www.hishose.com.au

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INDUSTRIAL CATALOGUE

H.I.S. HOSE
Proprietary Limited

PLASTIC TUBING & RECOIL HOSE

Certified System™
Quality
ISO 9001
SAI GLOBAL
CERT NO QEC22270

Industrial • Hydraulics • Ducting • Pneumatics

WESTERN BRANCH
28 Spencer Street
Sunshine West Vic 3020
Tel: (03) 8311 7400
Fax: (03) 9311 2322

EASTERN BRANCH
73-81 Bessemer Drive
Dandenong South Vic 3175
Tel: (03) 9794 9299
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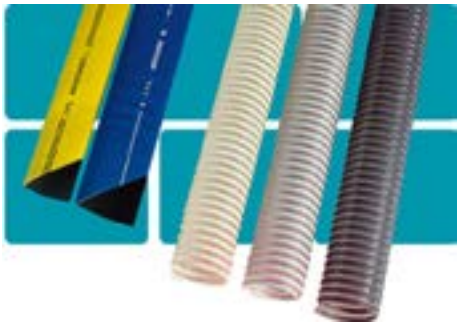
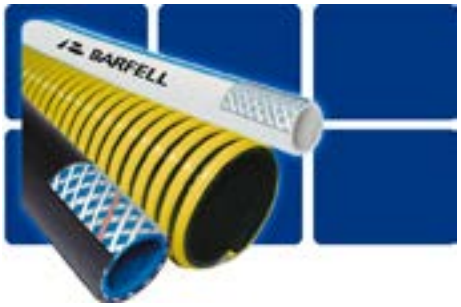
NORTHERN BRANCH
169-171 Northbourne Rd
Campbellfield Vic 3061
Tel: (03) 9305 4600
Fax: (03) 9305 4231

Other Catalogues Available:



- *IPL Plastic Hose*



- *Barfell Plastic Hoses & Tubes*

- *Industrial Rubber Hose*

- *Automotive*

- *Flexible Ducting*

- *Hose Clamps & Clips*

REF: 60-0107

Contents:

NYLON TUBING

BLUE BRAND FLEXIBLE TUBING

YELLOW BRAND HIGH PRESSURE/ HEAVY WALL TUBING

ORANGE BRAND LOW PRESSURE PIPE & TUBING

A NEW ADVANCE IN NYLON TUBING

H.I.S. Hose are stockists of a completely new super-flexible long life nylon tubing range suitable for medium pressure pneumatic and low pressure hydraulic use. Formulated to meet the demand for greater flexibility, it is light in weight with good resistance to brittleness. The life expectancy of the new super-flexible range is increased considerably through retention of flexibility. Available in imperial and metric sizes.

NYLON TUBING APPLICATIONS

- Automotive Grease and Air Lines
- Instrumentation Lines
- Beverage Lines
- Irrigation Control Systems
- Coolant Lines for Air Conditioning & Refrigeration
- Laboratory, Pharmaceutical and Chemical Application
- Food Processing Lines
- Low Pressure Hydraulic Lines
- Fuel and Oil Lines
- Lubrication Lines
- Gas Analysis
- Marine Drive and Steering Controls
- Industrial Robots
- Robotics

ADVANTAGES OVER CONVENTIONAL TUBING

- Extremely high pressure rating
- Resists crushing, abrasion and wear
- Added flexibility for difficult installations
- Wide temperature range (-40°C to + 120°C)
- Maximum resistance to flex and vibration fatigue
- Low cost compared to other flexible tubing with comparable burst pressure
- Tasteless, odourless and non-toxic
- Resistance to alkalis, oils, solvents and hydraulic fluids
- Heat and light stabilised as standard

HIGH PERFORMANCE

Nylon Tubing is specially developed to ensure simplicity of assembly and reliable connection with recommended fittings and adaptors.

FLEXIBILITY

Nylon Tubing is made from durable high performance nylon material. It is more flexible than other types of tubing, easier to handle and install around tight corners and limited access areas.

EXTENDED SERVICE

Nylon Tubing will remain flexible under most service conditions for long periods without showing fatigue from flexing and vibration stresses. Has excellent abrasion resisting characteristics and will not deteriorate whilst transferring most fluids.

CHEMICAL RESISTANCE

See Chemical Compatibility Guide in Technical Information Section

Nylon Tubing provides good resistance to chemicals, oils, fuels and most solvents and is suitable for a wide range of applications.

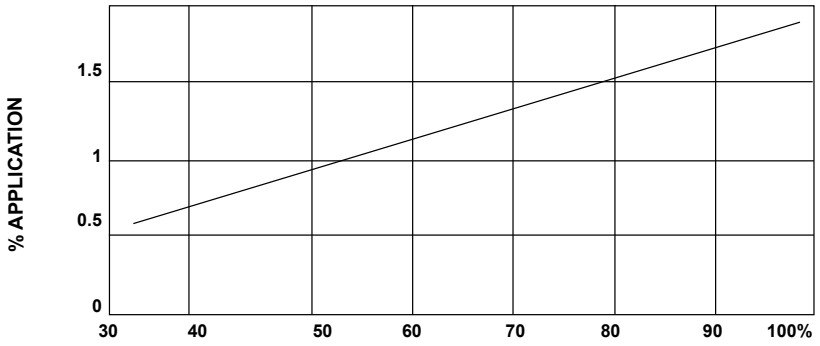
TEMPERATURE RANGE

Nylon Tubing is not affected by climatic conditions and remains flexible over an extensive range of temperatures (-40°C to + 120°C).

MOISTURE REGAIN

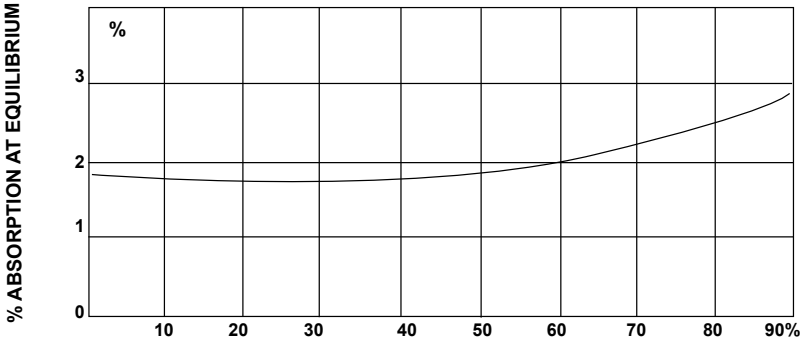
The Nylon material used is noted for its low water absorption (1.9% max.). Therefore it is possible to offer a tubing having excellent dimensional stability under varying conditions of humidity. Nylon Tubing retains its insulating properties whilst immersed in water.

WATER ABSORPTION AS A FUNCTION OF RELATIVE HUMIDITY



RELATIVE HUMIDITY

WATER ABSORPTION AS A FUNCTION OF TEMPERATURE (Total immersion)



PLEASE NOTE ALSO AVAILABLE:

BULK MERCHANDISING SPOOLS

Nylon tubing available on 250m and 500m spools. These lengths are available for metric and imperial sizes in Flexible and High Pressure Grades.

REF: 60-1107

BLUE BRAND FLEXIBLE RANGE

APPLICATION: MEDIUM PRESSURE - HEAT, LIGHT & CHEMICAL RESISTANT

Colours: Natural, black, blue, green, red & yellow.

IMPERIAL

Product No.	OD	ID	Wall Thickness	RWP PSI	RWP Bar	Min. Burst PSI	Min. Burst Bar	Kg 100m	Min. Bend Radius
NT1/8N	*1/8*	*0.087*	*0.019*	*250*	*17.2*	*1000*	*69*	*0.60*	*3/4*
NT3/16N	*3/16*	*0.125*	*0.031*	*250*	*17.2*	*1000*	*69*	*1.00*	*1*
NT1/4N	*1/4*	*0.169*	*0.040*	*250*	*17.2*	*1000*	*69*	*1.80*	*1.1/2*
NT5/16N	*5/16*	*0.214*	*0.049*	*250*	*17.2*	*1000*	*69*	*2.80*	*2*
NT3/8N	*3/8*	*0.258*	*0.058*	*250*	*17.2*	*1000*	*69*	*3.90*	*2.1/2*
NT1/2N	*1/2*	*0.347*	*0.076*	*250*	*17.2*	*1000*	*69*	*6.90*	*3.1/2*

METRIC

NT04N	*4*	*2.7*	*0.65*	*290*	*20*	*1160*	*80*	*0.72*	*28*
NT05N	*5*	*3.3*	*0.85*	*290*	*20*	*1160*	*80*	*1.16*	*35*
NT06N	*6*	*4.0*	*1.00*	*290*	*20*	*1160*	*80*	*1.60*	*42*
NT08N	*8*	*5.2*	*1.40*	*290*	*20*	*1160*	*80*	*3.00*	*56*
NT10N	*10*	*6.6*	*1.70*	*290*	*20*	*1160*	*80*	*4.60*	*70*
NT12N	*12*	*8.0*	*2.00*	*290*	*20*	*1160*	*80*	*6.60*	*84*

Note: *All Product Nos. shown are for Natural - for colours substitute following for last letter. BK=Black, B=Blue, G=Green, R=Red, Y=Yellow.*

YELLOW BRAND HIGH PRESSURE/HEAVY WALL

APPLICATION: HIGH PRESSURE - HEAT, LIGHT & CHEMICAL RESISTANT

Colours: Natural, black

IMPERIAL

Product No.	OD	ID	Wall Thickness	RWP PSI	RWP Bar	Min. Burst PSI	Min. Burst Bar	Kg 100m	Min. Bend Radius
NTHP1/8N	*1/8*	*0.078*	*0.023*	*625*	*43*	*2500*	*172*	*0.50*	*3/4*
NTHP3/16N	*3/16*	*0.110*	*0.038*	*625*	*43*	*2500*	*172*	*1.30*	*1.1/4*
NTHP1/4N	*1/4*	*0.147*	*0.050*	*625*	*43*	*2500*	*172*	*2.20*	*1.3/4*
NTHP5/16N	*5/16*	*0.186*	*0.062*	*625*	*43*	*2500*	*172*	*3.30*	*2.1/4*
NTHP3/8N	*3/8*	*0.224*	*0.074*	*625*	*43*	*2500*	*172*	*4.80*	*3*
NTHP1/2N	*1/2*	*0.303*	*0.097*	*625*	*43*	*2500*	*172*	*8.40*	*4*

Note: All Product Nos. shown are for Natural - for black substitute BK.

ORANGE BRAND LOW PRESSURE TUBING

APPLICATION: HIGH PRESSURE - HEAT, LIGHT & CHEMICAL RESISTANT

Colours: Natural, black

IMPERIAL

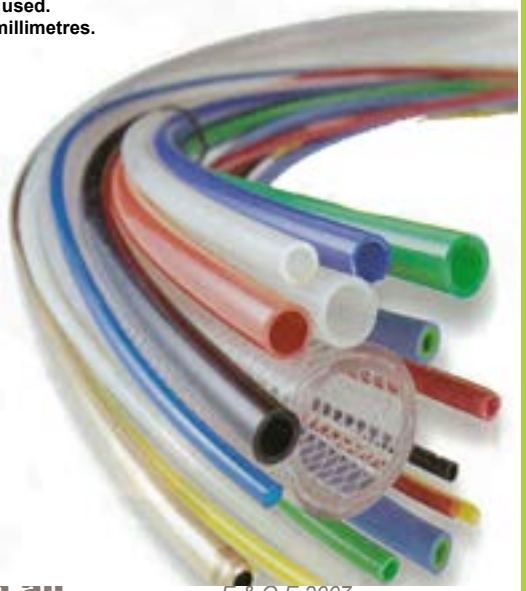
Product No.	OD	ID	Wall Thickness	RWP PSI	RWP Bar	Min. Burst PSI	Min. Burst Bar	Kg 100m	Min. Bend Radius
NT5/8N	*5/8*	*0.495*	*0.065*	*125*	*8.5*	*500*	*34.5*	*7.70*	*4.3/8*
NT3/4N	*3/4*	*0.590*	*0.080*	*125*	*8.5*	*500*	*34.5*	*11.00*	*5.1/4*
NT1N	*1*	*0.820*	*0.090*	*125*	*8.5*	*500*	*34.5*	*17.30*	*7*

Note: All Product Nos. shown are for Natural - for black substitute BK.

NYLON TUBE RECOMMENDED MAXIMUM WORKING PRESSURE

Temp.F / C	0 / -18	32 / 0	50 / 10	75 / 25	100 / 38	125 / 52	150 / 66	175* / 80*	200* / 93*	225* / 107*	250* / 120*
BLUE *Brand Imperial*	*600*	*575*	*550*	*500*	*400*	*315*	*240*	*175*	*125*	*85*	*60*
BLUE *Brand Metric*	*680*	*650*	*625*	*575*	*450*	*380*	*275*	*200*	*140*	*90*	*65*
YELLOW *Brand Imperial*	*1100*	*1075*	*1050*	*1000*	*800*	*625*	*475*	*350*	*250*	*170*	*120*
ORANGE *Brand Imperial*	*300*	*290*	*275*	*250*	*200*	*160*	*120*	*90*	*60*	*40*	*33*

***For continuous operation at these temperatures, only black tubing should be used.**
All dimensions for imperial tubing: inches. All dimensions for metric tubing: millimetres.



SELF STORE HOSE

Self Store Hose is a helically formed tube made from premium grade nylon. It is lightweight, extremely strong, abrasion-resistant and has excellent chemical resistant characteristics.

The hose is easily extended to work stations with minimum effort - leaving work areas and walkways clear of trailing hose.

Made from premium grade nylon, and coloured bright yellow for safety, Self Store Hose maintains its properties and resilience at extremes of heat and cold.

It is ideal for conveying gases and liquids eg. water cooling, lubricants, air supply to pneumatic tools etc.

The hose features low absorption of oils and chemicals and resists staining.

Self Store Hose is made coiled and will never uncoil. However, if the hose gets slow to retract after being fully extended at high temperature for long periods, simply pull the coil inside out to restore its retractibility.

It is recommended that Self Store Hose not be extended more than 50% of its actual length.

Product No.	ID mm	ID inches	Working Press. (at 20ºC) MPa	PSI	Std Coil Length mtrs
SSN14030	*6*	*1/4*	*1.2*	*175*	*30*
SSN38030	*10*	*3/8*	*1.2*	*175*	*30*
SSN50030	*12.5*	*1/2*	*1.2*	*175*	*30*
SSN75030	*20*	*3/4*	*1.2*	*175*	*30*

We recommend the use of end fittings specifically manufactured for Self Store Nylon Tubing. Refer page 118.

FITTINGS TO SUIT NYLON TUBING

There are a number of compression and push-on type fittings on the market for use with nylon tubing. We will be able to assist with the most suitable fitting for your particular application.

PUSH FIT

PUSH FIT

Pressure: 1725kPa up to 5/16 and 1.400kPa up to 1/2 (up to 30ºC)
Temperature: -15ºC to +120ºC. *Typical Uses:* Pneumatic installations.

STANDARD COMPRESSION

STANDARD COMPRESSION

Pressure: Medium pressure ratings around 3,500kPa (500psi) decreasing as tube sizes increase and depending on material (liquid or air) ratings will vary. Recommendations available on request.
Temperature: -20ºC to +120ºC. *Typical Uses:* Air lines, oil/petrol lines, water lines. For details consult sales department.

INTERNAL COMPRESSION

INTERNAL COMPRESSION

Pressure: Medium pressure ratings around 3,500kPa (500psi) decreasing as tube sizes increase and depending on material (liquid or air) ratings will vary. Recommendations available on request.
Temperature: -20ºC to +120ºC. *Typical Uses:* Air lines, oil/petrol lines, water lines or applications where vibration is a factor.

NYLON TUBE CUTTERS

Product No. 30007100 Nylon Tube Cutters
Product No. 3000710005 Spare Blades

POLYURETHANE

ATP polyurethane tubing is made from the highest quality raw materials available. It is ether-based to provide excellent hydrolysis, oil and cold resistnace. PUR is strong and flexible and offers superior kink resistance compared to other tubing. It is 5 to 10 times more wear resistant and lighter in weight than any rubber hose.

ATP's polyurethane tubing has an outside diameter made to extremely tight tolerances. It's ideal for use with push-to connect fittings, as well as barb-type and compression fittings for simple installation.

SPECIFICATIONS

Temperature Range: -5 to 60°C (Compressed Air)
0 to 40°C (Water)
Durometer: Shore A 98
Working pressure: See chart below

PACKAGE LENGTHS

Fractional: 30 metres & 100 metres (standard)
Metric: 20 metres & 100 metres (standard)

COLOURS AVAILABLE

BK - Black	G - Green	LG - Light Green
R - Red	C - Clear	NB - Navy Blue
CB - Clear Blue	Y - Yellow	W - White
LB - Light Blue	OR - Orange*	

**Not standard stock colours, please check for availability before ordering.Custom sizes, colours and durometers are available with minimum order quantity.*

METRIC SIZES:

Size	Part No.	I.D. (mm)	O.D. (mm)	Wall Thickness (mm)	Tolerance (mm) +	Tolerance (mm) -	W.P. @20C (Mpa)	3:1 Burst Pressure
4mm	ATE-04M	2.5	4.0	0.75	0.10	0.10	1.0	3.0
6mm	ATE-06M	4.0	6.0	1.00	0.10	0.10	1.0	3.0
8mm	ATE-08M	5.0	8.0	1.50	0.10	0.10	1.0	3.0
10mm	ATE-010M	6.5	10.0	1.75	0.10	0.15	1.0	3.0
12mm	ATE-012M	8.0	12.0	2.00	0.10	0.15	1.0	3.0
16mm	ATE-016M	11.0	16.0	2.50	0.10	0.15	1.0	3.0

FRACTIONAL SIZES:

Size	Part No.	I.D. (mm)	O.D. (mm)	Wall Thickness (in)	Tolerance (in) +	Tolerance (in) -	W.P. @20F (PSI)	3:1 Burst Pressure
1/8"	ATE-18	0.062	0.125	0.031	0.004	0.004	140	428
5/32"	ATE-532	0.093	0.156	0.031	0.004	0.004	140	428
3/16"	ATE-316	0.125	0.187	0.031	0.004	0.004	140	428
1/4"	ATE-14	0.156	0.250	0.047	0.004	0.004	140	428
5/16"	ATE-516	0.187	0.312	0.063	0.004	0.004	140	428
3/8"	ATE-38	0.250	0.375	0.063	0.004	0.006	140	428
1/2"	ATE-12	0.328	0.500	0.086	0.004	0.006	140	428
9/16"	ATE-916	0.375	0.562	0.093	0.004	0.006	140	428
5/8"	ATE-58	0.406	0.625	0.109	0.004	0.006	140	428
3/4"	ATE-34	0.500	0.750	0.125	0.005	0.006	140	428

POLYURETHANE ANTI-FLAMING

ATP AF was developed for robotics welding applications where the tubing is damaged by welding spatters. ATP AF can be connected with one-touch fitting without removing the outer jacket. ATP AF tubing is made from highest quality raw materials available. It is ether-based with special rubber material. The material in use for ATP AF is equivalent of UL-94 V0.

SPECIFICATIONS

Temperature Range -5 to 60°C (Compressed Air)
0 to 40°C (Water)
Working pressure See chart below

PACKAGE LENGTHS

Metric 100 metres (standard)

COLOURS AVAILABLE

BK - Black	G - Green	LB - Light Blue
R - Red	Y - Yellow	W - White

METRIC SIZES:

Size	Part No.	I.D. (mm)	O.D. (mm)	Wall Thickness (mm)	Tolerance (mm) +	Tolerance (mm) -	W.P. @20°C (Mpa)	3:1 Burst Pressure
6mm	***AF-06M***	*4.0*	*6.0*	*1.00*	*0.102*	*0.102*	*1.0*	*3.0*
8mm	***AF-08M***	*5.0*	*8.0*	*1.50*	*0.102*	*0.102*	*1.0*	*3.0*
10mm	***AF-010M***	*6.5*	*10.0*	*1.75*	*0.102*	*0.150*	*1.0*	*3.0*
12mm	***AF-12M***	*8.0*	*12.0*	*2.00*	*0.102*	*0.150*	*1.0*	*3.0*
16mm	***AF-16M***	*11.0*	*16.0*	*2.50*	*0.102*	*0.150*	*1.0*	*3.0*

POLYURETHANE COVERED ANTI-FLAMING

ATP LE was specially developed for robotics welding applications where the tubing is damaged by welding spatters. This tubing is covered by an olefinplastic (Flame resistant type.) The covered material in use for ATP LE is equivalent of UL-94 V0.

SPECIFICATIONS

Temperature Range -5 to 60°C (Compressed Air)
0 to 40°C (Water)
Working pressure See chart below

PACKAGE LENGTHS

Metric 20 metres & 100 metres (standard)

COLOURS AVAILABLE

BK - Black	G - Green	LB - Light Blue
R - Red	Y - Yellow	W - White

METRIC SIZES:

Size	Part No.	I.D. (mm)	O.D. (mm)	Wall Thickness (mm)	W.P. @20°C (Mpa)	3:1 Burst Pressure
6mm	***LE-06M***	4.0	6.0	1.00	1.0	3.0
8mm	***LE-08M***	5.0	8.0	1.50	1.0	3.0
10mm	***LE-10M***	6.5	10.0	1.75	1.0	3.0
12mm	***LE-12M***	8.0	12.0	2.00	1.0	3.0

LDPE – LOW DENSITY POLYETHYLENE TUBING

LDPE is made from 100% non-toxic ingredients. It's inert nature and FDA approved status makes it perfect for food, water and beverage piping. It is ideal for use in pneumatic, drain piping, lab use and chemical transfer applications which require an inexpensive tubing.

Polyethylene is highly-resistant to stress cracking from chemicals, aging and ultraviolet exposure. For use with barb-type, push to connect or compression style fittings.

SPECIFICATIONS

Temperature Range -10 to 50°C
Colour Natural

PACKAGE LENGTHS

Metric 20 and 100 metres

Custom sizes and colours are available with minimum order quantity.

METRIC SIZES:

Size	Part No.	I.D. (mm)	O.D. (mm)	Tolerance (mm) + -	B.P. @ 20°C	W.P. @ 20°C
4mm	**PE04NA**	2.5	4.0	+ 0.1 mm - 0.1 mm	3.0Mpa	1.0Mpa
6mm	**PE06NA**	4.0	6.0		3.0Mpa	1.0Mpa
8mm	**PE08NA**	6.0	8.0		3.0Mpa	1.0Mpa
10mm	**PE10NA**	7.5	10.0		3.0Mpa	1.0Mpa
12mm	**PE12NA**	9.0	12.0		3.0Mpa	1.0Mpa
16mm	**PE16NA**	12.0	16.0		3.0Mpa	1.0Mpa

IMPERIAL SIZES:

Size	Part No.	I.D. (in)	Wall Thickness (in)	Tolerance (in) +	-	W.P. @ 70°F (PSI)	3:1 Burst Pressure
1/4"	**PE1/4NA**	.170	.040	.005	.005	150	450
3/8"	**PE3/8NA**	.250	.062	.005	.005	125	375
1/2"	**PE1/2NA**	.375	.062	.005	.005	100	300

TECHNIBOND POLYURETHANE BONDED

INTRODUCING TECHNIBOND FROM ADVANCED TECHNOLOGY PRODUCTS

This high-tech process allows ATP to bond polyurethane tubing into straight or spiral configurations creating organized groups. Ideal for applications where several tubes or spirals must travel together. Harness all of your air, oil, water and electrical needs into one complete, colour-coded package.

A very important benefit of ATP's Technibond process is that it isn't moulded together in a coextrusion process. This method of bonding causes bore and shape distortion. By forming the bundles in a second step, Technibond tubing can still be used with push-to-connect fittings for easy installation, and the groups can be easily stripped /separated to any length without damaging the tubing integrity.

Technibond is an efficient and attractive way to colour-code your tubing runs. Bonded tubing allows for quicker installation time of multiple lines by eliminating costly repetition and vinyl sleeving, or the second step of installing tubing identification numbers, cable ties and spiral wraps.

Technibond was originally created for OEM engineers and designers of:
• Process Controls • Pneumatic Hoists • Instrumentation • Pick & Place Equipment • Automation Equipment • Robotics • Motion Control Devices • Multiple-controlled Pneumatic Tools.

However, Technibond's versatility makes it an excellent choice for end users, as well. Plant Engineers and Maintenance Supervisors looking for a better way to troubleshoot, test and update existing equipment will find Technibond to be an ideal solution.

DESIGN YOUR OWN

ATP offers a complete selection of standard, stock items in both straight and spiral styles. We realize that your application is unique. When no ordinary Multi will do, we specialize in creating configurations to our customers exact specifications.

Any size and color of ATP tubing can be bonded together.

OTHER BONDING CAPABILITIES

The Technibond process also allows us to bond materials other than polyurethane including:

- Weld Tubing Nylon
- Urethane Jacketed Hydraulic Hose

OUR PRECISION-MADE TUBING

ATP's Technibond products start with our polyurethane tubing which is made from the highest-quality raw materials available. It is ether-based to provide excellent hydrolysis, oil and cold resistance. PUR is strong and flexible and offers superior kink resistance compared to other tubing. It is 5 to 10 times lighter in weight than any rubber hose.

ATP's polyurethane tubing has an outside diameter made to extremely tight tolerances. It is ideal for use with push-to-connect fittings, as well as barb-type and compression fittings for simple installation.

Custom sizes, colours and durometers are available with minimum order quantity.

SPECIFICATIONS

Temperature Range	-5 to 60°C
Durometer	Shore A 98
Working pressure	1 Mpa

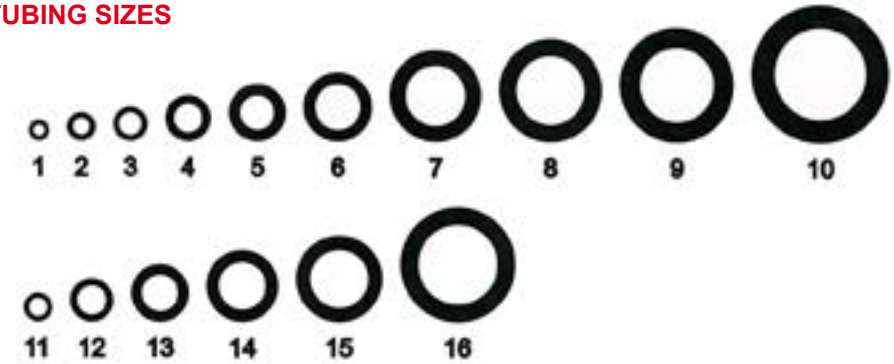
**Not standard stock colours, please check availability*

COLOURS AVAILABLE

BK - Black	G - Green	LG - Light Green
R - Red	C - Clear	NB - Navy Blue
CB - Clear Blue	Y - Yellow	W - White
LB - Light Blue	OR - Orange*	

REF: 60-1107

STANDARD TUBING SIZES



	1	2	3	4	5	6	7	8
OD	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	9/16"
ID	1/16"	3/32"	1/8"	5/32"	3/16"	1/4"	21/64"	3/8"

	9	10	11	12	13	14	15	16
OD	5/8"	3/4"	4mm	6mm	8mm	10mm	12mm	16mm
ID	13/32"	1/2"	2.5mm	4mm	5mm	6.5mm	8mm	11mm

Illustrations are shown at actual size.

ADD ELECTRIC

ATP stocks a five-conductor, 22-gauge wire, coated with polyurethane which bonds directly to our tubing. This wire can be stripped neatly to your desired length, without distortion or damage to the tubing.

Ask us about other wire types. We would be glad to work with you to meet your requirements.

COLOURS & CONFIGURATION

APT has chosen its most popular sizes, colours and configurations and now offers them as standard stock items.

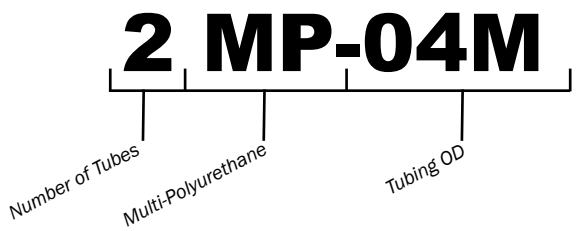
All configurations are available in both fractional and metric sizes. Fractional lengths from 25 to 1000 feet, and metric lengths from 10 to 300 metres.

- Our 2MP (two tubes) is available in standard combinations - black and light blue.
- 3MP (three tubes) is standard in black / light blue /yellow.
- 4MP (four tubes) is standard in black / light blue / yellow / white.

Technicbond tubing can be easily stripped without damaging the tubing, making it easy to separate and route the tubes to different locations.

Colour and size combinations can be custom made. The above is standard stocked products only. Contact us for your customised application.

PART NUMBERING SYSTEM



ROLL SIZES

10, 20, 50 & 100 metres

4mm OD x 2.5mm ID	6mm OD x 4mm ID	8mm OD x 5mm ID	10mm OD x 6.5mm ID	12mm OD x 8mm ID

TWO	THREE	FOUR
2MP - 04M	*3MP - 04M*	*4MP - 04M*
2MP - 06M	*3MP - 06M*	*4MP - 06M*
2MP - 08M	*3MP - 08M*	*4MP - 08M*
2MP - 10M	*3MP - 10M*	*4MP - 10M*
2MP - 12M	3MP - 12M	4MP - 12M

POLYURETHANE RECOIL HOSE

H.I.S. Recoil Hoses are superior because we start with our 98 Durometer, Shore A tubing. This gives our spirals improved “memory,” allowing the hose to retract faster and better than softer durometer hoses. Sagging and tangling is minimal, and kinking is virtually eliminated. A harder durometer also provides a smoother bore for better airflow, better abrasion resistance, and a longer service life. Polyurethane spirals feature a compact, space-saving design versus nylon coils, and with a smooth, 90 transformation from coil to tail, it makes it more ergonomic for the user.

SPIRAL HOSE TERMINOLOGY

Total Length: This will be the total length of the tubing before spiralling.

Working Length: Also known as Service Length. Defined by how far the spiral will stretch. Working length in standard spirals is approximately 80% of the total length. We are able to quote spirals by working length if you know how far you need the spiral to stretch from point A to point B. We are also able to quote by the number of turns.

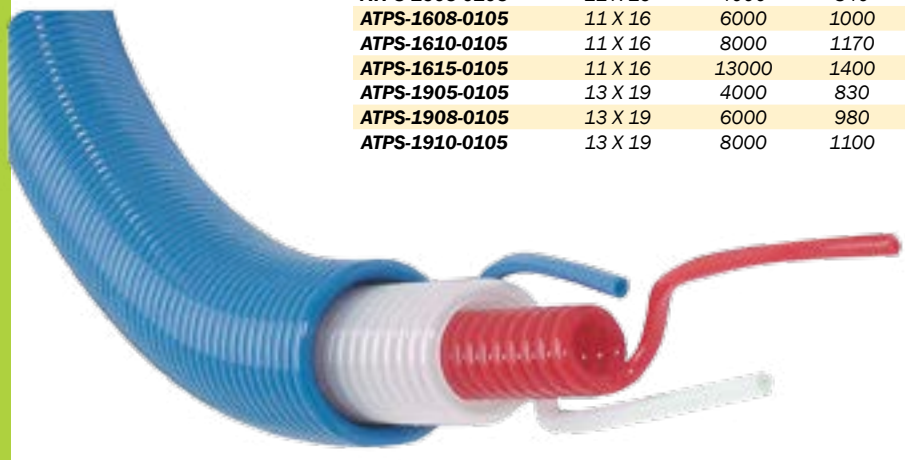
Tail Length: Tail length dimensions are included in both total and service length dimensions. If necessary, we can quote compressed coils and add tail lengths to arrive at your requirements.

Coil ID: Our coil ID is determined by the size of the tubing being spiralled. This ID is small enough to allow the spiral to retract and prevent it from sagging while still providing optimum air flow without flattening the tubing.

SPECIFICATIONS

Temperature range: -5 to 60°C (Air)
Burst pressure: 3 Mpa
Working pressure: 1 Mpa

Part Number	Hose Size (mm)	Service Length (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
ATPS-0603-0105	*4 X 6*	*2000*	*715*	*500*	*115*	*100*	*38*
ATPS-0605-0105	*4 X 6*	*4000*	*890*	*500*	*290*	*100*	*38*
ATPS-0608-0105	*4 X 6*	*6000*	*1070*	*500*	*470*	*100*	*38*
ATPS-0803-0105	*5 X 8*	*2000*	*780*	*500*	*180*	*100*	*42*
ATPS-0805-0105	*5 X 8*	*4000*	*1000*	*500*	*400*	*100*	*42*
ATPS-0808-0105	*5 X 8*	*6000*	*1230*	*500*	*630*	*100*	*42*
ATPS-0810-0105	*5 X 8*	*8000*	*1400*	*500*	*800*	*100*	*42*
ATPS-0812-0105	*5 X 8*	*10000*	*1470*	*500*	*870*	*100*	*42*
ATPS-0815-0105	*5 X 8*	*13000*	*1700*	*500*	*1100*	*100*	*42*
ATPS-1003-0105	*6.5 X 10*	*2000*	*785*	*500*	*185*	*100*	*52*
ATPS-1005-0105	*6.5 X 10*	*4000*	*1000*	*500*	*400*	*100*	*52*
ATPS-1008-0105	*6.5 X 10*	*6000*	*1235*	*500*	*635*	*100*	*52*
ATPS-1010-0105	*6.5 X 10*	*8000*	*1400*	*500*	*800*	*100*	*52*
ATPS-1012-0105	*6.5 X 10*	*10000*	*1490*	*500*	*890*	*100*	*52*
ATPS-1015-0105	*6.5 X 10*	*13000*	*1980*	*500*	*1380*	*100*	*52*
ATPS-1203-0105	*8 X 12*	*2000*	*780*	*500*	*180*	*100*	*65*
ATPS-1205-0105	*8 X 12*	*4000*	*1000*	*500*	*390*	*100*	*65*
ATPS-1208-0105	*8 X 12*	*6000*	*1190*	*500*	*590*	*100*	*65*
ATPS-1210-0105	*8 X 12*	*8000*	*1380*	*500*	*780*	*100*	*65*
ATPS-1212-0105	*8 X 12*	*10000*	*1400*	*500*	*800*	*100*	*65*
ATPS-1215-0105	*8 X 12*	*13000*	*1620*	*500*	*1020*	*100*	*65*
ATPS-1230-0105	*8 X 12*	*26000*	*2200*	*500*	*1600*	*100*	*100*
ATPS-1603-0105	*11 X 16*	*2000*	*720*	*500*	*120*	*100*	*108*
ATPS-1605-0105	*11 X 16*	*4000*	*840*	*500*	*240*	*100*	*108*
ATPS-1608-0105	*11 X 16*	*6000*	*1000*	*500*	*400*	*100*	*108*
ATPS-1610-0105	*11 X 16*	*8000*	*1170*	*500*	*570*	*100*	*108*
ATPS-1615-0105	*11 X 16*	*13000*	*1400*	*500*	*800*	*100*	*108*
ATPS-1905-0105	*13 X 19*	*4000*	*830*	*500*	*230*	*100*	*115*
ATPS-1908-0105	*13 X 19*	*6000*	*980*	*500*	*380*	*100*	*115*
ATPS-1910-0105	*13 X 19*	*8000*	*1100*	*500*	*500*	*100*	*115*



REF: 60-1107

TECHNIBOND PUR RECOIL HOSE

H.I.S. offers these standard, spiraled configurations in both fractional and metric:

- **Two Bore Spirals**
  Our 2MPS (two tubes) is stocked black/light blue colours.
- **Three Bore Spirals**
  3MPS (three tubes) is stocked black/lightblue/yellow colours.
  3MPS spirals are configured in a ribbon style.
- **Four Bore Spirals**
  4MPS (four tubes) is stocked in black/light blue/yellow/white colours. They are configured in a stacked style to allow for a more compact spiral.

Each spiral is supplied with heat shrink at the 90° bend to help eliminate tube separation within the coil. These colour combinations are the stocked product only. Please contact us for your customised colour or tube size requirements. Our Spiralled Technibond part numbering system is based on the number of complete turns of the spiral. Other definitions you will need to know to order the proper spiral for your application will be:

PART NUMBERING SYSTEM

2 MPS-04M-05

- 2 — Number of Tubes
- MPS — Multi-Polyurethane
- 04M — Tubing OD
- 05 — Turns

WORKING LENGTH

Also known as the Service Length. Defined by how far the spiral will stretch from Point A to Point B. This length included the tails.

DIMENSION A

The overall compressed length from the end of Tail B to the end of Tail D.

DIMENSION B & D (TAILS)

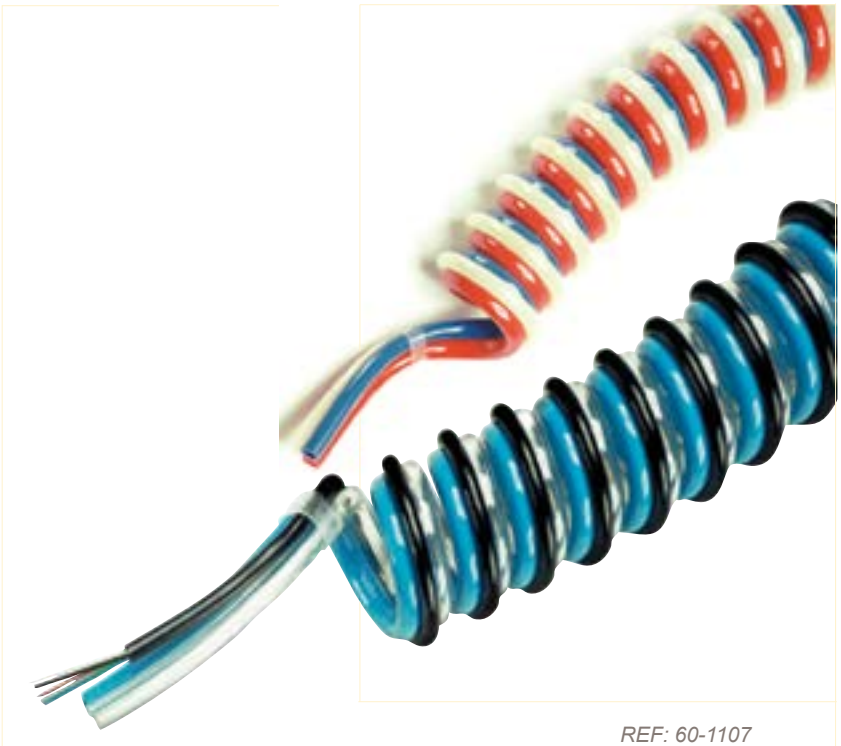
The uncoiled lengths at each end of the spiral. Tail Lengths are measured from the end of the last coil, and are included in the working length.

DIMENSION C

The measurements of all the coils when compressed.

DIMENSION E

The outside diameter of the coil.



REF: 60-1107

2 MPS


4mm OD
x 2.5mm ID


6mm OD
x 4mm ID


8mm OD
x 5mm ID


10mm OD
x 6.5mm ID


12mm OD
x 8mm ID

Tube OD	Part Number	Turns	Working Length (mm)	A (mm)	B & D (mm)	C (mm)	E (mm)
4mm	**2MPS-04M-05**	5	375	240	200	40	24
	2MPS-04M-10	10	600	280	200	80	24
	2MPS-04M-15	15	852	320	200	120	24
	2MPS-04M-20	20	1050	360	200	160	24
	2MPS-04M-30	30	1510	440	200	240	24
	2MPS-04M-40	40	1970	520	200	320	24
6mm	**2MPS-06M-05**	5	510	360	200	60	37
	2MPS-06M-10	10	860	320	200	120	37
	2MPS-06M-15	15	1230	380	200	180	37
	2MPS-06M-20	20	1600	440	200	240	37
	2MPS-06M-30	30	2300	560	200	360	37
	2MPS-06M-40	40	3020	680	200	480	37
8mm	**2MPS-08M-05**	5	530	280	200	80	41
	2MPS-08M-10	10	910	360	200	160	41
	2MPS-08M-15	15	1300	440	200	240	41
	2MPS-08M-20	20	1680	520	200	320	41
	2MPS-08M-30	30	2430	680	200	480	41
	2MPS-08M-40	40	3200	840	200	640	41
10mm	**2MPS-10M-05**	5	620	300	200	100	52
	2MPS-10M-10	10	1100	400	200	200	52
	2MPS-10M-15	15	1600	500	200	300	52
	2MPS-10M-20	20	2050	600	200	400	52
	2MPS-10M-30	30	3010	800	200	600	52
	2MPS-10M-40	40	3960	1000	200	800	52
12mm	**2MPS-12M-05**	5	780	320	200	120	66
	2MPS-12M-10	10	1380	440	200	240	66
	2MPS-12M-15	15	2000	560	200	360	66
	2MPS-12M-20	20	2620	680	200	480	66
	2MPS-12M-30	30	3870	920	200	720	66
	2MPS-12M-40	40	5120	1160	200	960	66

3 MPS


4mm OD
x 2.5mm ID


6mm OD
x 4mm ID


8mm OD
x 5mm ID


10mm OD
x 6.5mm ID


12mm OD
x 8mm ID

Tube OD	Part Number	Turns	Working Length (mm)	A (mm)	B & D (mm)	C (mm)	E (mm)
4mm	**3MPS-04M-05**	5	450	260	200	60	30
	3MPS-04M-10	10	750	320	200	120	30
	3MPS-04M-15	15	1050	380	200	180	30
	3MPS-04M-20	20	1350	440	200	240	30
	3MPS-04M-30	30	1940	560	200	360	30
	3MPS-04M-40	40	2540	680	200	480	30
6mm	**3MPS-06M-05**	5	580	290	200	90	44
	3MPS-06M-10	10	930	380	200	180	44
	3MPS-06M-15	15	1450	470	200	270	44
	3MPS-06M-20	20	1900	560	200	360	44
	3MPS-06M-30	30	2740	740	200	540	44
	3MPS-06M-40	40	3600	920	200	720	44
8mm	**3MPS-08M-05**	5	600	320	200	120	48
	3MPS-08M-10	10	1050	440	200	240	48
	3MPS-08M-15	15	1520	560	200	360	48
	3MPS-08M-20	20	1980	680	200	480	48
	3MPS-08M-30	30	2880	920	200	720	48
	3MPS-08M-40	40	3780	1160	200	960	48
10mm	**3MPS-10M-05**	5	750	350	200	150	63
	3MPS-10M-10	10	1350	500	200	300	63
	3MPS-10M-15	15	1950	650	200	450	63
	3MPS-10M-20	20	2580	800	200	600	63
	3MPS-10M-30	30	3760	1100	200	900	63
	3MPS-10M-40	40	4970	1400	200	1200	63
12mm	**3MPS-12M-05**	5	970	380	200	180	84
	3MPS-12M-10	10	1800	560	200	360	84
	3MPS-12M-15	15	2650	740	200	540	84
	3MPS-12M-20	20	3450	920	200	720	84
	3MPS-12M-30	30	5070	1280	200	1080	84
	3MPS-12M-40	40	6730	1640	200	1080	84

POLYURETHANE BRAIDED HOSE

- Uniform implantation of a sturdy nylon reinforcement produces out-standing durability.
- Due to the special properties of Polyurethane hose, a strong and reliable connection between hose and fitting can be achieved, thus eliminating the use of obstruction clamp.
- Excellent flexibility. Softer than nylon hose with rubber like elasticity so bending radius is very small.
- Superior heat and cold resistance.

SPECIFICATIONS

Temperature Range	-5 to 60°C (Air)
Burst Pressure	60Mpa
Working Pressure	1.5Mpa

PACKAGE LENGTHS

Metric 20 and 100 metres (standard)

COLOURS AVAILABLE

LB - Light Blue OR - Orange

Custom sizes and colours are available with minimum order quantity.

METRIC SIZES:

Part Number	I.D. (mm)	O.D. (mm)	W.P. @ 20°C	W.P. @ 60°C	Minimum Bend Radius (mm)	Weight (g/m)
BH-6X9	6	9	1.5	0.6	45	45
BH-6.5X10	6.5	10	1.5	0.6	50	55
BH-8X12	8	12	1.5	0.6	60	76
BH-11X16	11	16	1.5	0.6	80	132

CHEMICAL RESISTANCE

CHEMICAL NAME/MAT	RATING	Polyurethane RATING	Nylon12 RATING	Polyethylene RATING	Fluorine RATING	PVC RATING
acetaldeyde	-	A	-	Z	E
acetic acid (10%, 20C)	Z	A	-	A	Z
acetic acid (100%, 20C)	Z	-	-	A	E
acetic acid (50%, 20C)	Z	Z	-	A	E
acetic acid (80%, 70C)	Z	-	-	A	E
acetic, 3n	B	E	A	-	-
acetone	D	A	D	E	E
acetylene	-	A	-	A	A
acrylonitrile	-	-	-	A	E
alum	-	A	-	A	A
aluminium acetate	-	-	-	A	A
aluminium chloride	-	-	-	A	Z
aluminium chloride 10%	B	-	A	-	-
aluminium fluoride	-	-	-	A	Z
aluminium sulfate	-	A	-	A	A
ammonia gas (cold)	-	A	-	A	E
ammonia gas (hot)	-	A	-	A	E
ammonia, 3n	A	A	-	-	-
ammonium carbonate	-	A	-	A	A
ammonium chloride, 10%	B	A	A	A	A
ammonium nitrate	-	A	-	A	-
ammonium phosphate	-	A	-	A	Z
ammonium sulfate	-	A	-	A	A
amyl alcohol	Z	A	-	A	E
aniline	D	B	B	-	-
aniline	-	Z	-	A	E
arsenic acid	-	-	-	A	Z
ASTM Fuel A	A	-	-	-	-
ASTM Fuel B	C	-	-	-	-
ASTM Fuel C	C	-	-	-	-
ASTM Oil #1	A	-	-	-	-
ASTM Oil #2	A	-	-	-	-
ASTM Oil #3	A	-	-	-	-
barium chloride	-	A	-	A	A
barium Hydroxide	-	-	-	A	A
barium sulfide	-	A	-	A	Z
barium sulfate	-	A	-	A	A
benzaldehyde	Z	A	-	E	E
benzene	D	A	-	-	-
benzene (benzol)	Z	A	-	A	E
benzyl alcohol	E	Z	-	A	E
benzoic acid	Z	A	-	A	-
bleaching agent, 100%	B	E	-	-	-
bleaching agent, 40%	A	E	-	-	-
boracic acid	-	E	-	A	Z
borax	-	A	-	Z	Z
boric, 4%	B	A	A	-	-
brake fluid (ATE or ATS)	D	A	-	-	-
bromine	-	E	-	A	E
butane	B	A	-	-	-
butyl acetate	D	A	B	E	E
butyl alcohol (butanol)	D	A	A	A	E
calcium acetate	-	-	-	A	A
calcium chloride, 40%	B	A	A	A	A
calcium grease	A	-	-	-	-
calcium hydroxide	-	A	-	A	A
calcium nitrate	-	A	-	Z	A
carbon bisulfide	-	-	-	E	E
carbon monoxide	A	-	-	A	-
carbon tetrachloride	D	A	D	A	E

CHEMICAL NAME/MAT	RATING	Polyurethane RATING	Nylon12 RATING	Polyethylene RATING	Fluorine RATING	PVC RATING
carbonic acid	-	A			
carbonic acid gas	A	-			
caustic soda (30%, 20C)	E	A			
caustic soda (30%, 70C)	E	E			
caustic soda 10%	A	A			
cellosolve	-	-			
chlorine gas (dry)	-	E			
chlorine gas (wet)	-	E			
chlorobenzene	D	C			
chloroform	D	C			
chlorosulfonic acid	E	E			
chromic acid (10%, 70C)	-	E			
chromic acid (2%, 50C)	-	-			
chromic acid (2%, 70C)	-	-			
chromic acid (25%, 70C)	-	E			
chromic, 3n	D	E			
citric acid	A	-			
citric, 3n	B	-			
copper chloride	-	A			
copper cyanide	-	-			
copper sulfate	-	A			
cresol	Z	E			
cyclohexanol	C	A			
cyclohexanone	-	A			

RESISTANCE RATING

A - EXCELLENT
B - GOOD
C - FAIR
D - POOR
E - DISSOLVES
Z - NEED THROUGH CONFIRMATION

*In case of marked with Z, confirm working pressure, maximum working temperature, concentration, and applications before contacting us.

WARNING:
This table is a general guide based on our testing. Although every effort was made to ensure its accuracy, we cannot guarantee your results due to variables in temperature and application. Therefore, no warranty is expressed or implies, and the user assumes all risk and liabilities.

CHEMICAL RESISTANCE

CHEMICAL NAME/MAT	Polyurethane RATING	Nylon12 RATING	Polyethylene RATING	Fluorine RATING	PVC RATING
deca hydro naphthalene	-	A	-	A	-
dibutyl phthalate	Z	-	-	E	E
diesel fuel	B	A	-	-	-
dimethyl formamide	E	A	-	E	E
dioctyl phthalate (DOP)	A	-	C	-	-
epichlorohydrin	-	-	-	E	E
ethanol	C	-	B	-	-
ether	C	A	-	-	-
ethylene dichloride	-	Z	-	A	E
ethyl acetate	D	A	C	-	-
ethyl acetate	E	A	-	E	E
ethyl alcohol (ethanol)	Z	A	-	A	E
ethyl ether - ether (diethyl ether)	Z	A	-	A	E
ethylene chloride	B	C	D	-	-
ethylene glycol	-	A	-	A	E
ethylene glycol/water 50/50	B	-	-	-	-
ethylene oxide	-	-	-	A	E
ethylenediamine	-	-	-	E	E
fatty acid	-	-	-	A	A
ferric chloride, 10%	B	A	A	A	A
ferric sulfate	-	A	-	A	Z
fluorine	-	E	-	Z	-
fluoroboric acid	-	-	-	A	Z
formaldehyde (40%, 20C)	Z	A	-	A	Z
formic acid (25%, 20C)	E	Z	-	A	E
formic acid (50%, 20C)	E	Z	-	A	E
formic acid (90%, 20C)	E	E	-	A	E
formic, 3n	D	A	A	-	-
freon 11, 12, 22	C	-	-	-	-
furan	-	-	-	E	E
gasohol (10-15% Methanol)	D	-	-	-	-
gasoline	A	A	-	A	E
gear box oil (SEA 90)	A	-	-	-	-
glucose	-	A	-	A	-
glycerin	A	A	-	A	E
glycerine & glycol	A	A	B	-	-
HC1, 3n	A	E	A	-	-
heptane	Z	A	D	-	-
hexane	B	A	-	A	E
high-test (super) gasoline	D	A	-	-	-
household cleaner	B	-	-	-	-
hydraulic fluid	B	-	-	-	-
hydraulic/water emulsion	B	-	-	-	-
hydrazine	-	-	-	Z	-
hydro bromic acid (20%, 20C)	E	-	-	A	E
hydro bromic acid (20%, 70C)	E	-	-	A	E
hydro bromic acid (37%, 20C)	E	-	-	A	E
hydrochloric acid (10%, 20C)	E	A	-	A	Z
hydrochloric acid (20%, 20C)	E	Z	-	A	Z
hydrochloric acid (20%, 80C)	E	E	-	A	E
hydrochloric acid (38%, 20C)	E	Z	-	A	E
hydrofluoric acid (10%, 20C)	E	-	-	A	Z
hydrofluoric acid (20%, 20C)	E	-	-	A	E
hydrofluoric acid (40%, 20C)	E	E	-	A	E
hydrogen	A	A	-	A	A
hydrogen peroxide (30%, 20C)	Z	-	-	A	Z
hydrogen peroxide (5%, 20C)	Z	A	-	A	Z
hydrogen peroxide (5%, 50C)	Z	E	-	A	Z

CHEMICAL NAME/MAT	Polyurethane RATING	Nylon12 RATING	Polyethylene RATING	Fluorine RATING	PVC RATING
hydrogen peroxide, 3%	A	A	A	-	-
hydrogen sulfide	-	A	-	A	Z
isopropyl alcohol	C	A	-	A	E
kerosine	A	A	-	A	Z
lactic, 3n	C	B	A	-	-
lead acetate	-	-	-	A	Z
lead nitrate	-	A	-	A	Z
linseed oil	-	A	-	A	E
magnesium chloride, 30%	B	A	A	A	A
magnesium hydroxide	-	A	-	A	A
magnesium sulfate	-	A	-	A	A
maleic acid	Z	-	-	Z	Z
methyl chloride	-	A	-	A	E
mercuric chloride	-	A	-	A	Z
mercury	-	A	-	A	A
methane	A	A	-	A	-
methanol	C	-	B	-	-
methyl acetate	D	-	-	-	-
methyl alcohol (methanol)	Z	A	-	A	E
methyl ethyl ketone	C	A	-	E	E
methyl glycol	D	-	-	-	-
methyl isobutyl ketone (Mbk)	Z	A	-	E	E
methylene chloride	D	E	D	-	-
mineral oil	A	A	C	A	E
monocholoroacetic acid	Z	-	-	Z	E
motor oil	A	A	B	-	-
naphtalene	-	A	-	A	Z
naptha	A	-	A	-	-
natural gas	A	A	-	A	A
natural perspiration	A	-	-	-	-
nickel chloride	-	A	-	A	A
nickel sulfate	-	A	-	A	A
nitric acid (10%, 20C)	Z	E	-	A	Z
nitric acid (10%, 70)	E	E	-	A	E
nitric acid (30%, 20C)	E	E	-	A	E
nitric acid (30%, 70)	E	E	-	A	E
nitric acid (61%, 20C)	E	E	-	A	E
nitric acid (fuming, 20C)	E	E	-	E	E
nitric acid, 3n	D	E	A	-	-
nitrobenzene	-	Z	-	A	E
nitrohydrochloric acid	E	E	-	A	E
n-methyl pyrrolidone	E	-	-	-	-
oleic acid	-	A	-	A	E
oxalic acid	A	A	-	A	Z
oxygen	A	A	-	A	A
ozone	A	Z	-	A	Z
palmitic acid	-	-	-	A	Z
paraffin oil	A	A	-	-	-
perchloric acid	Z	-	-	Z	Z
perchloroethylene	D	-	-	A	E
petroleum	B	A	-	-	-
phenol	A	E	-	A	E
phenylhydrazine	-	-	-	A	E
phosphoric acid (50%, 20C)	Z	A	-	A	A
phosphoric acid (50%, 70C)	Z	E	-	A	E
phosphoric acid (75%, 20C)	Z	-	-	A	Z
phosphoric, 3n	D	D	A	-	-
picric acid	-	A	-	Z	E
potassium chloride, 40%	B	A	A	A	A
potassium dichromate, 10%	B	C	A	-	-

CHEMICAL RESISTANCE

CHEMICAL NAME/MAT	Polyurethane RATING	Nylon12 RATING	Polyethylene RATING	Fluorine RATING	PVC RATING
potassium hydroxide	-	A	-	Z	A
potassium hydroxide, 3n	A	-	A	-	-
potassium nitrate	-	-	-	Z	A
potassium permanganate, 5%	D	D	A	A	Z
potassium sulfate	-	A	-	A	A
power steering fluid	B	-	-	-	-
pyridine	E	A	-	E	E
salicylic acid	-	A	-	Z	A
salt	A	A	-	A	A
sea water	A	A	A	A	-
silver nitrate	-	A	-	Z	Z
skydrol 500 oil	D	-	-	-	-
sodium bisulfate, 10%	B	A	A	-	-
sodium carbonate	-	A	-	A	A
sodium chloride, 10%	B	B	A	-	-
sodium grease	A	-	-	-	-
sodium hydroxide, <20%	A	A	A	-	-
sodium hydroxide, >20%	C	A	-	-	-
sodium hypochlorite (5%, 20C)	Z	-	-	A	Z
sodium hypochlorite (5%, 70C)	Z	-	-	A	E
sodium hypochlorite, PH 13	A	B	A	-	-
sodium nitrate	-	A	-	A	A
sodium peroxide	-	-	-	A	-
sodium phosphate	-	A	-	A	A
sodium silicate	Z	A	-	Z	-
sodium sulfate (mirabilite)	-	A	-	Z	A
sodium sulfide	-	A	-	Z	-
sodium sulfite	-	A	-	A	Z
sodium thiosulfate	-	A	-	A	A
stannic chloride	-	A	-	A	Z
steam (150C & below)	Z	-	-	A	E
steam (150C & over)	Z	-	-	Z	E
sulfur	A	A	-	A	Z
sulfuric acid (10%, 20C)	Z	A	-	A	A
sulfuric acid (10%, 70C)	E	E	-	A	E
sulfuric acid (30%, 20C)	E	Z	-	A	Z
sulfuric acid (30%, 70C)	E	E	-	A	E
sulfuric acid (98%, 20C)	E	E	-	A	E
sulfuric acid (fuming, 20C)	E	E	-	E	E
sulfuric <20%	A	B	A	-	-
sulfuric >20%	B	C	B	-	-
sulfurous acid	-	Z	-	A	Z
sulfurous acid gas	-	-	-	A	A
teflon grease	A	-	-	-	-
tetra ethyl acid	Z	-	-	A	E
tetrachloroethylene	D	-	-	-	-
tetrahydrofuran	D	B	D	E	E
toluene	D	A	D	A	E
trichloroethylene	D	C	D	-	-
tricresyl phosphate	D	-	-	-	-
turpentine (pine oil)	B	A	C	-	-
water (100C)	Z	A	-	A	A
water (24C)	A	A	-	A	A
xylene	D	A	-	A	E
zinc chloride	-	A	-	A	A

NOTES

H.I.S. HOSE

Proprietary Limited

ON-SITE INSTALLATION & SERVICE

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FLUID POWER SERVICE