



DOCUMENTATION SHEET

Rubber Bellows
Type 4K Aramid Silicone

4K SILICONE

4K SILICONE	Bellows dimensions				Allowable displacement			Weight (*) [kg]
	ØA [mm]	ØB [mm]	ØC [mm]	ØD [mm]	Axial [mm]	Lateral [mm]	Angular [°]	
Art.nr without clamps KS033.7L175B00	33,7	39,4	45	175	± 10	± 10	45	0,18
KS038.0L175B00	38,0	44,0	45	175	± 12	± 12	45	0,19
KS042.4L175B00	42,3	48,3	45	175	± 12	± 12	45	0,20
KS048.3L175B00	48,3	54,0	45	175	± 14	± 14	45	0,21
KS060.3L195B00	60,3	66,0	45	195	± 14	± 14	30	0,23
KS063.5L195B00	63,5	69,2	45	195	± 14	± 14	30	0,26
KS076.1L195B00	76,1	81,8	45	195	± 14	± 14	30	0,30
KS088.9L195B00	88,9	94,6	45	195	± 18	± 18	30	0,34

(*) Weight including hose clamps

TABLE

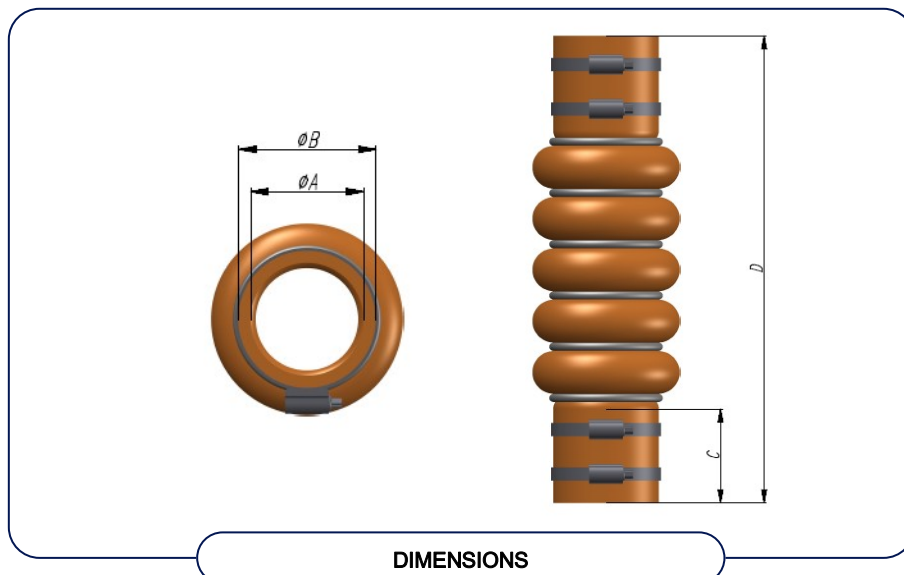
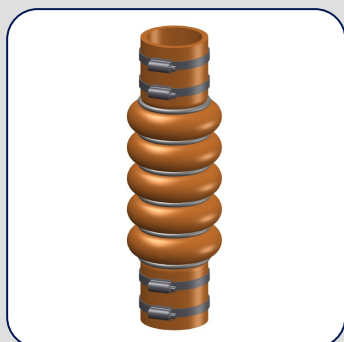
The bellows are manufactured in brown synthetic rubber, with a black inner liner, reinforced with synthetic fabric to achieve a high mechanical strength. They are suitable for use with cooling water, fuel and lubrication oil pipework systems up to 220°C.

The burst pressure safety factor is 3 times the working pressure of 4 bar.

The minimum workpressure (absolute) is 80 to 90 kPa, depending on compensator size and can be lowered by fitting vacuum support rings. The mentioned pressures are guaranteed by using the recommended (stainless steel) clamps according to the table above.

WORM SCREW HOSE CLAMPS AISI 316	Diameter range [mm]
KSK025W230	32-44 (for KD033.7S000 and KD38.0S000)
KSK030W230	38-50
KSK040W230	44-56 (for KD042.2S000 and KD48.3S000)
KSK045W230	50-65
KSK050W230	58-75 (for KD060.3S000 and KD63.5S000)
KSK060W230	68-85 (for KD076.1S000)
KSK080W230	77-95 (for KD088.9S000)

TABLE



DIMENSIONS



General Fluoro

Because silicone rubber is permeable to hydrocarbons, fluorosilicone liners are often used in automotive applications to prevent oil seepage through the hose wall. This seepage could otherwise swell and damage the hose and also leave a sticky deposit on the outside of the hose that attracts dirt. We recommend and use fluorosilicone rubber (FMVQ) for liners because of its stable physical properties throughout the operating temperature range of -55°C to +250°C. Unlike fluorocarbon (FKM or FPM) liner materials fluorosilicone does not exhibit thermoplastic tendencies, this allows the dynamic properties of the fluorosilicone liner to more closely follow those of the hose outer resulting in a product that does not become brittle at low temperatures or excessively soft at high temperature. Fluorosilicone lined turbocharger and intercooler hoses are often specified for use on engines that have to meet Euro 3 and 4 emission levels and therefore have crankcase oil mist recirculated through the induction system.

As an addition to the 3K range, the 4K multiple bellows with support rings have been designed especially to provide small, low weight bellows which combine flexibility and high medium temperature with simple installation. The 4K ranges accommodate misalignment, axial and lateral pipework movements and reduce the transmission of noise, vibration and shock.

The bellows are manufactured in brown synthetic rubber, with a black inner liner, reinforced with synthetic fabric to achieve a high mechanical strength. They are suitable for use with cooling water, fuel and lubrication oil pipework systems up to 220°C.

The burst pressure safety factor is 3 times the working pressure of 4 bar. The minimum work-pressure (absolute) is 80 to 90 kPa, depending on bellow size and can be lowered by fitting vacuum support rings.

4K FLUORO
SILICONE

Original properties	Result
Hardness shore A	70°
Specific gravity	1.45
Tensile strength	6 MPa
Elongation at break	230%
Compression set, 24 hours at 150°C	40%
Rebound resilience	38%
Colour	Grey
Air aged 10 days at 200°C	
Hardness shor A	66°
Tensile strength	4.8 MPa
Elongation at break	320%
70 hours at 150°C IRM 903 oil	
Hardness shore A	65°
Tensile strength	5.5 MPa
Elongation at break	300%
Volume change	+10%

TABLE



4K ARAMID SILICONE

General Aramid

Silicone elastomer hoses of various shapes that use a peroxide vulcanising system, high temperature stable iron oxide pigmentation, meta-aramid fabric reinforcement and a silicone or fluorosilicone liner when necessary.

Typical applications are automotive turbocharger outlet, hot side intercooler hoses and EGR connectors. They are also used in many industrial high temperature applications where they are suitable for use at working temperatures of up to 220°C and intermittent exposure up to 250°C.

Fluorosilicone lined hoses are generally specified for use on engines that have to meet Euro 3 and 4 emission levels and have crankcase oil mist recirculation. The fluorosilicone liner prevents oil permeation through the hose wall and subsequent hose failure.

Please see separate data sheets for silicone and fluorosilicone physical properties.

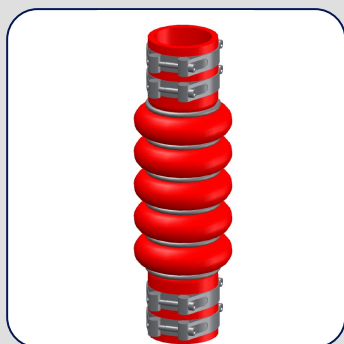
Reinforcement plies are heavy duty knitted or woven meta-aramid (otherwise known as Nomex® or Conex®) fabric depending on the hose type, diameter and expected severity of the service conditions.

As an addition to the 3K range, the 4K multiple bellows with support rings have been designed especially to provide small, low weight bellows which combine flexibility and high medium temperature with simple installation.

The 4K ranges accommodate misalignment, axial and lateral pipework movements and reduce the transmission of noise, vibration and shock.

The bellows are manufactured in brown synthetic rubber, reinforced with synthetic fabric to achieve a high mechanical strength. They are suitable for use with cooling water, fuel and lubrication oil pipework systems up to 220°C.

The burst pressure safety factor is 3 times the working pressure of 4 bar. The minimum work-pressure (absolute) is 80 to 90 kPa, depending on bellow size and can be lowered by fitting vacuum support rings.



EXAMPLE



General Polyester

Silicone elastomer hoses of various shapes with polyester fabric reinforcement having an upper temperature capability of 170°C.

For higher temperature rated hoses please refer to the aramid reinforced hose data sheet.

Reinforcement is from two to five plies of medium duty knitted polyester fabric depending on the chosen diameter and expected severity of the service conditions.

A “rubber only” liner is used to prevent the leakage which could otherwise occur due to exposed fabric on the inside of the hose. Hoses are available in our standard colours of Blue, Black, Red or Yellow and special colours can be supplied depending on quantity. Surface finish is shiny gloss for straight lengths and cut pieces, with a choice of gloss or semi-matt cloth finish for elbows and reducers.

Typical applications are vehicle cooling systems, cold side intercooler air hoses and general industrial use within the temperature range of -55°C to +170°C. Helical wire reinforcement can also be incorporated if required for resistance to collapse under vacuum and for resistance to kinking at tight bend radii. Polyester reinforced silicone hoses are constructed to meet the general requirements of SAE J20R1 or R4 HT CLASS A. Hoses with integral helical wire reinforcement meet the general requirements of SAE J20R2 or R5 HT CLASS A.

As an addition to the 3K range, the 4K multiple bellows with support rings have been designed especially to provide small, low weight bellows which combine flexibility and high medium temperature with simple installation.

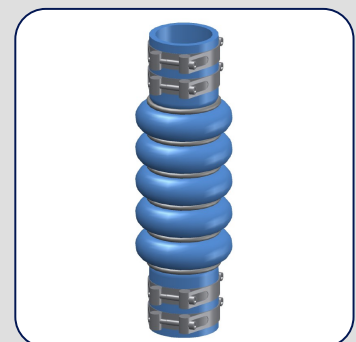
The 4K ranges accommodate misalignment, axial and lateral pipework movements and reduce the transmission of noise, vibration and shock.

The bellows are manufactured in blue synthetic rubber, with a black rubber liner, reinforced with synthetic fabric to achieve a high mechanical strength. They are suitable for use with cooling water and air pipework systems up to 170°C.

The burst pressure safety factor is 3 times the working pressure of 4 bar. The minimum work-pressure (absolute) is 80 to 90 kPa, depending on bellow size and can be lowered by fitting vacuum support rings.



EXAMPLE



4K POLYESTER
SILICONE



4K WRAS SILICONE

General WRAS

A specially developed silicone material, which is used as a liner in hoses that will carry drinking water.

This rubber compound retains all the desirable properties of silicone elastomers in terms of temperature range and durability but in addition is non-tainting, toxicologically inert and will not support bacterial growth.

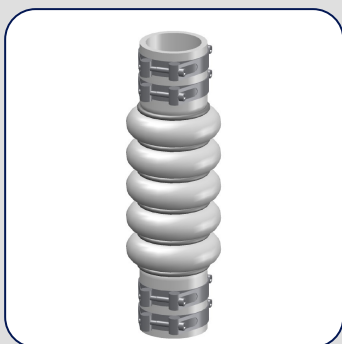
This material is recognized by the Water Regulations Advisory Scheme (WRAS) and carries their certificate number 0412511.

This material can be incorporated into standard silicone hoses or for more demanding applications. For instance in the Rail Transport sector, a flame retardant - low smoke low toxicity outer may be used.

As an addition to the 3K range, the 4K multiple bellows with support rings have been designed especially to provide small, low weight bellows which combine flexibility and high medium temperature with simple installation.

The 4K ranges accommodate misalignment, axial and lateral pipework movements and reduce the transmission of noise, vibration and shock.

The bellows are manufactured in white synthetic rubber, reinforced with synthetic fabric to achieve a high mechanical strength. They are suitable for use with drinking water. The burst pressure safety factor is 3 times the working pressure of 4 bar. The minimum workpressure (absolute) is 80 to 90 kPa, depending on bellow size and can be lowered by fitting vacuum support rings.



EXAMPLE