Pipeline Products for all Industries

Product Information

HOSE & CONNECTORS
Technical Appendix

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Guide to Icons

HYDRAULIC APPLICATIONS

- Agricultural Hydraulics
- Agricultural Sprayer
- Anti Spatter
- Articulating Booms
- Automotive Roof Opening Systems
- Bicycle Disk Brakes
- Boat Steering
- Bolt Tensioning
- Cabin Lift
- Car Transporter
- Low Temperature Environments
- Machine Tools
- Marine Hydraulics
- Mining
- Off-Shore Applications
- Off-Shore ROVs
- Power Chains
- Pressure Test Equipment
- Rescue Tooling
- Cherry Pickers
- Deck Cranes
- Earth Moving Equipment
- Forklift
- High Pressure Industrial Gases
- High Tension Wind Generation
- Hose Reels
- Jacking Applications
- Loader Cranes
- Self-Extinguishing Flame Retardant
- Servo Controls
- Spark Safe
- Telehandlings
- Tower Cranes
- Truck Platform
- Umbilicals
- Yacht Hydraulic Systems
- Scissor Lifts

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INDUSTRIAL APPLICATIONS

- Air Cylinder Filling
- Air-less Paint Spray
- Beverage Dispensing
- Corrugated Hose Bunch Protector
- Corrugated Hose Protector
- Fire Extinguishing
- Low Temperature Environments
- Professional Power Washer
- PU Foam
- Sewer Cleaning
- Shock Resistant
- Steam
- Greasing Applications
- High Pressure Industrial Gases
- High Temperatures
- Hobby Power Washer
- Hose Reels
- Solvents & Aggressive Chemicals
- Water Delivery
- Water Jetting Trailers
- Water Jetting
- Weather and U.V. Resistant

TECHNICAL DATA

- SAP Article Code
- Manufacturers Article Code
- Flange Size
- Weight
- Thread
- Tube Size
- O.D. (Specified Wire or Cover)
- Burst Pressure
- Working Pressure
- I.D.
- Dimensions
- Bend Radius
- Thickness

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Operating Conditions

STORAGE OF HOSE AND HOSE ASSEMBLIES

Even under appropriate storage conditions and acceptable operating conditions hose and assemblies are subject to a natural ageing. Therefore the shelf life and service life is limited.

The storage conditions of rubber articles in general are described in detail in DIN 7716, DIN 20066 as well as in various other publications. *(Please contact your account manager for more details)*

Pertinent details regarding storage conditions extracted from DIN 7716 are:

The storage room should be cool, dry, with little dust and well ventilated

The storage temperature should be between -10°C and +15°C (max +25°C)

The stored material should be protected against sources of heat (direct heating)

The relative humidity of the air should not exceed 65%

Direct exposure to sunlight or artificial light with high UV radiation should be avoided

The influence of ozone is especially prejudicial. In the storage rooms no ozone-producing installations such as electrical engines, welding machines etc. must be operated

No solvents, fuels, lubricants, chemical products, disinfectants etc. must be stored in the same storage room as any hose.

Stockpiling hose over recommended heights should be avoided because the weight could damage the hose below. A recommended height of approximately 1.5m should be a maximum, but this depends on the dimension, construction and therefore weight of the hose.

Experience shows that damage caused by insects or rodents should not be under-estimated.

SERVICE LIFE OF HOSE AND HOSE ASSEMBLIES

In every day use hydraulic hose and assemblies are exposed to a series of stresses which makes it impossible to make a general statement about the service life of hose.

Standards and publications compiled by professional associations give directives for the service life of hydraulic hose:

Recommendations of DIN 20066

At the time of mounting (assembly of couplings) the hose should not be older than four years.

The working life of the hose should not exceed six years including a possible storage of a maximum of 2 years. However in determined areas of application the service life can be varied according to data of experience and specially considering the particular conditions of operation. Any data differing from the norms have to be indicated in the instructions of use.

British Standards BS 5244

Gives a much more detailed recommendation:

Test recommendations for hose:

Age	Recommendations
Up to 3 years	Use without further testing
3 to 5 years	Use after representative samples subjected to a proof pressure test
5 to 8 years	Use after representative samples subjected to proof, impulse and burst pressure tests and cold bend and electrical tests
Over 8 years	Scrap

Test recommendations for hose assemblies:

Age	Recommendations
Up to 3 years	Use without further testing
3 to 5 years	Use only after subjecting each assembly to a pressure test of 1.5 x design working pressure and representative samples to a burst pressure test
5 to 8 years	As above plus impulse pressure test and cold bend and electrical test on representative samples
Over 8 years	Scrap

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INFLUENTIAL FACTORS ON SERVICE LIFE

If hose assemblies are exposed to operating conditions that pass the admissible tolerance a clear reduction of the products lifetime can be expected.

Experience shows that hydraulic assemblies are often over-stressed due to the following operating conditions:

Issue: Continuous exceeding of the admissible dynamic operating pressure
Effect: Cracking of wire braids due to fatigue, hose will burst

Issue: Exceeding of the indicated minimum bending radius
Effect: Over-stressing of wire construction and rubber material, clear reduction of impulse resistance

Issue: High exposure to sunlight (ozone, UV exposure), possibly combined with exceeding the minimum bending radius
Effect: Cracks in the hose cover, humidity will enter the wire layers, subsequent corrosion and bursting.

Issue: Continuous exceeding of working temperature resp. exceeding of indicated peak temperature
Effect: Ageing (hardening) and appearance of cracks in the hose liner, leakage and loosening of coupling

Issue: Simultaneous stresses within the admissible value limits
Effect: Constant operation with maximum operating pressure, maximum working temperature and minimum bending radius will also cause a limitation of the products service life

Hose that is already used as a component of an assembly should not be reused. The first application might have changed the characteristics of the material in such a way that a new one could mean increased risk.

BREAKDOWN OF HOSE ASSEMBLIES

Depending on their use hydraulic assemblies should be checked in defined periods to control their functionality and possible damage.

Together with the effects caused by over-stressing, failures of assemblies are due to the following:

Issue: Mechanical damage of the cover due to abrasion, cuts, squeezing and bending
Effect: Penetration of humidity into the wire layers, corrosion and bursting

Issue: Influence of heat due to exposure to exterior sources of high temperature
Effect: Ageing (hardening, drying) of the hose cover, cracks, corrosion and bursting

Issue: Inside overheating due to excessive flow velocity (frictional heat and turbulence)
Effect: Hardening, drying, partial scorching of the lining, corrosion and bursting

Note: The recommended flow velocity in hydraulic systems is between **3 and 6m/sec**.
In NO CASE should a flow velocity of **8m/sec** be exceeded!

Issue: Deforming of the hose: tearing, twisting and kinking
Effect: Deformation and over-stressing of the wire layers, bursting

Note: The construction of hydraulic hose is designed to resist the required pressure values BUT NOT to withstand tractive forces

Twisting a high pressure hose only 7° may reduce its service life up to 90%

Issue: Influence of aggressive media inadequate for the hose (inside and/or outside)
Extreme swelling or hardening of liner and cover, chemical destruction of the compound components, dissolution, corrosion, bursting

Note: Please follow the indications in the Table of Chemical Resistance

Issue: Damage, deformation or corrosion of the coupling Reduction of functionality and stress resistance

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MAKING THE RIGHT CHOICES

Hydraulic hose assemblies are used to transmit force by means of oil pressure and consist of flexible hydraulic hoses to which connectors are attached at either end to ensure safe, interlocking connections.

The correct choice of hose assembly components is influenced by many factors, in particular the dynamic working pressure, resistance to the media being transmitted and operating temperatures – both ambient and the media.

Follow the instructions

Often legal and other regulations need careful consideration where hydraulic hose assemblies are used, and the manufacturer should be informed about them when you make your enquiry. In some cases, observing the instructions for installation will determine the potential service life of a hydraulic hose assembly.

DETERMINING HOSE DIMENSIONS

The required inside diameter of a hose assembly is determined by the projected working pressure and the proposed rate of flow.

Never undersize hoses

Undersized hose assemblies result in a high flow rate of the medium. The ensuing turbulence causes considerable loss of pressure, noise and increased temperatures. This can be detrimental to the entire system.

If undersize valve connections suggest smaller hose diameters, we recommend the use of suitable adapters which then cause only local constrictions in the system.

DYNAMIC WORKING PRESSURE IS DECISIVE

In practice hydraulic hose assemblies are subjected to dynamic loading. A hose assembly must therefore be designed for operation at the maximum permissible working pressure specified for the respective hose type and size.

Safety factor 4:1

The working pressure of a hydraulic hose assembly is normally a quarter of the theoretical or specified bursting pressure. This safety factor of 4:1 conforms to SAE, DIN and EN-regulations.

Dynamic operating pressures...

is the most frequently operating condition in hydraulic systems. Pure static load is the absolute exception and therefore the Static Working Pressure has been eliminated from the standards.

Consider peak pressures

A hose with a higher pressure rating than the actual working pressure of the installation should be selected for systems in which sudden peak pressures occur.

CORRECT STORAGE EXTENDS SERVICE LIFE

The store room should be cool (up to +20°C) dry (rel. humidity max. 65%) and protected from sunlight. Exposure to ozone and UV radiation will shorten the service life of a hose.

The oldest hoses or assemblies in stock should always be used first.

For further details see DIN 7716.

MONITORING HIGH PRESSURE GAS SYSTEMS

High pressure gas systems are extremely dangerous and require extra care and regular inspection.

Hose assemblies used in gas systems have to be suitably protected against mechanical damage and chemical and environmental influences.

The hoses of such installations should also be connected in such a way that they cannot whip in the event of a defect occurring.

Perforation of outside cover

The outside cover of a hose assembly used for the conveyance of gaseous media must be perforated.

PRESSURE TESTING AS A SAFETY CHECK

Hose assemblies are statically tested by the manufacturer at suitable test pressures; neither leaks nor failure must occur.

TEMPERATURE AFFECTS SERVICE LIFE

The operating temperatures given for hoses are the maximum temperatures of the medium.

Ambient temperatures must also be taken into consideration (see below).

Continuous operation at high temperatures can adversely affect the service life of the hose and the reliable retention of end connector integrity.

Temperature resistance depends on medium

Hose assemblies cannot be used for any medium over the specified temperature range.

In case of doubt please ask!

Hoses assemblies will have a considerably longer service life if they are not continually used at the limits of their working pressure, bend radius, temperature of medium and environment.

ALLOW FOR CHANGES IN LENGTH

Every hose is subject to certain changes in length under working pressure.

The standards specify that these values can vary between +2% to +4% at maximum working pressure.

This change in length must be taken into consideration in each case when calculating the nominal length of a hose assembly with connectors.

OBSERVE THE MINIMUM BEND RADIUS

The specified minimum bend radius apply to stationary hose assemblies at maximum working pressure.

The service life of a hose assembly is impaired if bends of less than the recommended minimum bend radius are used. Working pressure should be reduced in such cases.

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Best Practice Advice

DAMAGED HOSES CAN CAUSE ACCIDENTS AND PERSONAL INJURY:

Damaged hydraulic hose assemblies always cause unexpected expense, however, they can also lead to severe accident and personal injury, even death. Many such accidents can be avoided if sufficient attention is paid to the early detection of damage.

Conditions for safe operation

- Choice of a suitable hose assembly for the required working pressure, conditions of operation and nominal diameter.
- Operating range in accordance with relevant standards or other regulations
- Professional installation, correct and careful routing
- Immediate replacement of visibly damaged hose assemblies

Main causes of damage

- Mechanical damage
- Too much bending
- Extreme tension
- Above-average twisting
- Severe compression
- Unsuitable medium

Possible consequences of damage

- Damage to outer cover down to steel wire reinforcement – may result in corrosion of wire reinforcement
- Deformation or embrittlement of outer cover
- Damage or deformation of hose fittings
- Possibility of bursting

Regular checks for early detection of damage

- Perfect condition of outer cover of hose – no cracks, bubbles, deformation, wear or kinking
- Proper attachment of fittings
- Proper routing – avoid extreme kinking, too much tension, violent twisting
- Check for leakage

Procedure for replacement of hoses

- Ensure there is no system flow/pressure
- Check suitability of replacement hose
- Install replacement hose
- Restore operating pressure
- Check for leaks

BURST PRESSURE MUST NEVER BE REACHED

The values specified for burst pressure are minimum values. They apply only to unused hose assemblies.

The burst pressure of a hose or a hose assembly must therefore remain a purely theoretical value for the user. In view of the safety requirements imposed on any installation, this value must never be reached – or even approached – in practice.

It is incorrect to assume that comparable hoses of different manufactures have longer service life under the same operating conditions the higher the rating for bursting pressure is. Designers should therefore take dynamic pressure values into consideration.

AS SOON AS A HOSE SHOWS ANY DAMAGE IT HAS TO BE REPLACED IMMEDIATELY

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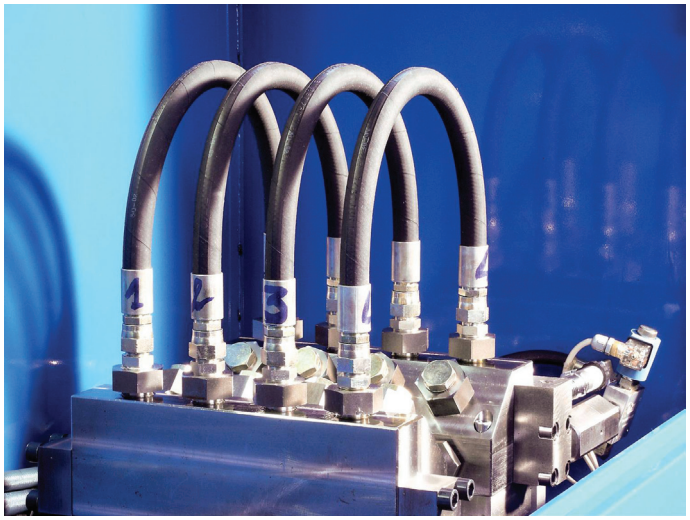
IMPULSE TEST TO MEASURE PERFORMANCE

The impulse test is the most severe test for a hose assembly, reproducing practical operating conditions very closely.

Our manufacturing quality assurance department therefore continually takes samples and subjects them to impulse test quality.

This test is carried out as follows: the hose assembly under test is given the minimum bend radius specified by the standard and subjected to an alternating load varying between a flushing pressure of approx. 10 bar and a pressure equal to 125% or 133% of its dynamic working pressure.



Testing up to 500.000 load cycles...

Depending on the type of hose, the sample is expected to withstand at least 150.000, 200.000 or 500.000 load cycles under these conditions.

Special designs such as 2 SN-K, SPC-2 and SPC-3 are further impulse tested up to 1 million cycles.

Full details of test methods and quality requirements, such as chemical and physical tests, media resistance, ageing characteristics, etc. can be found in the SAE J 343, EN 853 to 857 and ISO 1436 standards.

Application and customer specific dynamic and pressure testing

We also undertake a full range of customer specific pressure testing programmes to ensure fitness of purpose in all types of enhanced requirement applications.

This testing, up to 5,000 Bar, can be built in as part of the hose assembly manufacturing programme where this is undertaken at the Stauff Hose and Tube Technology Centre.

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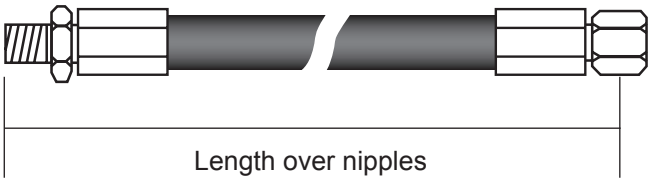
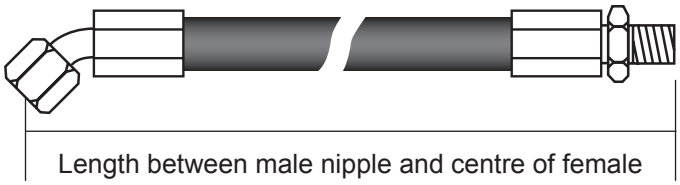
HOSE ASSEMBLY

Determining the overall length of the assembly to be produced.



Length over nipples



Length between male nipple and centre of female

Length between SP and nipple ends

Length between centre of flange and nipple end

Length between banjo and angle centre lines

Length between centre line of SP & female

TOLERANCES OF LENGTH OF HOSE ASSEMBLIES

Length	Tolerance		
	Up to and including 25	Over 25 and including 50	Over 50
Up to and including 630	+ 7mm - 3mm	+ 12mm - 4mm	+ 25mm - 6mm
Over 630 and including 1250	+ 12mm - 4mm	+ 20mm - 6mm	
Over 1250 and including 2500	+ 20mm - 6mm	+ 25mm - 6mm	
Over 2500 and including 8000	+ 1.5% - 0.5%		
Over 8000	+ 3% - 1%		

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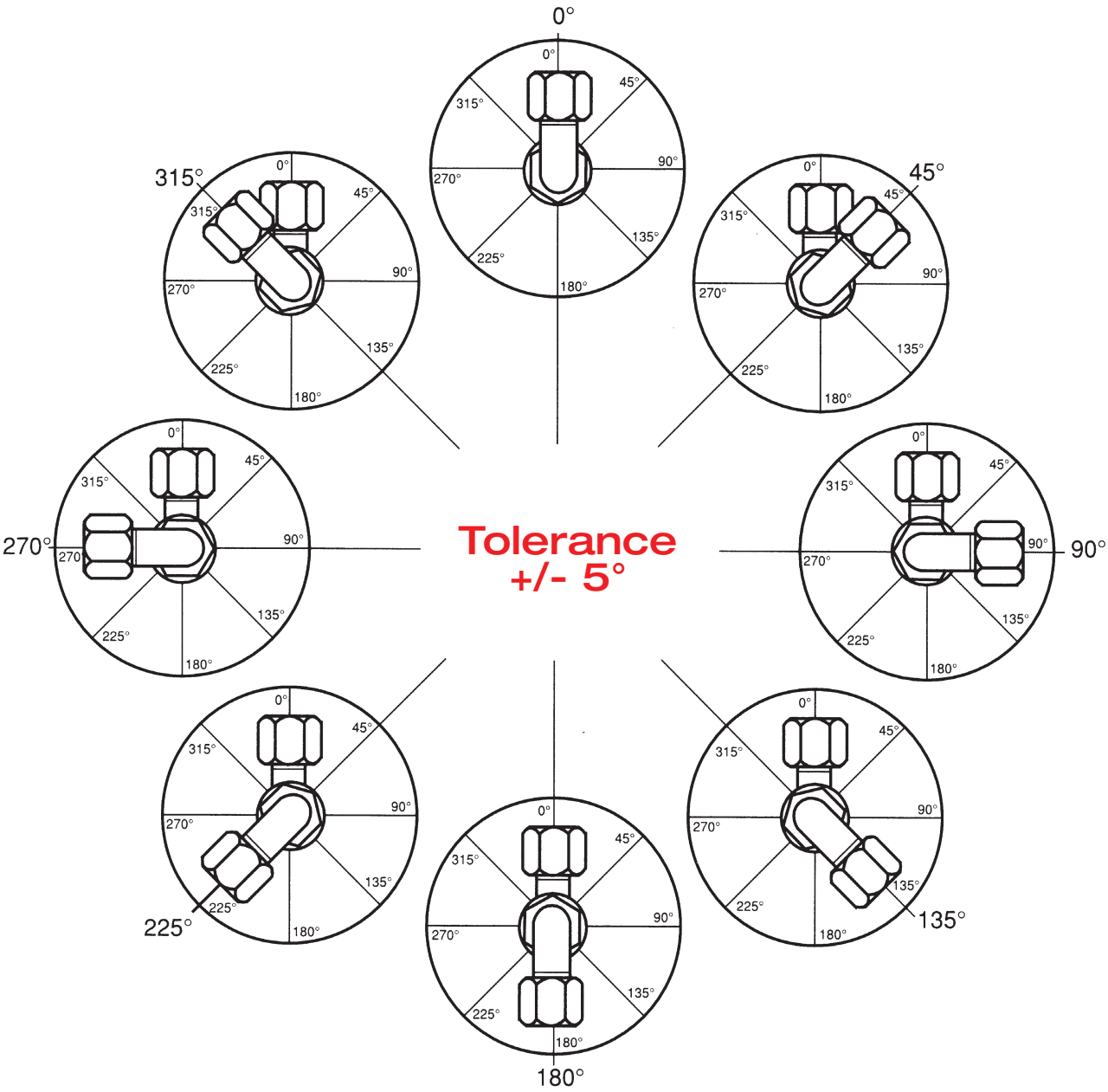
CALCULATING THE ANGLE SETTINGS

The angle settings of hose assemblies with elbow connectors at either end needs to be very carefully determined. Use the following instructions and illustration guidelines to ensure accurate measurement.

- Look along the hose assembly, with the rear connector away from the body and pointing upwards.
- Now specify how many degrees the front connector is rotated in a clockwise direction.
- Acceptable Tolerance +/- 5°.



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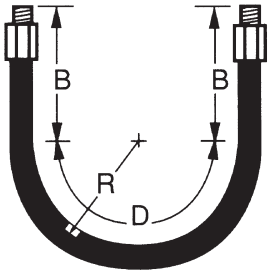
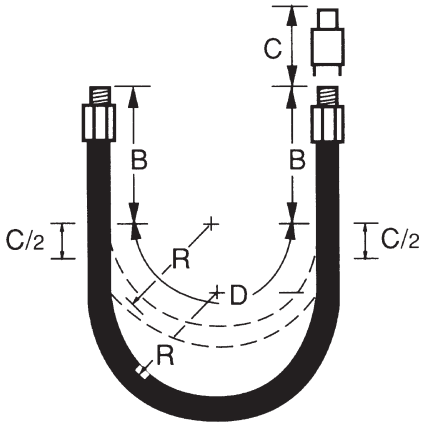
CALCULATING THE HOSE LENGTH

The service life of hose assemblies can be increased by proper measurement and installation.
Please follow the following instructions.



Overall length
L = 2B + 3.14R

R = Minimum bend radius



Overall length
L = 2B + 3.14R + C

Additional length C should be allowed for if vertical movement takes place

Depending on the hose diameter, the following table gives the minimum length B, that should be allowed for at the end of the connectors of a hose assembly.

DN Ø	6	8	10	12	16	20	25	32	40
B (mm)	90	100	110	120	130	140	160	180	200

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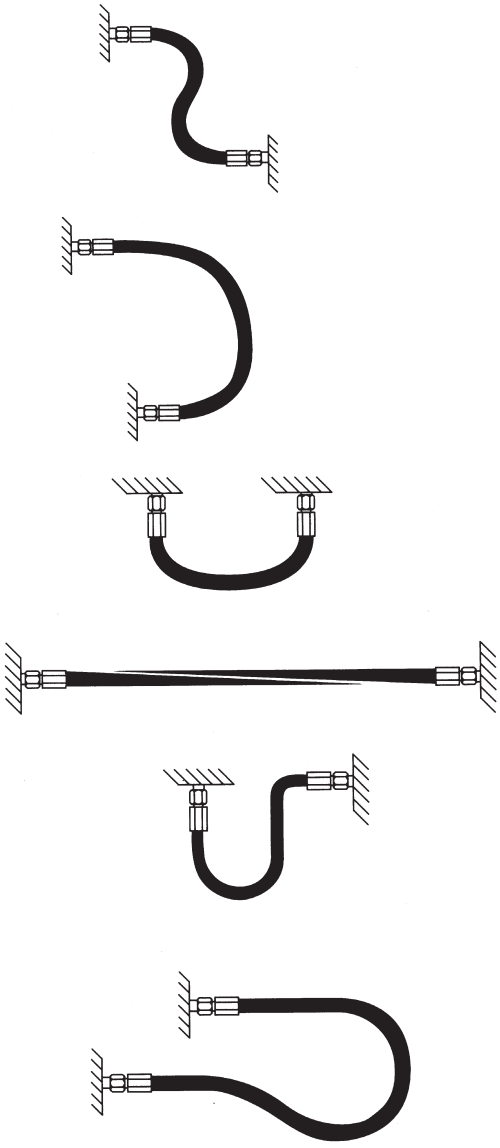
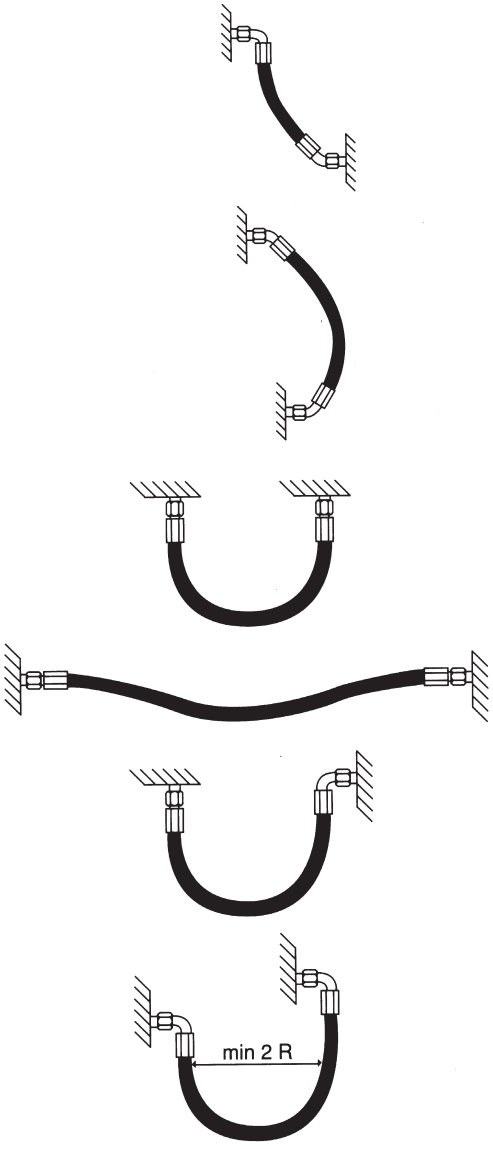
CORRECT INSTALLATION TECHNIQUES

- Under pressure, alterations of +2 % to +4 % can occur in the length of hose assemblies.
- Hoses should therefore be installed with slack or curves.
- Hose assemblies should never be installed twisted (no torsion).
- Hose assemblies should not be bent excessively – ***use elbow connectors instead***
- Note minimum bend radius.
- If vertical displacement occurs, allow for amount of travel.
- Protect from external damage (use protective spirals).

✗ Incorrect



✓ Correct



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Female Swivel Ends Torque Values - "CP-CX" Series

SWIVEL END THREAD		DASH SIZE		NUT EXAGON mm	TORQUE VALUE (Nm)	
					Nominal	Min. - Max.
DKR	1/8"-28	02	FGP	14	15	
DKR / DKOR	1/4"-19	04	FGP-FGL-FGOL	19	20	15 - 25
DKR / DKOR	3/8"-19	06	FGP-FGL-FGOL	22	34	27 - 41
DKR / DKOR	1/2"-14	08	FGP-FGL-FGOL	27	60	42 - 76
DKR / DKOR	5/8"-14	10	FGP-FGS-FGOS	30	69	44 - 94
DKR / DKOR	3/4"-14	12	FGP-FGS-FGOS	32	115	95 - 135
DKR / DKOR	1"-11	16	FGP-FGS-FGOS	41	140	115 - 165
DKR / DKOR	1 1/4"-11	20	FGP-FGOS	50	210	140 - 280
DKR / DKOR	1 1/2"-11	24	FGP-FGOS	55	290	215 - 365
DKR / DKOR	2"-11	32	FGP-FGOS	70	400	300 - 500
DKJ	7/16"-20	04	FI	15	15	9 - 21
DKJ	1/2"-20	05	FI	17	20	13 - 27
DKJ	9/16"-18	06	FI	19	30	18 - 42
DKJ	3/4"-16	08	FI	24	50	30 - 70
DKJ	7/8"-14	10	FI	27	69	44 - 94
DKJ	1 1/16"-12	12	FI-FIS	32	98	63 - 133
DKJ	1 3/16"-12	14	FI-FIS	36	118	73 - 163
DKJ	1 5/16"-12	16	FI-FIS	41	140	90 - 190
DKJ	1 5/8"-12	20	FI-FIS	50	210	135 - 285
DKJ	1 7/8"-12	24	FI-FIS	55	290	215 - 365
DKJ	2 1/2"-12	32	FI-FIS	70	400	300 - 500
ORFS	9/16"-18	04	FRS	17	14	16
ORFS	11/16"-16	06	FRS	22	24	27
ORFS	13/16"-16	08	FRS	24	43	47
ORFS	1"-14	10	FRS	30	60	68

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					Nominal	Min. - Max.
ORFS	1 3/16"-12	12	FRS	36	90	95
ORFS	1 7/16"-12	16	FRS	40	125	135
ORFS	1 11/16"-12	20	FRS	50	170	190
ORFS	2"-12	24	FRS	60	200	225
DKOL	M12x1,5	6L	FOS	14	20	15 - 25
DKOL / DKL	M14x1,5	8L	FOS / FM	17	38	30 - 45
DKOL / DKL	M16x1,5	10L	FOS / FM	19	45	38 - 52
DKOL / DKL	M18x1,5	12L	FOS / FM	22	51	43 - 58
DKOL / DKL	M22x1,5	15L	FOS / FM	27	74	60 - 88
DKOL / DKL	M26x1,5	18L	FOS / FM	32	105	85 - 125
DKOL	M30x2	22L	FOS	36	135	115 - 155
DKOL	M36x2	28L	FOS	41	166	140 - 192
DKOL	M45x2	35L	FOS	50	290	255 - 325
DKOL	M52x2	42L	FOS	60	330	280 - 380
DKOS	M14x1,5	6S	FOS	17	38	30 - 45
DKOS	M16x1,5	8S	FOS	19	45	38 - 52
DKOS	M18x1,5	10S	FOS	22	51	43 - 58
DKOS	M20x1,5	12S	FOS	24	58	50 - 65
DKOS	M22x1,5	14S	FOS	27	74	60 - 88
DKOS	M24x1,5	16S	FOS	30	74	60 - 88
DKOS	M30x2	20S	FOS	36	135	115 - 155
DKOS	M36x2	25S	FOS	46	166	140 - 192
DKOS	M42x2	30S	FOS	50	240	210 - 270
DKOS	M52x2	38S	FOS	60	330	280 - 380

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Fluid Compatibility

Fluid	Hoses type			
	DS1-A/DS1-T/DS2-A DS2-T DS1-SC/DS2-SC/FORTIUS FORTIUS 2/DS5/DS17/DS4 DS6/DS3/DS-1TE/DS-2TE DS-3TE/MASTER/OVERMASTER BIOFOREST/DS2-SC OZON RESISTANT/FAHRENHEIT 302/1/ FAHRENHEIT 302/2 FAHRENHEIT 302/16 FAHRENHEIT 302/5/HARC 2 HARC 2K/ENDLESS 1 ENDLESS 2/ICE-FLEX 2 ICE-FLEX 3/LEAN LINE	DS-4SP /DS-4SH/DS9-AT DS12/DS13/DS15/HARC SP HARC SH/ENDLESS SP ENDLESS SH/WATERBLAST	HOT WATER 210 COMPACT HOT WATER 210 THIN COVER/HOT WATER 250 HOT WATER 315 HOT WATER 400 COMPACT HOT WATER 400 THIN COVER/HOT WATER 500	DS7/DS8
ACETIC ACID	-	-	-	A
ACETIC ACID (30%)	B	B	B	A
ACETONE	C	C	C	A
ACETYLENE	A	A	A	A
AMMONIA,GAS (HOT)	B	B	B	
AMMONIA,LIQUID	A	A	A	A
AMMONIUMCHLORIDE	-	-	-	C
AMYL ACETATE	C	C	C	-
ANILINE	C	C	C	B
ANIMAL OILS	A	A	A	A
BENZOL/BENZENE	C	C	C	A
BUTANE	B	B	B	A
BUTYL ACETATE	C	C	C	-
BUTYL ALCOHOL/BUTANOL	A	A	A	-
CALCIUM CHLORIDE SOLUTIONS	-	-	-	A
CARBON DIOXIDE	A	A	A	-
CARBON DISULFIDE	C	C	C	-
CARBONATES	B	B	B	-
CAUSTIC SODA	A	A	A	-
CHLORINATED SOLVENTS	C	C	C	-
CHLORINE	C	C	C	C
CHLOROFORM	C	C	C	C
CITRIC ACID SOLUTIONS	A	A	A	A
COMPRESSED AIR	A	A	A	A
CYCLOHEXANE	B	B	B	A
CRUDE PETROLEUM OIL	A	B	B	A
DIOCTYL PHTHALATE	-	-	-	A
DISEL FUEL	A	B	B	A
ETHERS	B	B	B	-
ETHYL ACETATE	C	C	C	-
ETHYL ALCOHOL	A	A	A	B
ETHYL CELLULOSE	A	A	A	-
ETHYL CHLORIDE	C	C	C	-
ETHYLENE GLYCOL	A	A	A	A
ETHYLENEOXIDE	C	C	C	A
FLUORINE	C	C	C	C
FORMALDEHYDE	A	A	A	-
FORMALDEHYDE 40%	A	A	A	B
FUEL OIL	A	A	B	-
GASEOUS HYDROGEN	B	B	B	A
GASOLINE	A	B	A	A
GLYCERIN/GLYCEROL	A	A	A	A
GLYCOL TO 66°C	A	A	A	A
HEXANE	A	A	A	A
HYDRAULIC OIL	A	A	C	-
HYDROCHLORIC ACID 37%	C	C	C	C

A - It corresponds to an excellent chemical resistance, with minimum or no properties changement
B - It corresponds to a limited chemical resistance, with moderately acceptable properties changements
C - It corresponds to an inadequate behaviour, with drastic collapse of all the characteristics

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Fluid Compatibility

Fluid	Hoses type			
	DS1-A/DS1-T/DS2-A DS2-T DS1-SC/DS2-SC/FORTIUS FORTIUS 2/DS5/DS17/DS4 DS6/DS3/DS-1TE/DS-2TE DS-3TE/MASTER/OVERMASTER BIOFOREST/DS2-SC OZON RESISTANT/FAHRENHEIT 302/1/ FAHRENHEIT 302/2 FAHRENHEIT 302/16 FAHRENHEIT 302/5/HARC 2 HARC 2K/ENDLESS 1 ENDLESS 2/ICE-FLEX 2 ICE-FLEX 3/LEAN LINE	DS-4SP /DS-4SH/DS9-AT DS12/DS13/DS15/HARC SP HARC SH/ENDLESS SP ENDLESS SH/WATERBLAST	HOT WATER 210 COMPACT HOT WATER 210 THIN COVER/HOT WATER 250 HOT WATER 315 HOT WATER 400 COMPACT HOT WATER 400 THIN COVER/HOT WATER 500	DS7/DS8
HYDROGER PEROXIDE (DIL).1	A	A	A	-
HYDROGER PEROXIDE (CONC.)	B	B	B	-
IRUS 902 (Hydraulic fluid water-oil emulsion)	A	A	A	A
ISOCYANATES	-	-	-	B
ISOPROPIL AICOHOL	A	A	A	-
KEROSENE	A	A	A	A
LIQUID OXYGEN	C	C	C	-
LPG	B	B	B	-
LUBRIFICATING OILS	A	A	A	A
MERCURY	A	A	A	A
METHYL ALCOHOL/METHANOL	A	A	A	B
METHYL CHLORIDE (COLD)	C	C	C	A
METHYL ETHYL KHETONE	C	C	C	A
MINERAL OILS	A	A	A	A
NAPHTHA	A	A	A	A
NAPHTHAIENE	C	C	C	A
NATURAL GAS	A	A	A	-
NITRIC ACID (DIL.)	C	C	C	C
NITRIC ACID (CONC.)	C	C	C	C
NITROBENZEN	C	C	C	A
OIL OF TURPENTINE	A	C	A	A
OLEIC ACID	C	C	C	A
OXAUCACID	C	C	C	-
PERCHLOROETHYIENE	C	C	C	B
PHENOL	C	C	C	C
PHOSPHORIC ACID (10%)	A	A	A	-
PHOSPHORIC ACID (70%)	C	C	C	-
PHOSPHATE ESTER BASE OIL	C	C	C	-
SATURATED STEAM	C	C	C	-
SEA WATER	A	A	A	A
SILICONE OILS	A	A	A	-
SOAP SOLUTIONS	B	B	B	A
SODA	A	A	A	A
SODIUM CHLORIDE SOLUTIONS	A	A	A	A
SODIUM HYDROXIDE 20%	B	A	B	-
SODIUM HYPOCHLOIRYDE 10%	B	B	B	-
SULPHUR	A	A	A	A
SULPHUR DIOXIDE	C	C	C	-
SULPHURIC ACID UP TO 50%	C	C	C	A
SULPHURIC ACID ABOVE 50%	C	C	C	B
TOLUENE	C	C	C	A
TRICHLOROETHYIENE	C	C	C	B
VEGETABLE GREASES	A	A	A	-
WATER	A	A	A	A
XYLENE	C	C	C	A

This chart is intended as a guide only and is not a guarantee. Final selection of the proper material or component is further dependent on many factors including pressure, fluid, ambient temperature, concentration, duration of exposure, etc.

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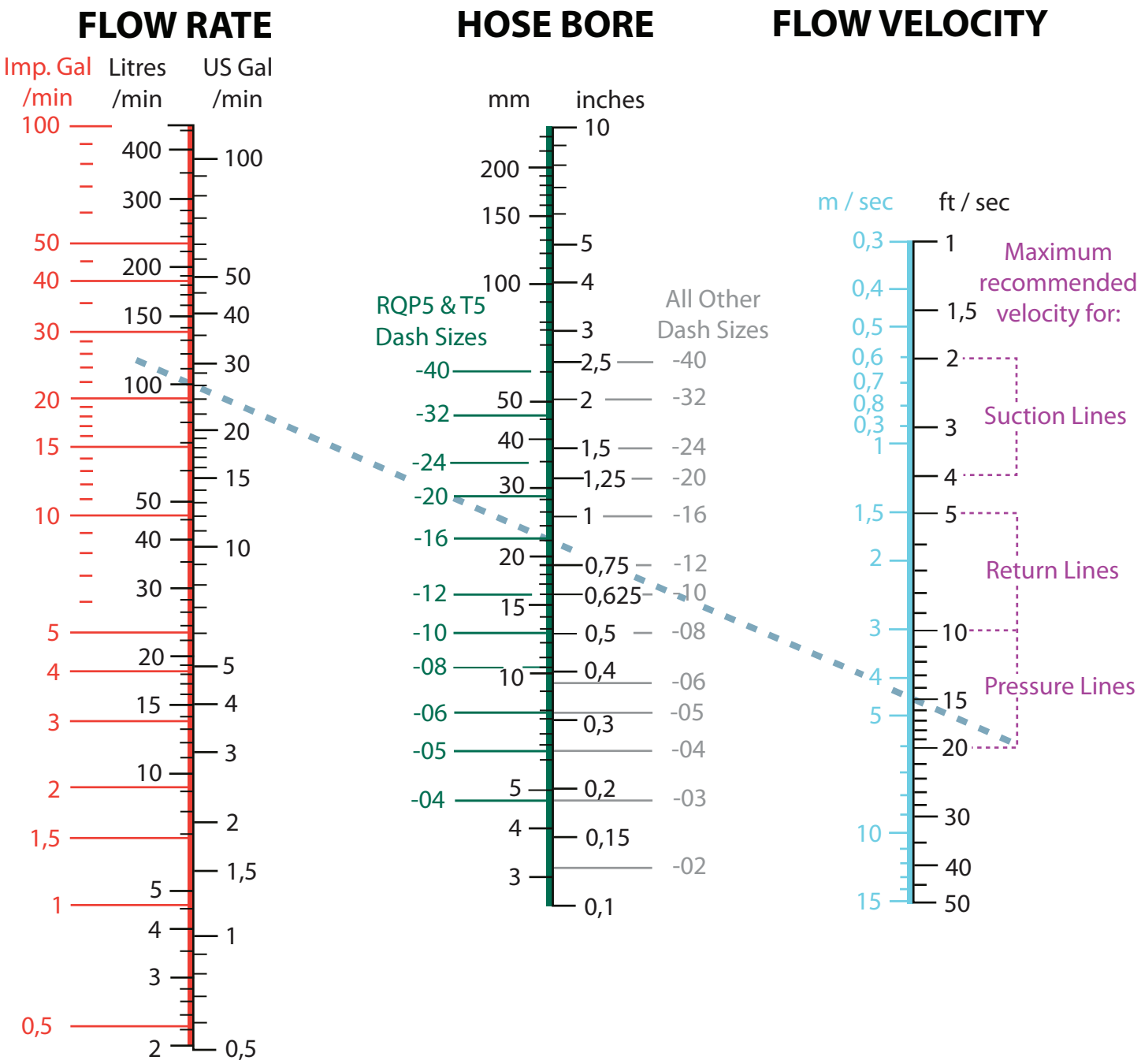
Nomograph

The correct size of a hose ID, required flow rate and recommended flow velocity can be selected using this nomograph. With knowledge of any 2 of these factors the third can be calculated.

Using this nomograph:
1. Pick the two known values
2. Lay a straightedge to instersect the two values
3. Intersection on the third vertical line give the value of that factor



The velocity of the fluid shold not exceed the range shown in the right hand column. When oil velocities are higher than recommended in the chart, turbulent flow occurs, resulting in loss of pressure and excessive heating. For long hoses and/or high viscosity oil, or if the flow of hydraulic fluid is continuous, it is recommended to use figures at the lower end of the Maximum Recommended Velocity range. For short hoses and/or low viscosity oil, or if the flow of hydraulic fluid is intermittent or for only short periods of time, figures a the higher end of the Maximum Recommended Velocity range can be used.

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DN	MM	5	6	8	10	12	16	19	25	31	38	51
	INCH	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	1.1/4	1.1/2	2
	DASH	-3	-4	-5	-6	-8	-10	-12	-16	-20	-24	-32
HOSE TYPE / WORKING PRESSURES	PILOT		125	125	125	125						
	SAE 100 R 1 AT		192	175	157	140	105	87	70	43	35	26
	EN 853, 1SN, 1SN EHT, SAE 100, R1S	250	225	215	180	160	130	105	88	63	50	40
	EN 857, 1SC		225	215	180	160	130	105	88			
	STAUFF*PAC* 1 SN-K		290	250	230	200	150	125	110	100		
	AGRO FLEX		210	210	210	210						
	SAE 100 R17		210	210	210	210	210	210	210	210		
	SAE 100 R 2 AT		350	297	280	245	192	157	140	113	87	78
	SAE 100 R 16		350	297	280	245	192	157	140			
	EN 853 2 SN, 2 SN EHT SAE 100 R 2S	415	400	350	330	275	250	215	165	125	90	80
	EN 857 2SC		400	350	330	275	250	215	165			
	STAUFF*SHIELD* SSC		400	375	350	300	275	235	185			
	STAUFF*PAC* 2 SNK		450	420	385	345	290	280	200			
	SUPERPAC SPC 2				425	380	350	280	230			
	SUPERPAC SPC 3				500	470	410	375	310			
	SAE 100 R 4							21	17	14	10	7
	EN 856 4SP				445	425	350	350	320	210	185	165
	STAUFF*SHIELD* SSP				445	425	350	350	320			
	EN856 4 SH STAUFF*SHIELD* SSH							420	380	345	290	250
	EN 856 SAE 100 R 12				280	280	280	280	280	210	175	175
	EN 856 SAE 100 R 13							350	350	350	350	350
	SAE 100 R 15							420	420	420	420	
	FLEXLINE 4000				280	280	280	280	280			
	STAUFF JET											
	1 SN		250	220	220	220						
	150		150									
	210		210									
	250		250	250	250	250						
	280				280							
	315			315								
	2 SN		400	400	400	400						
	2 SC		400	400	400	400						
	LONGLIFE		500	500	500	500						

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HIGH ABRASION RESISTANT HOSES

Stauff High Abrasion Resistant Hose has been developed and updated over existing proven products for even better performance in the most demanding environment appliications.

They rely on the use of highly developed formulae for hose cover construction and can be applied to all of the standard wire braid and wire spiral manufactured products.

STAUFF*Roc*

benefits from excellent ozone, UV, high temperature and salt water resistance. In addition this high specification product meets the demanding requirements of the underground coal mining industry.

Construction:

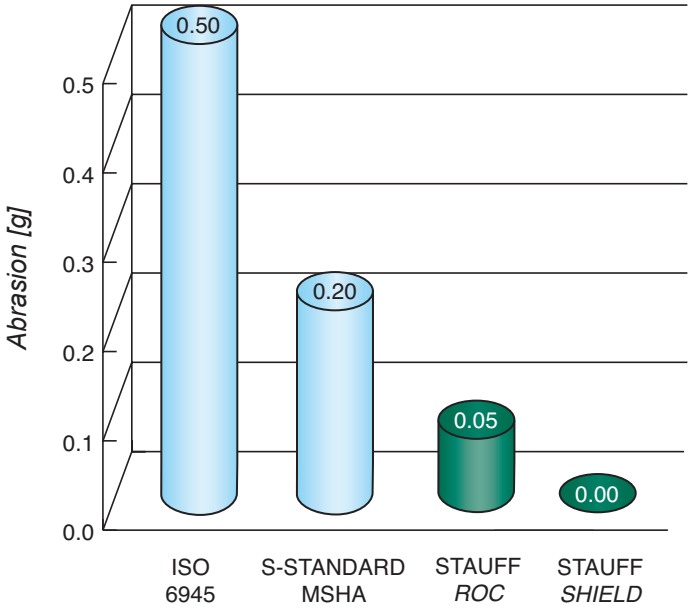
Tube:	Oil resistant synthetic rubber
Reinforcement:	One, two or four high tensile steel wire layers
Cover:	Synthetic rubber cover Super abrasion restance - graphic Excellent ozone and UV resistant Weather and salt water resistant Flame resistant acc. to MSHA and DSK [LOBA] specs Antistatic Temperature range -40°C to +100°C up to 120°C [for max. 30% of the application].

STAUFF*Shield*

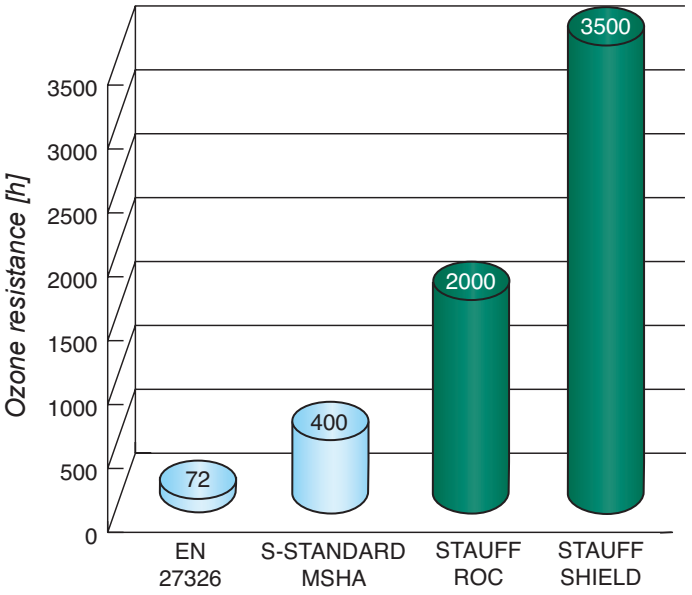
hose is known for its excellent wear and ozone resistance. This is achieved by a double layer construction with rubber cover and UHMW foil.

Testing to one million cycles, in accordance with EN ISO 6945, shows no measurable abrasion.

Abrasion values according to EN ISO 6945



Ozone resistance according to EN 27326



The following hose types can be supplied with STAUFFRoc or STAUFFShield cover specification:
1SN, 2SN, 2ST, 1SC, 2SC, R16, R17, 1SN-K, 2SN-K, SPC 2, SPC 3, 4SP, 4 SH, R12 BLACK

SEE PRODUCT DETAILS ON PAGES 51 to 54