available in food safe quality grades
- easily welded to form continuous belt

Temperature range

-40 °C to +85 °C

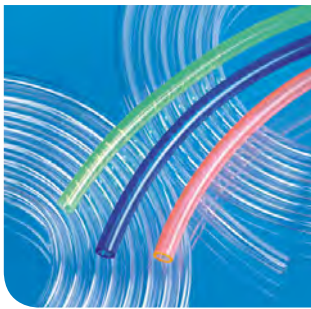
Dimensions and colours upon request

Water-cooling tubing



... for components that don't only want to keep cool, but also want to be cool.

PUR



Master-Tube PUR water-cooling

- high flexibility at low temperatures
- hydrolysis- and microbe resistant
- special PUR materials
- unplasticized
- no hardening or embrittlement
- kink resistant
- highly elasticity
- excellent abrasion resistance
- UV resistant
- available in a range of colours
- available in a range of hardness grades

Temperature range

-40 °C to +85 °C

Dimensions and colours upon request

TPE



Master-Tube TPE water-cooling

- highly flexible at low temperatures
- highly flexible
- hardly flammable in accordance with UL94 VO
- good chemical resistance characteristics
- minimal diffusion of liquid and gaseous mediums
- similar to types of rubber
- excellent dynamic fatigue resistance
- available in a range of colours
- available in a range of hardness grades

Temperature range

-40 °C to +125 °C

Dimensions and colours upon request

Cleanroom-manufactured tubing



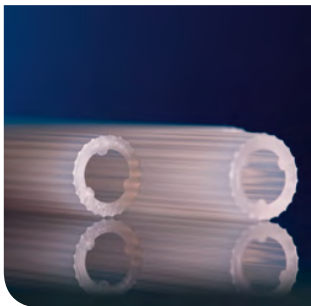
... the cleanest solution for highly specific requirements.



Reinraumgefertigte Schläuche

For the manufacturing of tubing for medical technology or other applications requiring especially clean products, cleanrooms of classes 8 and 6 are provided.

Here we process a variety of thermoplastic materials into tubes with outer diameters in the range of 0.5 mm to 12.0 mm.



In addition to the monolayer tubes, we offer multi-lumen tubes and multilayer tubes here.

We'll be glad to assist you in designing your bespoke tubing, completely focussing on meeting your requirements as regards the material, designs, dimensions, etc.



Expertise

- PUR
- PA
- PEBAX
- PVDF
- PE, HDPE, LDPE, LLDPE
- PP
- PVC
- TEEE
- TPE-S
- Special compounds
- Corporate colours
- Stripe marking
- Ink-jet printing

Technical data

Master Tube PUR 98A

Properties

- low weight
- extremely flexible at low temperatures
- UV-resistant
- high resilience
- good damping performance
- excellent abrasion resistance
- kink-resistant
- excellent tear resistance
- resistant to oil and grease
- quick assembly
- extremely suitable for push-in connections
- different colours available
- small bending radius
- plasticizer-free, therefore no embrittlement

Temperature range

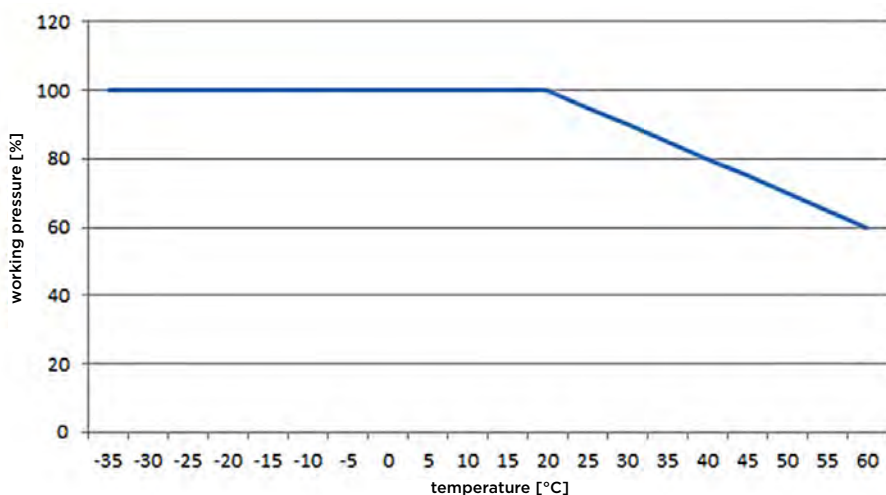
-40 °C to +85 °C

Areas of application

- pneumatic control lines
- machine manufacturing

Pressure diagram for Master Tube PUR 98A

Utilisation factor of the permissible pressure resistance (%) as a function of the temperature (°C).



Dimension ID* mm	Dimension WT* mm	Dimension OD* mm	Tolerance ID & OD mm	Weight g/m	max. operating pressure bar (at 23 °C)	smallest bending radius
2	1	4	± 0,10	11	20	20
2,7	0,65	4	± 0,10	9	11	20
3	1	5	± 0,10	15	15	25
4	1	6	± 0,10	19	12	30
5	1,5	8	± 0,10	37	13	40
5,5	1,25	8	± 0,10	32	11	40
5,7	1,15	8	± 0,10	30	10	40
6	1	8	± 0,10	27	8	40
6,5	1,75	10	± 0,10	55	12	50
7	1,5	10	± 0,10	49	10	50
8	1	10	± 0,10	34	6	50
8	2	12	± 0,15	77	12	60
9	1,5	12	± 0,15	60	8	60
11	2,5	16	± 0,20	129	11	80

* ID = inner diameter, WT = wall thickness, OD = outer diameter

Technical data

Master Tube PA12w

Properties

- low weight
- extremely suitable for push-in connections
- material complies with DIN 73378/74324
- good temperature resistance
- high impact strength
- good pressure resistance
- good chemical resistance to oils, greases, fuels, paint solvents, and hydraulic fluids
- very good UV-resistance
- good stress cracking resistance
- high abrasion resistance
- quick assembly
- different colours available
- calibrated

Temperature range

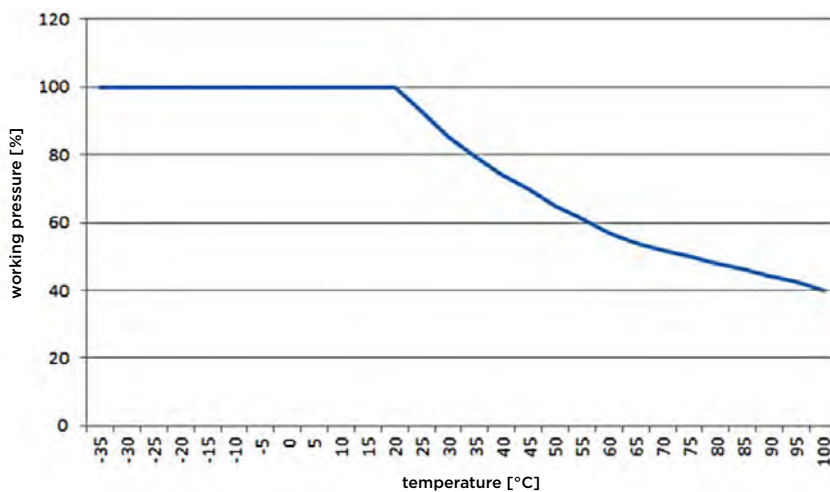
-40 °C to +90 °C

Areas of application

- pneumatic control lines
- automotive applications
- machine manufacturing

Pressure diagram for Master Tube PA12w

Utilisation factor of the permissible pressure resistance (%) as a function of the temperature (°C).



Dimension ID* mm	Dimension WT* mm	Dimension OD* mm	Tolerance ID & OD mm	Weight g/m	max. operating pressure bar (at 23 °C)	smallest bending radius
2	1	4	± 0,05	9,7	44	20
2,9	0,55	4	± 0,05	6,1	21	20
3	1	5	± 0,05	12,9	33	25
4	1	6	± 0,10	16,1	26	30
5	1,5	8	± 0,10	31,4	30	40
5,5	1,25	8	± 0,10	27,1	24	40
6	1	8	± 0,10	22,5	19	40
6	2	10	± 0,10	51,5	33	50
7	1,5	10	± 0,10	41,0	23	50
7,5	1,25	10	± 0,10	35,2	19	50
8	1	10	± 0,10	29,0	14	50
8	2	12	± 0,10	64,3	26	60
9	1,5	12	± 0,10	50,7	19	60
10	1	12	± 0,10	35,4	12	60
10	2	14	± 0,10	77,2	22	70
11	1,5	14	± 0,10	60,3	16	70
12	1,5	15	± 0,10	65,1	14	90
12	2	16	± 0,15	90,1	19	90
14	2	18	± 0,15	102,9	16	120
16	2	20	± 0,15	115,8	14	120
18	2	22	± 0,25	128,7	13	150

* ID = inner diameter, WT = wall thickness, OD = outer diameter

Technical data

Master Tube PA6.12w

Properties

- flexible, as it contains plasticisers
- high impact strength
- good temperature resistance
- good UV resistance
- good chemical resistance
- calibrated
- good hydrolysis resistance
- good stress crack resistance
- high abrasion resistance
- very good suitability for push-in connections
- suitable for drag chains
- silicone free
- halogen free

Temperature range

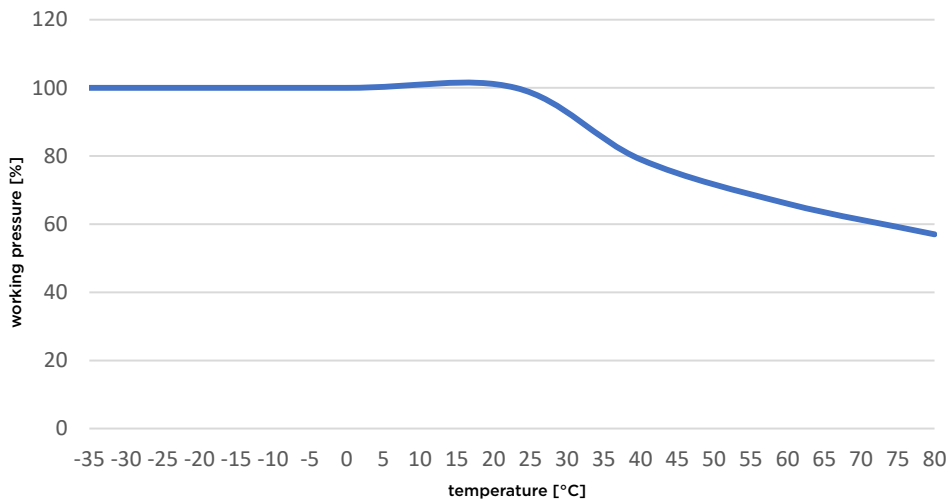
-40 °C to +90 °C

Areas of application

- Automotive
- Agricultural
- Painting Technology
- Mechanical Engineering
- Robots and automation
- Transport

Pressure diagram for Master Tube PA6.12w

Utilisation factor of the permissible pressure resistance (%) as a function of the temperature (°C).



Dimension ID* mm	Dimension WD* mm	Dimension OD* mm	Tolerance ID & OD mm	Weight g/m	max. operating pressure bar (at 23°C)	smallest bending radius
2	1	4	± 0,05	9,8	45	20
2,9	0,55	4	± 0,05	6,2	22	35
3	1	5	± 0,05	13,1	35*1	40**
4	1	6	± 0,10	16,3	29	35
5	1,5	8	± 0,10	31,9	35**	60**
5,5	1,25	8	± 0,10	27,6	25**	60**
6	1	8	± 0,10	22,9	20**	60**
6	2	10	± 0,10	29,4	35**	70**
7	1,5	10	± 0,10	41,7	24**	70**
7,5	1,25	10	± 0,10	35,7	20**	70**
8	1	10	± 0,10	29,4	15**	70**
8	2	12	± 0,10	65,3	33	80
9	1,5	12	± 0,10	51,5	22	105
10	1	12	± 0,10	35,9	13	110**
10	2	14	± 0,10	78,4	23**	120**
11	1,5	14	± 0,10	61,3	16**	120**
12	1,5	15	± 0,10	66,2	15**	140**
12	2	16	± 0,15	91,5	20**	140**
14	2	18	± 0,15	104,6	17**	170**
16	2	20	± 0,15	117,6	15**	170**
18	2	22	± 0,25	130,7	14**	200**

* ID = inner diameter, WT = wall thickness, OD = outer diameter **Calculated values, therefore deviations from the specifications possible

Technical data

Master Tube PE LD

Properties

- low weight
- physiologically harmless (complies with recommendation III of the BGA as well as FDA regulation 21 CFR 177.1520(c) 2.2 and EU, No 10/2011)
- low permeation values for water, water vapour and gases
- resistant to a wide range of chemicals (see resistance list)
- sterilisable (ethylene oxide and gamma rays)
- good dielectric properties
- quick assembly
- various colours available
- very good value for money

Temperature range

-30 °C to +70 °C

Areas of application

- pneumatic control lines
- machine manufacturing

Dimension ID* mm	Dimension WD* mm	Dimension OD* mm	Tolerance ID & AD mm	Weight g/m	max. operating pressure bar (at 23°C)	smallest bending radius
2	1	4	± 0,10	8,7	24	20
3	1	5	± 0,10	11,6	18	25
4	1	6	± 0,10	14,5	14	30
5	1,5	8	± 0,10	28,3	16	40
6	1	8	± 0,10	20,3	10	40
6	2	10	± 0,10	46,4	18	50
7	1,5	10	± 0,10	37,0	12	50
8	1	10	± 0,10	26,1	8	40
9	1,5	12	± 0,10	45,7	10	60
10	1	12	± 0,10	31,9	6	60
10	2	14	± 0,15	69,7	12	80
12	2	16	± 0,15	81,3	10	90
14	2	18	± 0,15	92,9	9	120

* ID = inner diameter, WT = wall thicknes, OD = outer diameter

Technical data

Master-Tube PEX

Properties

- Low weight
- low permeation values for water, water vapour and gases
- Resistant to a wide range of chemicals (see resistance list)
- Very good dielectric properties
- Quick assembly
- externally calibrated
- Suitable for push-in connectors and push-out connectors (due to significantly improved resistance to stress cracking and tear resistance)
- Improved creep resistance

Temperature range

-30 °C to +70 °C

Areas of application

- Mechanical engineering
- Robotics and automation
- Agriculture
- Painting technology

Dimension ID* mm	Dimension WD* mm	Dimension OD* mm	Tolerance ID & AD mm	Weight g/m	max. operating pressure bar (at 23°C)	smallest bending radius
2	1	4	±0,10	0,087	24,1**	20
3	1	5	±0,10	0,116	18,0**	25
4	1	6	±0,10	0,146	14,4**	30
5	1,5	8	±0,10	0,284	16,6**	40
6	1	8	±0,10	0,204	10,3**	40
6	2	10	±0,10	0,466	18,0**	50
7	1,5	10	±0,10	0,371	12,7**	50
8	1	10	±0,10	0,262	8,0**	40
9	1,5	12	±0,15	0,459	10,3	60
10	1	12	±0,15	0,320	6,5**	60
10	2	14	±0,15	0,699	12,0	80
12	2	16	±0,20	0,815	10,3**	90
14	2	18	±0,20	0,932	9,0**	120

* ID = inner diameter, WT = wall thickness, OD = outer diameter **Calculated values, therefore deviations from the specifications possible

Technical data

XFlame®

Properties

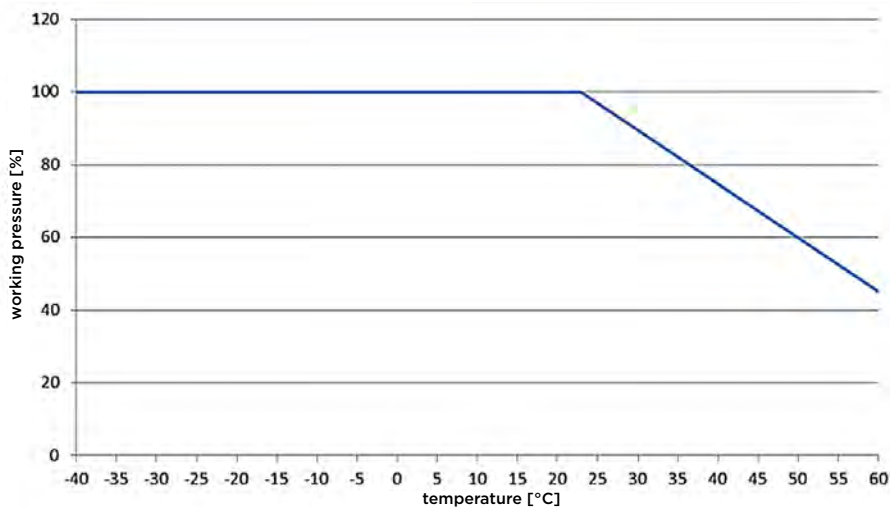
- hardly inflammable in compliance with UL94 V0/V2
- welding-splash-proof
- non-halogen in compliance with EN 50267-2-1 (corresponds to IEC 60754-1)
- self-extinguishing in the case of fire
- LABS-free (free of substances that prevent paint adhesion)
- for use with drag chains
- plasticizer-free
- excellent abrasion resistance
- kink-resistant

Temperature range

-40 °C to +90 °C

Areas of application

- welding units
- welding robots
- welding machines
- spot welding guns
- welding-related fields



Dimension ID* mm	Dimension WT*mm	Dimension OD*mm	Tolerance OD mm	Tolerance WT mm	Weight g/m	max. operating pressure bar (at 23°C)	smallest bending radius
2	1	4	± 0,10	-0,15	12	24	7
4	1	6	± 0,10	-0,15	19,9	16	8
4	2	8	± 0,15	+0,05/-0,10	47,9	24	9
6	2	10	± 0,15	± 0,10	63,8	20	15
8	2	12	± 0,15	+0,15 /-0,05	79,8	14	26
10	2	14	± 0,15	+0,15 /-0,05	95,8	13	38
11	2,5	16	± 0,15	+0,15 /-0,05	134,7	14	48

* ID = inner diameter, WT = wall thickness, OD = outer diameter

Technical data

XFlame® hydro

Properties

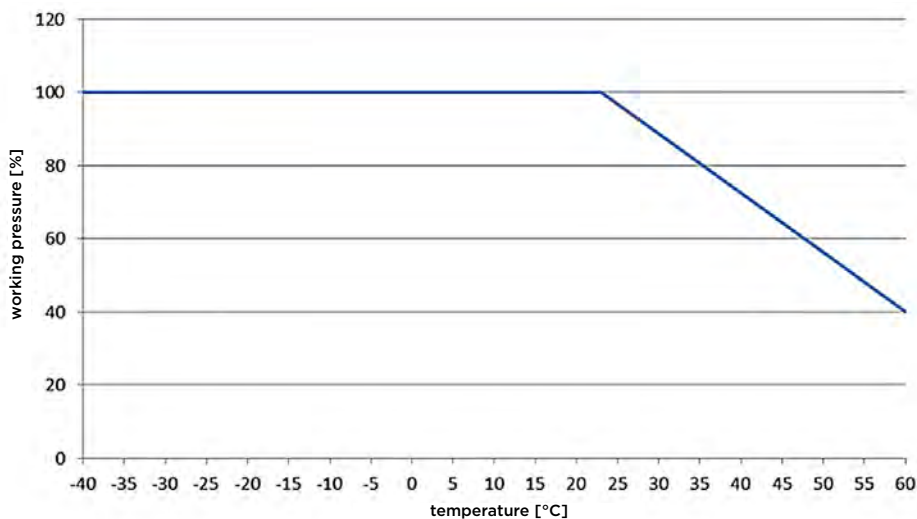
- inflammable according to UL94 V0/V2
- welding spray resistant
- -halogen-free according to EN 50267-2-1 (corresponds with IEC 60754-1)
- self-extinguishing in case of fire
- silicon-free (free of substances that prevent paint adhesion)
- for use with drag chains
- plasticizer-free
- very good wear resistance
- bend-resistant
- very elastic

Temperature range

-40 °C to +90 °C

Areas of application

- welding systems
- welding robots
- welding machines
- spot welding tongs
- associated welding areas
- cooling- and hot water applications
- pneumatic



Dimension ID*mm	Dimension WT*mm	Dimension OD*mm	Tolerance OD mm	Tolerance WT mm	Weight g/m	max. operating pressure bar (at 23°C)	smallest bending radius
2	1	4	± 0,10	-0,15	11,9	18	7
4	1	6	± 0,10	-0,15	19,8	12	8
4	2	8	± 0,15	+0,05/-0,10	47,5	21	9
6	2	10	± 0,15	± 0,10	63,3	17	15
8	2	12	± 0,15	+0,15 /-0,05	79,2	12	26
10	2	14	± 0,15	+0,15 /-0,05	95	10	38
11	2,5	16	± 0,15	+0,15 /-0,05	133,6	12	48

* ID = inner diameter, WT = wall thickness, OD = outer diameter

Technical data

Master-Tube PVDF

Eigenschaften

- very good resistance to chemicals
- good resistance to solvents
- good resistance to oil
- good UV resistance
- resistant to hydrolysis
- resistant to microbes
- plasticiser-free
- free from paint wetting impairment substances (LABS)
- high surface hardness
- low water absorption

Temperaturbereich

-40 °C to +150 °C

Einsatzbereiche

Agriculture, automotive, plant and mechanical engineering, robotics and automation, industry, aerospace technology, bulk materials and construction, maritime and rail transport, chemicals, surface technology, food & pharmaceuticals, plastics, conveying, lifting and feeding technology, white goods, textiles, printing and paper, vehicle construction, metal and toolmaking

Dimension ID*mm	Dimension WT*mm	Dimension OD*mm	Tolerance OD mm	Tolerance WT mm	Weight g/m	max. operating pressure bar (at 23°C)	smallest bending radius
2	1	4	± 0,10	± 0,10	17	111	10
4	1	6	± 0,10	± 0,10	28	72	25
6	1	8	± 0,10	± 0,10	39	53	43
8	1	10	± 0,10	± 0,10	50	41	75
10	1	12	± 0,10	± 0,10	62	32	85

* ID = inner diameter, WT = wall thickness, OD = outer diameter

You would like a specific offer?

Please complete this questionnaire so that we can offer you the most economical and safest solution.

Material/ Shore hardness (if known):

Dimensions (mm):

Inner- Ø

Wall thickness: _____

Outside- Ø

Tolerance (mm):

Inner- Ø

Wall thickness: _____

Outside- Ø

Application conditions and external influences (e.g. UV radiation, movement etc.):

Additional information:

Color:

Quantity (m):

Design (length/ roll length, winding):

Area of use:

Chemical requirements (media):

Temperature range (°C):

Operating pressure (bar):

Negative pressure (mm WG):

Please enter your name and address so we can provide you with the information as soon as possible.

Name/ Company:

Address:

Tel. & Fax:

E-Mail:

Chemical resistance

Medium (w = in watery solution)	PUR	PA	PE	PVDF	PVC	PP	TPE
1,4-dioxin	4	1	1	3	4	3	4
Acetone	4	1	1	3	5	1	2
Acetic acid	3	4	2	3	3	2	3
Acetic anhydride	4	1	3	4	4	1	2
Acetic acid butylester (butyl acetate)	4	1	2	3	4	3	4
Antifreeze fluid (automotive engineering)	2	1	1	1	1	1	1
Alum of all types, w	1	1	1	1	1	1	1
Aluminium salts, w	2	1	4	1	1	1	1
Ammonia, gaseous	1	1	1	2	1	1	1
Ammonia, w	4	1	1	4	1	1	1
Ammonium acetate, w	4	1	1	3	1	1	2
Ammonium carbonate, w	4	1	1	1	1	1	1
Ammonium chloride, w	1	1	1	1	1	1	1
Ammonium nitrate, w	1	1	1	1	1	2	2
Ammonium phosphate, w	1	1	1	1	1	1	1
Ammonium sulphate, w	1	1	1	1	1	1	1
Amyl alcohol, pure	2	1	1	1	1	1	1
Aniline	4	2	1	2	3	2	3
Aqua regia	4	4	4	3	2	4	4
Battery acid	1	3	1	1	3	1	1
Barium salts	1	1	1	1	1	1	1
Beef tallow	1	1	1	1	2	1	1
Beer	1	1	1	1	1	1	1
Benzaldehyde	3	1	1	1	3	2	3
Benzoic acid, w	4	1	1	1	1	2	2
Benzol	4	1	1	1	3	4	4
Bleaching lye (12% active chlorine)	4	3	1	1	3	3	3
Borax (sodium borate), w	1	1	1	1	1	1	2
Boric acid	3	2	1	1	1	2	3
Bone oil	1	1	2	1	3	1	1
Brake fluid	4	1	3	1	3	1	1
Bromine, liquid	4	4	4	1	4	4	4
Bromine vapours	4	4	4	1	4	4	4
Butane, liquid	1	1	1	1	2	1	1
Butane, gaseous	1	1	4	1	1	1	1
Butyl acetate (acid butylester)	4	1	4	2	5	4	5
Calcium chloride, w	1	1	1	1	1	1	1
Calcium nitrate, w	1	1	1	1	1	1	1
Caustic potash, w	1	1	1	1	2	1	1
Caustic soda, w	2	1	1	4	1	1	1
Citric acid	2	1	1	1	1	1	2
Chlorine, liquid	4	4	4	1	4	4	4
Chlorine, gaseous	4	4	4	1	4	4	4
Chlorobenzene (monochlorobenzene)	3	3	4	1	4	3	4
Chloroform	4	3	4	1	4	4	4
Chlorosulfuric acid	4	4	4	1	4	3	4
Coconut oil	1	1	2	1	1	2	3
Cod liver oil	1	1	1	1	4	2	3
Cocoa	1	1	1	1	1	1	1
Coffee	1	1	1	1	1	1	1
Cooking oil, vegetable	2	1	4	1	2	1	1
Cooking oil, animal	2	1	3	1	2	1	1
Clove oil	1	1	4	1	2	2	3

Medium (w = in watery solution)	PUR	PA	PE	PVDF	PVC	PP	TPE
Chrome baths, techn.	3	4	1	1	1	2	3
Chromium salts (bivalent & trivalent)	3	1	1	1	1	1	1
Chromo-sulphuric acid	3	4	1	1	2	4	4
Chromic acid	4	4	2	1	3	2	4
Coca-Cola	1	1	1	1	1	1	1
Cyclohexanol	4	1	1	1	5	4	4
Cyclohexanone	1	1	4	3	5	4	5
Corn oil	2	1	4	1	1	2	3
Carbon disulphide	3	1	4	1	4	4	4
Carbon tetrachloride	3	1	4	1	4	4	4
Cresol	4	4	4	1	4	2	3
Cresol, w	4	3	4	1	4	3	4
Decahydronaphthalene (Dekalin)	2	1	1	1	1	3	4
Detergent	1	1	1	1	2	1	1
Dibutylphthalate (plasticizer)	3	1	3	1	3	2	3
Diesel oil	1	1	2	1	2	2	3
Dimethyl ether	2	1	2	2	2	4	4
Dimethylformamide	4	1	1	5	4	1	2
Dishwashing agent, liquid	1	1	1	1	1	1	1
Ethyl acetate	4	1	2	3	5	4	5
Ethylene chloride	2	3	4	1	4	3	4
Ethyl hexanol (2-ethyl hexanol)	4	1	4	1	4	1	2
Formaldehyde, w	2	3	1	1	3	1	2
Formic acid	4	4	2	1	4	3	3
Formalin	2	3	1	1	2	2	3
Fruit juices	1	1	1	1	1	1	1
Fuels (all types of petrol)	2	1	4	1	4	3	3
Gin	1	1	1	1	2	1	1
Glycerine	1	1	1	1	1	1	1
Glycol	2	1	1	1	1	1	1
Heating oils	1	1	3	1	4	2	3
Heptane	2	1	1	1	1	2	3
Hexane	2	1	1	1	1	3	4
Honey	1	1	1	1	1	1	1
Hydrochloric acid (up to 20%)	2	4	1	1	2	2	3
Hydrofluoric acid	3	4	3	1	4	1	3
Hydrogen bromide	4	4	4	1	4	2	3
Hydrogen chloride, gaseous	2	4	1	1	2	2	3
Hexanaphthene (hexahydrobenzene)	2	1	1	1	1	3	4
Hydrogen peroxide, w	2	2	1	1	3	4	4
Isooctane	1	1	4	1	1	2	3
Isopropyl	3	1	1	1	3	1	1
Ink	1	1	1	1	1	1	1
Iron salts	2	1	1	1	1	1	1
Jelly	1	1	1	1	1	1	1
Lactic acid	3	2	2	1	3	1	2
Lanolin	1	1	3	1	2	3	4
Lemonades	1	1	1	1	1	1	1
Lemon juice	1	1	1	1	1	1	2
Linseed oil	1	1	1	1	3	1	1
Liqueurs	1	1	1	1	2	1	1
Magnesium salts, w	1	1	1	1	1	1	1
Margarine	1	1	3	1	1	1	1
Methanol	2	1	1	1	3	1	1

Chemical resistance (at room temperature)

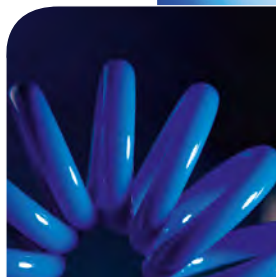
1 resistant | 2 resistant to a great extent | 3 partially resistant | 4 non-resistant | 5 soluble

Chemische Beständigkeiten

Medium (w = in watery solution)	PUR	PA	PE	PVDF	PVC	PP	TPE
Methylene chloride (dichloromethane)	4	3	4	2	4	3	4
Methyl ethyl ketone	4	1	4	3	3	1	2
Milk	1	1	1	1	1	1	1
Motor oils (automotive engineering)	2	1	3	1	3	2	3
Mercury	1	1	1	1	3	1	1
Mercury salts, w	1	1	1	1	3	1	1
Mustard	1	1	1	1	1	1	1
Nail varnish	4	1	1	1	4	1	2
Nail varnish remover	4	1	1	1	4	2	3
Naphthalene (rock oil)	1	1	4	1	2	2	3
n-butyl alcohol (n-butanol)	4	1	4	1	3	2	3
Nickel salts, w	1	1	1	1	1	1	1
Nitrobenzene	4	2	4	1	4	3	4
Nitric acid (up to 25%)	5	4	2	1	3	3	4
Octane	1	1	1	1	4	1	2
Oil No. 3 (in compliance with ASTM D390-59)	1	1	3	1	2	1	3
Oleic acid	1	2	2	1	2	2	3
Oleum (conc. fuming sulphuric acid)	4	4	4	4	4	4	4
Olive oil	1	1	1	1	2	1	1
Oxalic acid, w	4	2	1	1	3	1	1
Ozone (below 0.5 ppm)	1	1	4	1	3	3	4
Potassium chloride, w	1	1	1	1	1	1	1
Potassium dichromate, w	1	3	1	1	1	1	1
Potassium iodide, w	2	1	1	1	1	1	1
Potassium nitrate, w	2	1	1	1	1	1	1
Potassium permanganate, w	3	3	1	1	1	1	1
Potassium sulphate	1	1	1	1	1	1	1
Pine needle oil	2	1	2	1	2	1	2
Pine needle oil	2	1	2	1	3	1	2
Potassium carbonate	3	1	1	4	1	1	1
Potassium chlorate, w	2	2	1	1	1	1	1
Palm kernel oil	2	1	4	1	3	3	3
Paraffin	2	1	3	1	1	1	1
Paraffin oil	2	1	3	1	1	2	3
Perfume	1	1	1	1	4	2	2
Pectin	1	1	1	1	1	1	1
Petroleum ether	1	1	4	1	3	2	3
Petroleum	2	1	3	1	2	2	2
Pepper	1	1	1	1	1	2	2
Peppermint oil	1	1	3	1	2	1	2
Phenol	4	4	4	1	4	1	2
Phosphorus pentoxide	2	3	1	1	1	1	1
Phosphoric acid	3	4	4	1	1	2	3
Propane, liquid	2	1	4	1	1	2	3
Propane, gaseous	2	1	3	1	1	2	3
Pyridine	5	1	1	3	4	3	4
Rum	1	1	1	1	2	1	1
Shampoo	1	1	1	1	1	1	1
Sodium bicarbonate, w	1	1	1	1	1	1	1
Sodium bisulphite, w	2	1	1	1	1	1	1
Sodium carbonate, w	1	1	1	1	1	1	1

Medium (w = in watery solution)	PUR	PA	PE	PVDF	PVC	PP	TPE
Sodium chlorate, w	2	2	1	1	1	1	1
Sodium chloride w	1	1	1	1	1	1	1
Sodium hydroxide (caustic soda)	4	1	4	4	4	1	1
Sodium hypochlorite, w	2	2	1	1	1	1	1
Sodium nitrate, w	1	1	1	1	1	1	1
Sodium nitrite, w	1	2	1	1	1	1	1
Sodium perborate, w	2	1	1	1	3	1	1
Sodium phosphates, w	2	1	1	1	1	1	1
Sodium sulphate, w	1	1	1	1	1	1	1
Sodium sulphide, w	1	1	1	4	1	1	1
Sodium sulphite, w	1	1	1	1	1	1	1
Sodium thiosulphate (antichlor), w	2	1	1	1	1	1	1
Sugar, solution	1	1	1	1	1	1	1
Silver salts, w	1	1	1	1	1	1	1
Silicone oil	1	1	1	1	4	1	1
Soda	1	1	1	1	1	1	1
Soy oil	2	1	4	1	2	1	1
Starch, starch solution	1	1	1	1	1	1	1
Stearic acid	1	2	4	1	1	2	3
Sodium thiosulphate	2	1	1	1	1	1	2
Sulphur	1	1	4	1	4	1	1
Sulphur dioxide, gaseous	3	1	1	1	2	4	4
Sulphuric acid (up to 50%)	2	4	1	1	3	2	3
Soap solution	2	1	1	1	1	1	1
Seawater	1	1	1	1	1	1	1
Sodium silicate	3	1	1	1	1	1	1
Tetrahydrofuran	4	1	3	2	4	3	4
Tetra hydro naphthalene (Tetralin)	2	1	4	2	1	4	4
Toluol	4	1	4	1	4	3	4
Tin(II)chloride	1	1	1	1	1	1	1
Trichloroethylene	4	2	4	1	4	4	4
Tea	1	1	1	1	1	1	1
Tar (hot tar)	4	1	3	1	3	2	3
Turpentine oil	4	1	3	1	3	4	4
Tartaric acid, w	1	1	1	1	1	1	1
Urea, w	1	1	1	1	1	1	1
Vanilla	1	1	1	1	1	1	1
Vaseline	1	1	3	1	2	2	3
White spirit	1	1	4	1	3	3	4
Wine	1	1	1	1	1	1	1
Xylene	4	1	4	1	4	4	4

The data given in the table have been elaborated and compiled on the basis of tests performed by our company, recommendations of our suppliers of raw materials, and based on field reports from our customers. Since individual operating conditions have an additional impact on the applicability of each tube, the data can only be regarded as guide values. In cases without any reports of real experience we advise the operator to carry out a preliminary test in order to avoid risks. We especially recommend this procedure when using mixtures of materials.



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