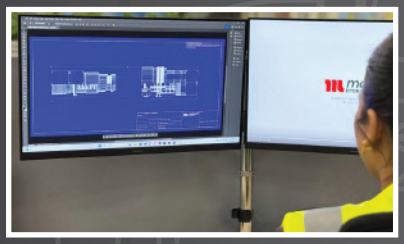
FORE master

At the Forefront of Hydraulics Excellence

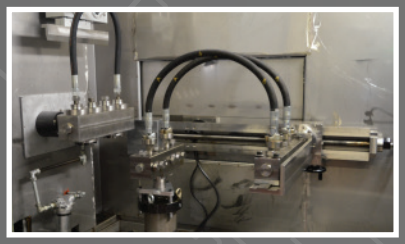
manuli® HYDRAULICS

"Manuli Hydraulics is focused on achieving excellence in the design, manufacture, and supply of fluid conveyance solutions, components and associated equipment for high pressure hydraulics, industrial material conveyance, refrigeration and cooling applications."



Our experienced Research & Development team take 2D drawings to 3D models to real life products.

Our world-class hoses, fittings and assembly equipment are manufactured in-house to the highest standards.



We test and validate our products to meet and exceed technical industry standards.

DESIGN → **MANUFACTURE** → **TEST**

SUPPLY ← **INTEGRATED SYSTEMS**

We provide the complete solution: hoses, fittings, crimping parameters and assembly equipment for a fully integrated system.

We supply fluid conveyance solutions directly to our customers whenever and wherever they are.

From design to manufacture, and assembly, Manuli Hydraulics' continual commitment to this unified philosophy makes us a global leader in providing integrated solutions for fluid and material transfer connector applications including hydraulics, refrigeration & air conditioning, oil & gas, water and industrial low-pressure.

Manuli Hydraulics offer a complete range of hoses, fittings and assembly equipment which are purposely designed to work seamlessly together. This harmonized approach allows us to guarantee the quality and performance of our hose assemblies.

Every metre of hose and every single fitting is backed by industry knowledge and experience, made available to you through our dedicated team of application engineers.

From advice on component selection and configuration, our technical expertise allows us to support and work directly with our customers whenever and wherever they are based.

Disclaimer: We reserve the right to modify our products and/or related services and/or discontinue the manufacture and/or supply of any of the products and/or related services, without notice. This document supersedes all previous versions and previously issued documentation. The only official source of technical crimping parameters regarding our products is our Digital Crimp Tools. Printed copies are uncontrolled therefore, please be sure to use the latest versions of our Manuli Crimp App or Crimp Web Tool. Don't mix and match: always use Manuli original hoses and fittings. For more information, see our 'Safety Guide'.

AT THE FOREFRONT OF HYDRAULICS EXCELLENCE

Here at Manuli Hydraulics, we thrive on innovation and the continuous development of our products to meet the ever-more demanding challenges of the hydraulics industry. Therefore, this end we have developed the ForeMaster range of isobaric hoses, which seamlessly merges state-of-the-art design with tried and trusted technology.

OUTSTANDING ABRASION RESISTANCE

Comprising four isobaric pressure ratings, the ForeMaster range offers long-lasting resistance to pressure impulse cycles (according to ISO 18752 Grade C), whilst simultaneously providing some of the highest impact and abrasion resistance available for a rubber-covered hose on the market today. With two distinct design philosophies related to the overall pressure ratings of the hoses, the ForeMaster range uses our proprietary ROC (Rubber Outstanding Cover) compound for the 21 MPa and 28 MPa families, and the innovative Armoured Cover concept for the 35 MPa and 42 MPa families. Both of these cover compounds represent the culmination of years of development and testing, to ensure that the service life of your hose is not limited by the life of the outer cover.

WIDE OPERATING TEMPERATURE RANGE

ForeMaster hoses feature a specially formulated rubber outer cover that resists extreme temperatures. This is particularly beneficial in industries where equipment operates in sub zero conditions.The cover compound remains crack-resistant at temperatures as low as -46°C due to an extremely low glass transition point (the point at which the material becomes brittle), preventing it from cracking well after other rubber compounds would have failed. In addition, the lowered transition phase temperatures allow the hose to retain its flexibility even in these severe conditions.

SUPERIOR FLEXIBILITY AND LOW BENDING FORCE

The ForeMaster hose range is also characterised by its high flexibility, making it ideal for use in restrictive locations. In particular, certain references within the 420 bar family offer a minimum bend radius and bending force requirement far lower than standard R12, R13 and 4SH hoses.

INTEGRATED FITTING SOLUTIONS FOR ALL SITUATIONS

As expected of the world's leading supplier of integrated hydraulic connector solutions, the ForeMaster range is fully equipped with a selection of dedicated fittings.

MULTIFIT

The primary fitting solution for the 21 MPa and 28 MPa families, Multifit is a robust, single-skive solution which combines one of the most comprehensive fittings ranges on the market with proven reliability and high-impulse resistance.

OPF

The one-piece, no-skive alternative solution for the two lower pressure families. Reliable, hassle-free and easy to fit in after-market maintenance situations.

INTERLOCK PLUS

Designed for maximum durability, this robust fitting has been tested for over 1,000,000 impulse cycles. Suitable for both the 35 MPa and 42 MPa lines, this is a double-skive solution suited to the most demanding of applications.

SPIRALFIT

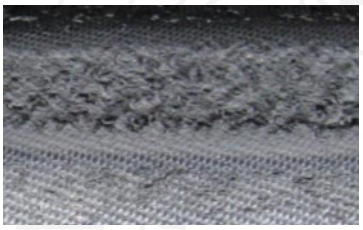
A convenient, no-skive fitting solution, designed to facilitate field maintenance and after-market distribution. This fitting solution is available for the 35 MPa family.

PUTTING IT TO THE TEST

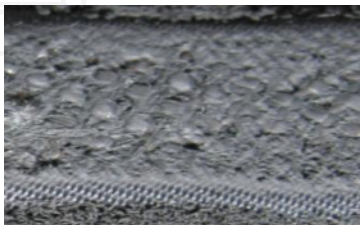
In standard ISO 6945 abrasion tests, a reciprocating 5 kg load is used to create wear on the hose cover. The test lasts for 2,000 cycles and measures the mass of material lost. The lower the result, the better the performance.

However, to truly test the performance of the Armoured Cover, Manuli devised a more severe test. A 10 kg reciprocating load was used, and the number of cycles required to expose the steel reinforcement was determined.Therefore, higher results indicate stronger capability.

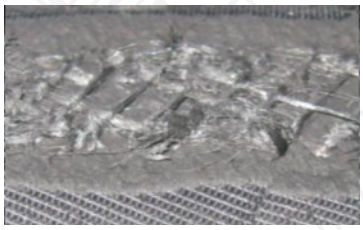
In standard ISO 6945 abrasion tests, hoses with the Armoured Cover delivered up to four times greater abrasion resistance than competing products and lasted up to 30 times longer before exposing the steel reinforcement.



2,000 CYCLES (10KG)



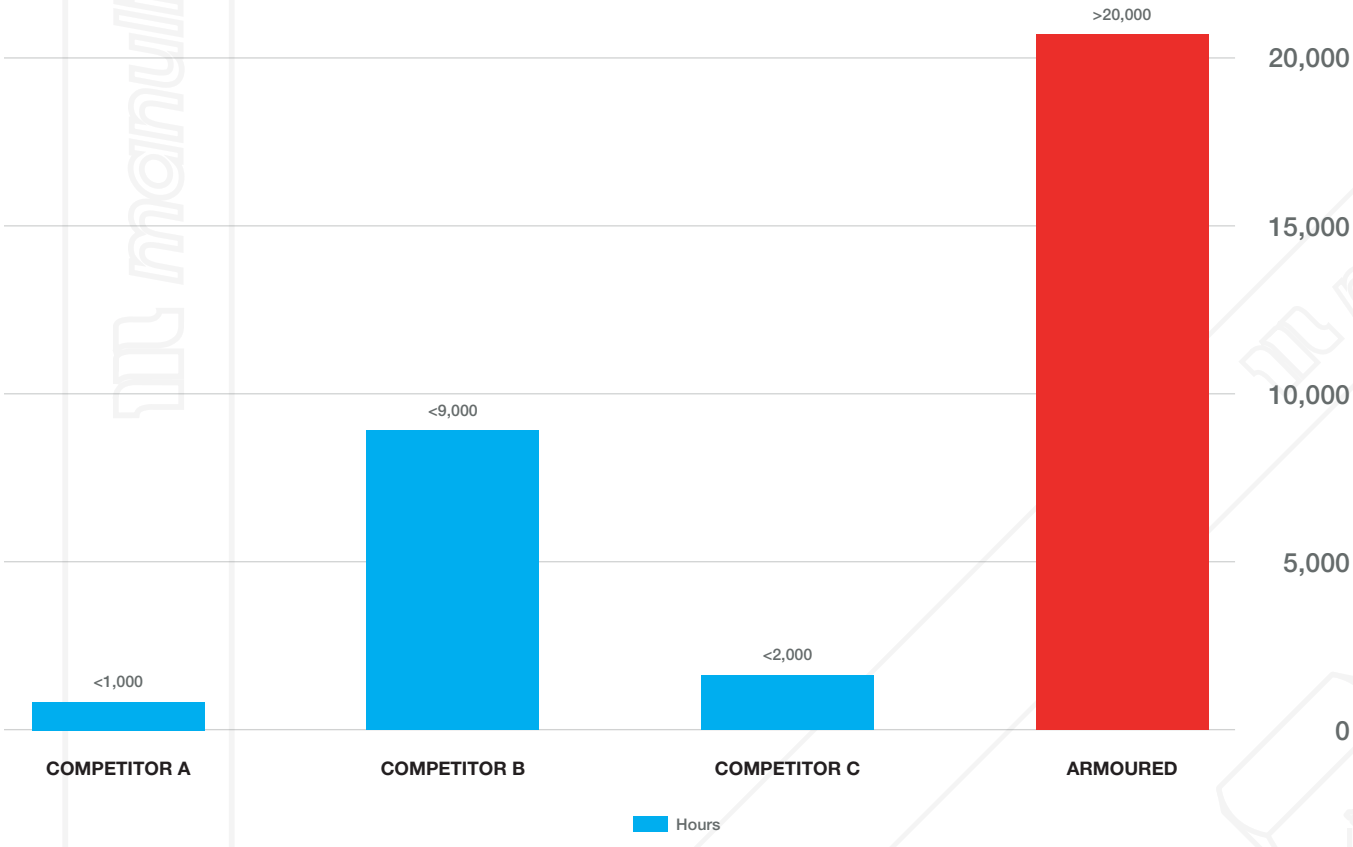
20,000 CYCLES (10KG)



60,000 CYCLES (10KG)

NUMBER OF CYCLES BEFORE REINFORCEMENT EXPOSURE

The graph below compares the number of abrasion cycles completed before the steel reinforcement became exposed during modified ISO 6945 testing.



Modified ISO 6945 Abrasion Test, 10kg vertical force

HOSE COVER TECHNOLOGIES

The specialised rubber compounds used in the ForeMaster hose covers reflect Manuli Hydraulics' ongoing focus on innovation and engineering excellence.

RUBBER OUTSTANDING COVER

Designed for exceptional abrasion and weather resistance in heavy duty applications, the Rubber Outstanding Cover (ROC) hose cover delivers durability that exceeds many conventional hose cover solutions.

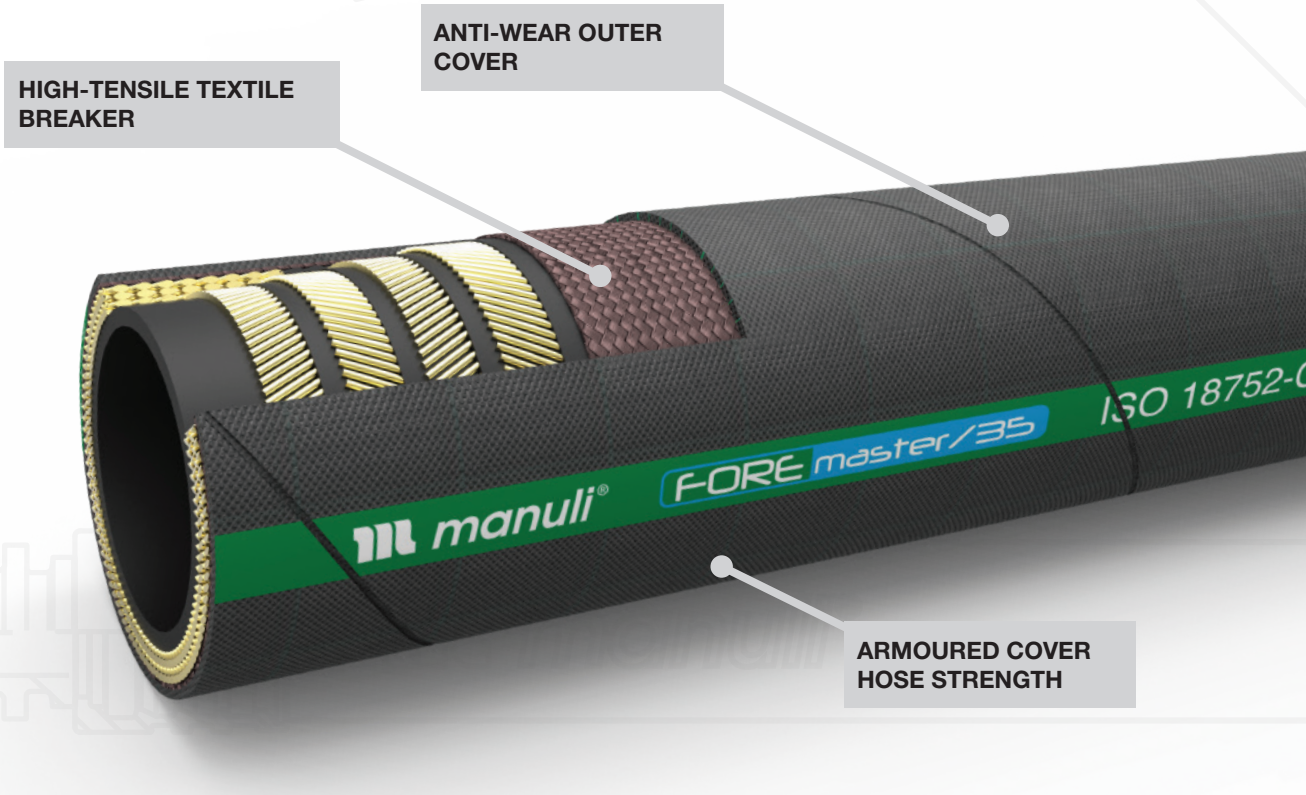
Available across the 21 MPa and 28 MPa hose families, and in smaller sizes (< DN19) within the 35 MPa and 42 MPa ranges, the ROC hose cover has proven its value in demanding operating environments. It delivers up to 600 hours of crack free performance in ISO 6945 ozone resistance testing and records only 0.03 g of weight loss in standard ISO 6945 abrasion tests with a 5 kg load. Combined with fire resistance, anti static properties, and reliable operation in very low temperatures, ROC is a versatile addition to the Manuli Hydraulics hose cover portfolio.

ARMOURED COVER

The Armoured Cover is the culmination of years of research and development into both hose structural design and rubber compound formulation. This innovative new cover concept is made up of two fundamental elements:

- **Outer Cover:** Proprietary anti wear rubber compound formulated to provide enhanced abrasion resistance.
- **Textile Breaker Layer:** High tensile textile reinforcement provides additional protection against external wear and damage.

The Armoured Cover is used on the 35 MPa and 42 MPa (≥ DN19) families of ForeMaster hoses and offers one of the highest levels of abrasion and scratch resistance available on the market today.



FOREMASTER/21

OUTSTANDING ABRASION RESISTANCE

FEATURES & BENEFITS:

- Extreme abrasion resistance.
- Impact and scratch resistant cover.
- Very low bend radius to suit restricted space installations.
- Highly robust and compact hose structure compared to rated pressure.
- High resistance to environmental agents.
- Vacuum resistance according to SAE 100R4 requirements.

APPLICATIONS & FLUIDS:

Low and medium pressure hydraulic lines with installation constraints, pilot lines, return, drain and suction lines.

Mineral oils, vegetable oils and synthetic ester based oils (up to 100°C / 212°F), glycols and polyglycols, mineral oils in aqueous emulsion, water.

PART REF.	HOSE SIZE			R.O.D		O.D		MAX. W.P		BURST		MIN. BEND		WEIGHT		FITTINGS	
	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	Std 1	Std 2
H01166A06*	6	-4	1/4"	10.2	0.40	12.0	0.47	210	3,040	840	12,180	50	1.97	177	0.12	MF+M00120-04	OPF-04
H01166A08*	8	-5	5/16"	11.5	0.45	13.6	0.54	210	3,040	840	12,180	55	2.17	207	0.14	MF+M00120-05	OPF-05
H01166A10*	10	-6	3/8"	14.4	0.57	16.4	0.65	210	3,040	840	12,180	65	2.56	301	0.20	MF+M00120-06	OPF-06
H01166A12*	12	-8	1/2"	18.1	0.71	20.3	0.80	210	3,040	840	12,180	90	3.54	441	0.30	MF+M00120-08	OPF-08
H01166A16*	16	-10	5/8"	22.2	0.87	24.2	0.95	210	3,040	840	12,180	100	3.94	616	0.41	MF+M00120-10	OPF-10
H01166A19*	19	-12	3/4"	25.6	1.01	27.7	1.09	210	3,040	840	12,180	120	4.72	761	0.51	MF+M00120-12	OPF-12
H01166A25*	25	-16	1"	33.0	1.30	35.2	1.39	210	3,040	840	12,180	150	5.91	1,172	0.79	MF+M00130-16	OPF-16

Refer to the latest Manuli Digital Crimp Tools for crimping parameters.

TECHNICAL SPECIFICATIONS:

Continuous Service Temperature Range

-46.0 °F, -50 °F
121°C, 250 °C

Tube

Oil resistant synthetic rubber.

Reinforcement

One wire braid (DN 6-12). Two wire braid (DN16-25).

Cover

R.O.C.
Synthetic rubber with extreme abrasion and ozone resistance.

Applicable Standards

ISO 18752-C; Exceeds SAE J517 Type 100R17 & ISO 11237-R17.

Type Approvals

MSHA

FOREMASTER/28

OUTSTANDING ABRASION RESISTANCE

FEATURES & BENEFITS:

- Extreme abrasion resistance.
- Impact and scratch resistant cover.
- Very low bend radius to suit restricted space installations.
- Highly robust and compact hose structure compared to rated pressure.
- High resistance to environmental agents.
- Vacuum resistance according to SAE 100R4 requirements.

APPLICATIONS & FLUIDS:

Low and medium pressure hydraulic lines with installation constraints, pilot lines, return, drain and suction lines.

Mineral oils, vegetable oils and synthetic ester based oils (up to 100°C / 212°F), glycols and polyglycols, mineral oils in aqueous emulsion, water.

PART REF.	HOSE SIZE			R.O.D		O.D		MAX. W.P		BURST		MIN. BEND		WEIGHT		FITTINGS	
	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	Std 1	Std 2
H01167A06*	6	-4	1/4"	11.6	0.46	13.2	0.52	280	4,060	1,120	16,240	50	1.97	254	0.17	MF+M00120-04	OPF-04
H01167A08*	8	-5	5/16"	12.9	0.51	14.5	0.57	280	4,060	1,120	16,240	55	2.17	279	0.19	MF+M00120-05	OPF-05
H01167A10*	10	-6	3/8"	15.4	0.61	17.0	0.67	280	4,060	1,120	16,240	63	2.48	374	0.25	MF+M00120-06	OPF-06
H01167A12*	12	-8	1/2"	18.5	0.73	20.3	0.80	280	4,060	1,120	16,240	80	3.15	488	0.33	MF+M00120-08	OPF-08
H01167A16*	16	-10	5/8"	22.7	0.89	24.7	0.97	280	4,060	1,120	16,240	90	3.54	719	0.48	MF+M00120-10	OPF-10
H01167A19*	19	-12	3/4"	27.1	1.07	29.3	1.15	280	4,060	1,120	16,240	120	4.72	1,040	0.70	MF+M00120-12	OPK-12

Refer to the latest Manuli Digital Crimp Tools for crimping parameters.

TECHNICAL SPECIFICATIONS:

Continuous Service Temperature Range

-46.0 °F, -50 °F
121°C, 250 °C

Tube

Oil resistant synthetic rubber.

Reinforcement

Two high tensile wire braids.

Cover

R.O.C.
Synthetic rubber with extreme abrasion and ozone resistance.

Applicable Standards

ISO 18752-C; Exceeds SAE J517 Type 100R17 & ISO 11237-R17.

Type Approvals

MSHA

FOREMASTER/35

OUTSTANDING ABRASION RESISTANCE

FEATURES & BENEFITS:

- Extremely high abrasion resistance, long life before reinforcement scratching.
- Special composite cover layer with textile reinforcement for maximum resistance in harsh environments.
- Very low bend radius to suit restricted space installations.
- High resistance to environmental agents.
- Good flexibility across the whole temperature range.
- Easy mounting in any installation.
- Highly robust and compact hose structure compared to rated pressure.
- High impulse resistance according to ISO 18752 requirements.

APPLICATIONS & FLUIDS:

High pressure power lines for general hydraulics.

Designed for forestry machines, booms and harvester heads, harsh environments and severe abrasion.

Mineral oils, vegetable oils and synthetic ester based oils (up to 100°C / 212°F), glycols and polyglycols, mineral oils in aqueous emulsion, water

PART REF.	HOSE SIZE			R.O.D		O.D		MAX. W.P		BURST		MIN. BEND		WEIGHT		FITTINGS	
	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	Std 1	Std 2
H10133010*	10	-6	3/8"	15.5	0.61	17.1	0.67	350	5,070	1,400	20,300	65	2.56	440	0.30	MF+M00120-06	
H10133012*	12	-8	1/2"	18.6	0.73	20.6	0.81	350	5,070	1,400	20,300	80	3.15	573	0.39	MF+M00120-08	
H10133019*	19	-12	3/4"	27.5	1.08	31.7	1.25	350	5,070	1,400	20,300	140	5.51	1,251	0.84	IP+M01500-12	SP+M05400-12
H10133025*	25	-16	1"	34.6	1.36	38.8	1.53	350	5,070	1,400	20,300	190	7.48	1,843	1.24	IP+M01500-16	SP+M05400-16
H10133031*	31	-20	1.1/4"	42.1	1.66	47.1	1.85	350	5,070	1,400	20,300	230	9.06	2,484	1.67	IP+M01500-20	
H10133038*	38	-24	1.1/2"	52.9	2.08	57.9	2.28	350	5,070	1,400	20,300	300	11.81	4,268	2.87	IP+M01600-24	
H10133051*	51	-32	2"	66.8	2.63	72.2	2.84	350	5,070	1,400	20,300	360	14.17	6,278	4.22	IP+M01800-32	

Refer to the latest Manuli Digital Crimp Tools for crimping parameters.

TECHNICAL SPECIFICATIONS:

Continuous Service Temperature Range

-46.0 °F, -50 °F
121°C, 250 °C

Tube

Oil resistant synthetic rubber.

Reinforcement

Four high tensile steel spirals.

Type Approvals

MSHA; CU-TR

Cover

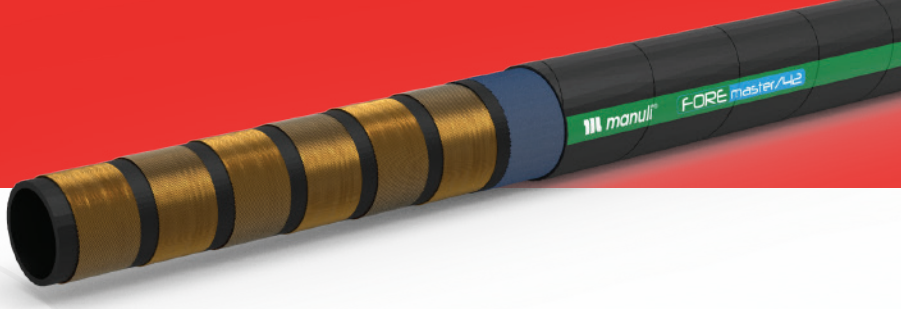
DN 10–12 – R.O.C.
Synthetic rubber with extreme abrasion and ozone resistance.
DN 19 and larger – ARMOURED
Synthetic rubber composite cover with textile reinforcement, high abrasion and very high scratch resistance.

Applicable Standards

Manuli® Design, ref. ISO 18752-C

FOREMASTER/4

OUTSTANDING ABRASION RESISTANCE



FEATURES & BENEFITS:

- Extremely high abrasion resistance, long life before reinforcement scratching.
- Special composite cover layer with textile reinforcement for maximum resistance in harsh environments.
- Very low bend radius to suit restricted space installations.
- High resistance to environmental agents.
- Good flexibility across the whole temperature range.
- Easy mounting in any installation.
- Highly robust and compact hose structure compared to rated pressure.
- High impulse resistance according to ISO 18752 requirements.

APPLICATIONS & FLUIDS:

High pressure power lines for general hydraulics.

Designed for forestry machines, booms and harvester heads, harsh environments and severe abrasion.

Mineral oils, vegetable oils and synthetic ester based oils (up to 100°C / 212°F), glycols and polyglycols, mineral oils in aqueous emulsion, water

PART REF.	HOSE SIZE			R.O.D		O.D		MAX. W.P		BURST		MIN. BEND		WEIGHT		FITTINGS	
	DN	dash	inch	mm	inch	mm	inch	bar	psi	bar	psi	mm	inch	g/m	lb/ft	Std 1	Std 2
H10134006*	6	-4	1/4"	11.3	0.44	13.1	0.51	420	6,090	1,680	24,360	45	1.77	284	0.19		
H10134010*	10	-6	3/8"	17.6	0.69	20.0	0.78	420	6,090	1,680	24,360	100	3.93	684	0.46	MF+M00910-06	
H10134012*	12	-8	1/2"	20.3	0.79	22.7	0.89	420	6,090	1,680	24,360	120	4.72	797	0.54	MF+M00910-08	
H10134016*	16	-10	5/8"	23.9	0.94	26.4	1.03	420	6,090	1,680	24,360	140	5.51	982	0.66	MF+M01500-10	
H10134019*	19	-12	3/4"	27.7	1.09	31.9	1.26	420	6,090	1,680	24,360	150	5.91	1,356	0.91	IP+M01500-12	
H10134025*	25	-16	1"	34.8	1.37	39.0	1.54	420	6,090	1,680	24,360	210	8.27	2,079	1.40	IP+M01500-16	
H10134031*	31	-20	1.1/4"	42.2	1.66	46.5	1.83	420	6,090	1,680	24,360	260	10.24	2,474	1.66	IP+M01500-20	
H10134038*	38	-24	1.1/2"	53.2	2.09	58.2	2.29	420	6,090	1,680	24,360	310	12.20	4,536	1.40	IP+M01600-24	
H10134051*	51	-32	2"	68.9	2.71	73.5	2.89	420	6,090	1,680	24,360	500	19.69	7,325	4.92	IS+M02700-32	SPGX-+M05500-32GX

Refer to the latest Manuli Digital Crimp Tools for crimping parameters.

TECHNICAL SPECIFICATIONS:

Continuous Service Temperature Range

-46.0 °F, -50 °F
121°C, 250 °C

Tube

Oil resistant synthetic rubber.

Reinforcement

Four high tensile steel spirals.

Type Approvals

MSHA; CU-TR

Cover

DN 10–12 – R.O.C.
Synthetic rubber with extreme abrasion and ozone resistance.
DN 19 and larger – ARMOURED
Synthetic rubber composite cover with textile reinforcement, high abrasion and very high scratch resistance.

Applicable Standards

Manuli® Design, ref. ISO 18752-C

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