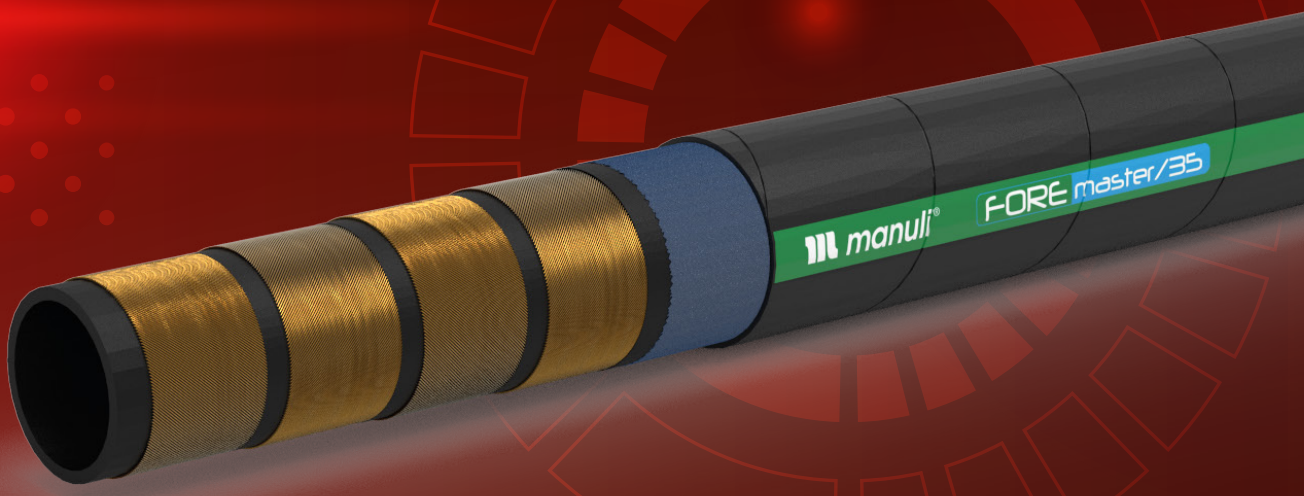
FORE master

AT THE FOREFRONT OF HYDRAULICS EXCELLENCE



manuli®
HYDRAULICS HP

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. To 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

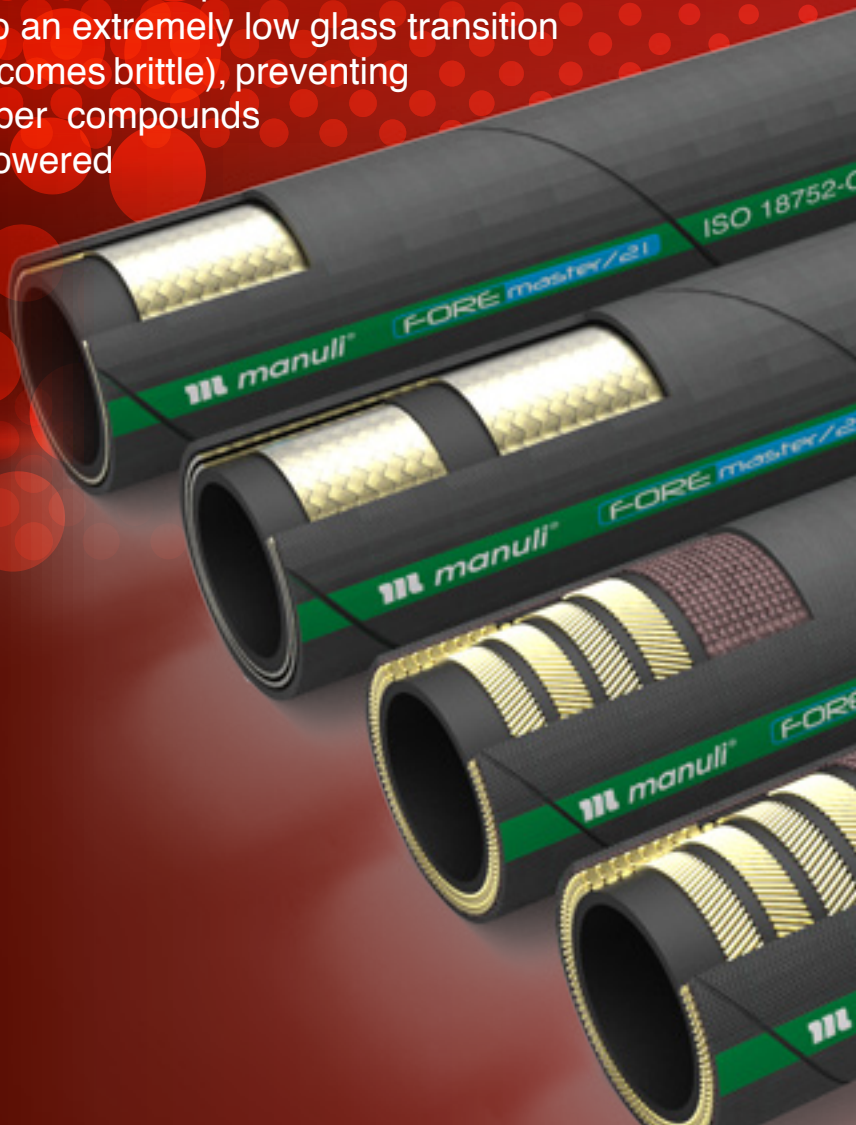
Comprising four isobaric pressure ratings, the ForeMaster range offers long lasting resistance to pressure impulse cycles (according to ISO 18752 Grade C), whilst simultaneously providing some of the highest impact and abrasion resistance available for a rubber-covered hose on the market today. With 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

The rubber outer cover on ForeMaster hoses has also been specially formulated to resist extremes of temperature. This is especially useful in industries where daily operating conditions fall well below freezing. 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

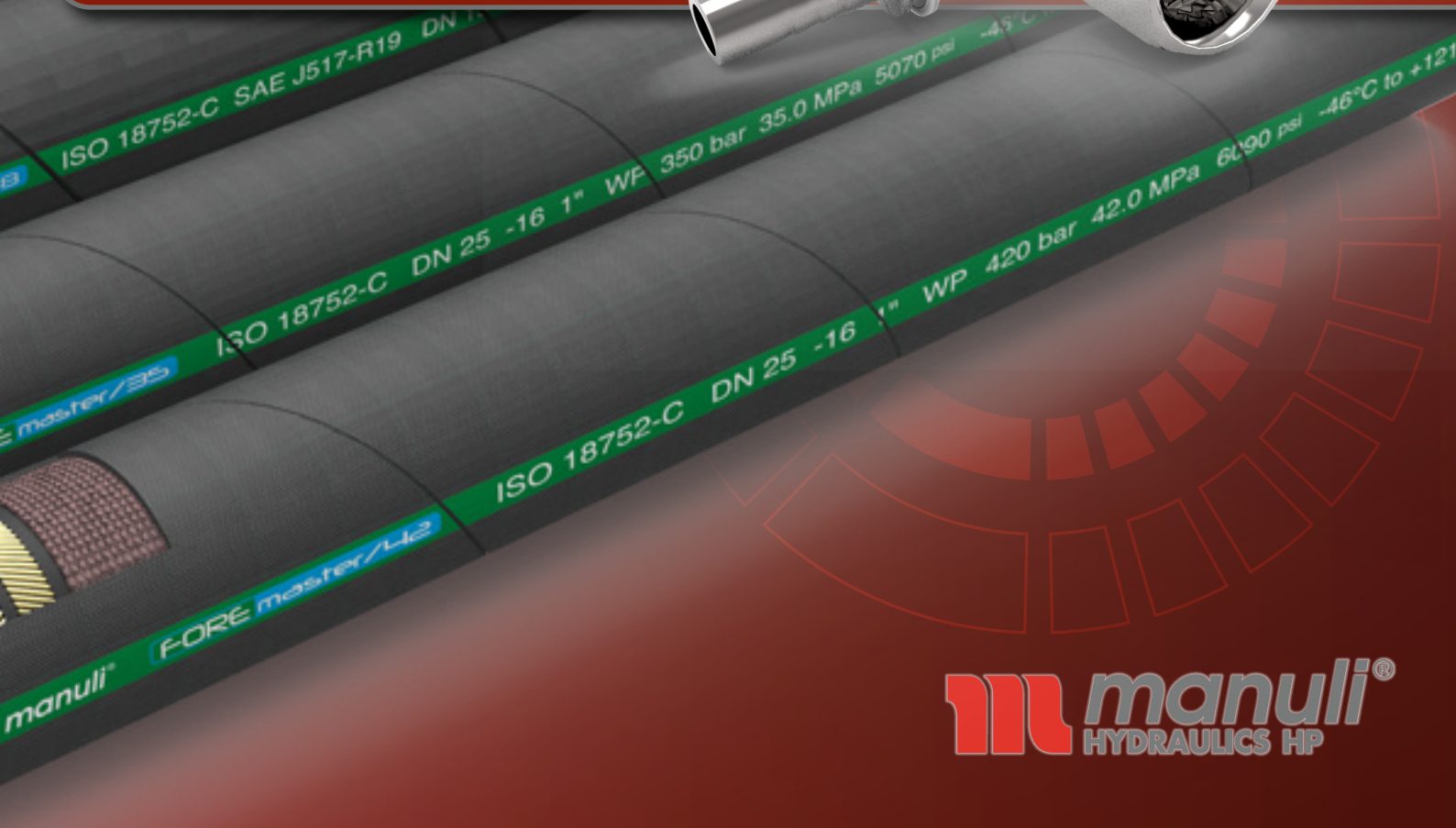
The one-piece, no-skive alternative solution for the two lower pressure families. Reliable, hassle-free and easy to fit in after-market maintenance situations.

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.



manuli® HYDRAULICS HP

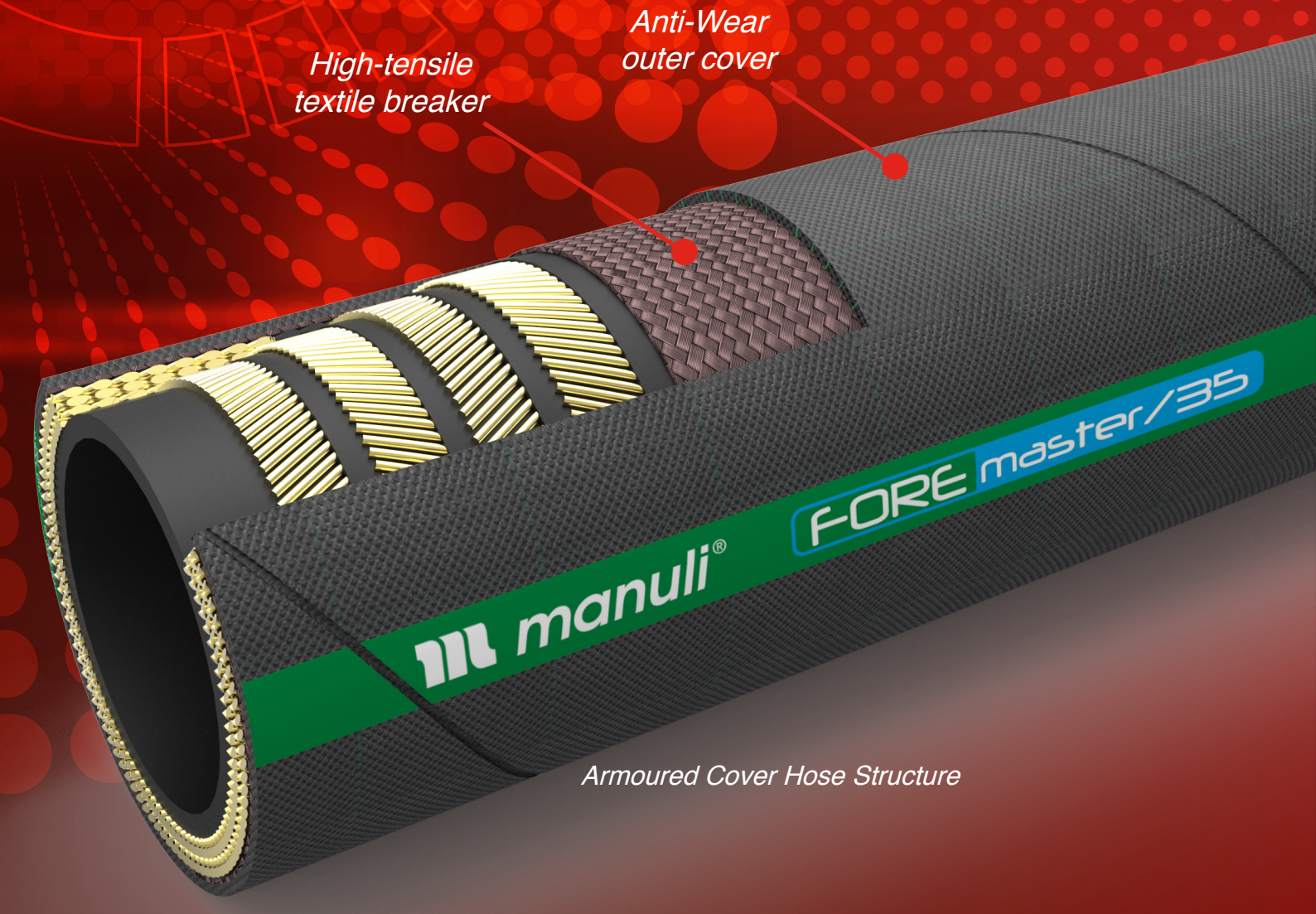
HOSE COVER TECHNOLOGIES

Manuli Hydraulics is always at the leading edge when it comes to innovation and technical development, and the rubber compounds used for the hose covers in the ForeMaster range are just one example of this.

RUBBER OUTSTANDING COVER – ROC

Specifically designed for extreme abrasion and weathering resistance on heavy duty hoses, the ROC hose cover solution easily out-performs all but the toughest and most resilient hose cover solutions.

Used on the 21 MPa and 28 MPa hose families and on small sizes (< DN19) for 35 MPa and 42 MPa hoses within the ForeMaster range, the ROC hose cover solution has already proven itself to be a superb investment for use in the harshest of environmental conditions. The ROC hose cover solution provides up to 600 hours of crack-free operation in ISO 6945 ozone resistance tests, and loses only 0.03g of weight in standard ISO 6945 abrasion tests with a 5kg load. In addition, a high fire and anti-static resistance coupled with an ability to function at very low temperatures, makes the ROC hose cover solution a highly versatile addition to the Manuli Hydraulics cover solutions range.



Armoured Cover Hose Structure

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 made from a proprietary, specially formulated anti-wear rubber compound
- High-tensile textile breaker layer

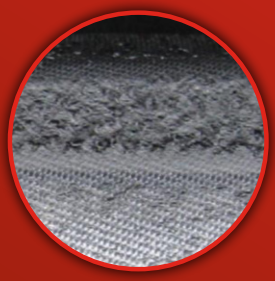
The Armoured Cover is used on the 35 MPa and 42 MPa (≥ DN 19) families of ForeMaster hoses and offers one of the highest levels of abrasion and scratch resistance available on the market today.

PUTTING IT TO THE TEST

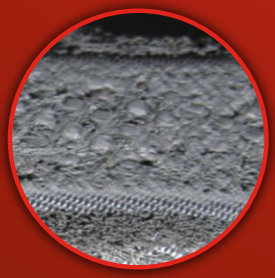
In standard ISO 6945 abrasion tests a reciprocating 5kg load is used to create wear on the hose cover. The test lasts for 2,000 cycles and measures the mass of material lost. The lower the result, the better the performance.

However, to truly test the performance of the Armoured Cover, Manuli devised a more severe test. A 10kg reciprocating load was used, and the number of cycles required to expose the steel reinforcement was determined. In this case, the higher the result, the better the performance.

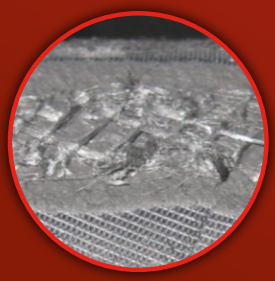
Whilst hoses with the Armoured Cover performed up to 4 times better than the competition in standard ISO 6945 abrasion tests, they lasted as much as 30 times longer before the steel reinforcement was exposed.



2,000 cycles (10kg)

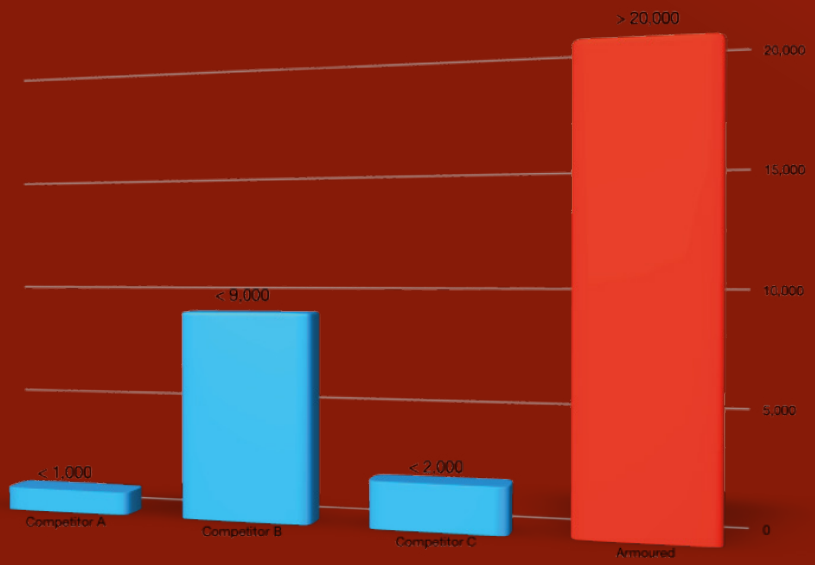


20,000 cycles (10kg)



60,000 cycles (10kg)

Number of Cycles Before Reinforcement Exposure

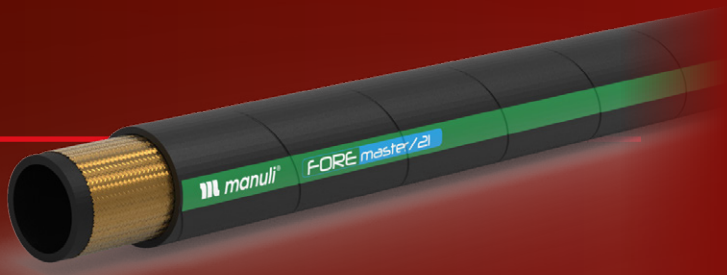


Modified ISO 6945 Abrasion Test, 10kg vertical force

manuli® HYDRAULICS HP

FOREMASTER/21

OUTSTANDING ABRASION RESISTANCE



TECHNICAL DATA

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

KEY FEATURES

- 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

CONTINUOUS SERVICE TEMPERATURE RANGE

-46 °C, -50 °F

121 °C, 250 °F

TUBE

Oil resistant synthetic rubber

REINFORCEMENT

One wire braid (DN 6-12). Two wire braid (DN 16-25)

COVER

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

APPLICABLE SPECS

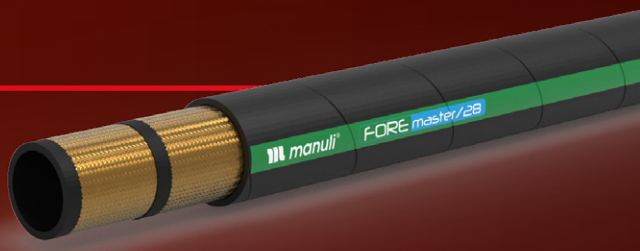
ISO 18752-C; Exceeds SAE J517 Type 100R17 & ISO 11237-R17

TYPE APPROVALS

MSHA

FOREMASTER/28

OUTSTANDING ABRASION RESISTANCE



TECHNICAL DATA

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

KEY FEATURES

- 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

- Medium and high 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

CONTINUOUS SERVICE TEMPERATURE RANGE

-46 °C, -50 °F

121 °C, 250 °F

TUBE

Oil resistant synthetic rubber

REINFORCEMENT

Two high tensile wire braids

COVER

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

APPLICABLE SPECS

ISO 18752-C; Exceeds SAE J517 Type 100R19 & ISO 11237-R19

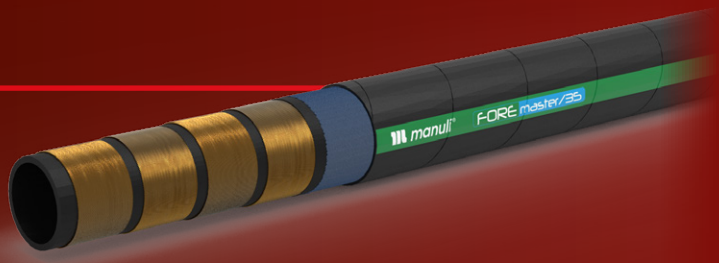
TYPE APPROVALS

MSHA

manuli® HYDRAULICS HP

FOREMASTER/35

EXTREME SCRATCHING RESISTANCE



TECHNICAL DATA

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	

KEY FEATURES

- 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
- Good flexibility across the whole temperature range
- Easy mounting in any installation
- Highly robust and compact hose structure compared to rated pressure
- High resistance to environmental agents
- 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

CONTINUOUS SERVICE TEMPERATURE RANGE

-46 °C, -50 °F

121 °C, 250 °F

TUBE

Oil resistant synthetic rubber

REINFORCEMENT

Four high tensile steel spirals

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 SPECS

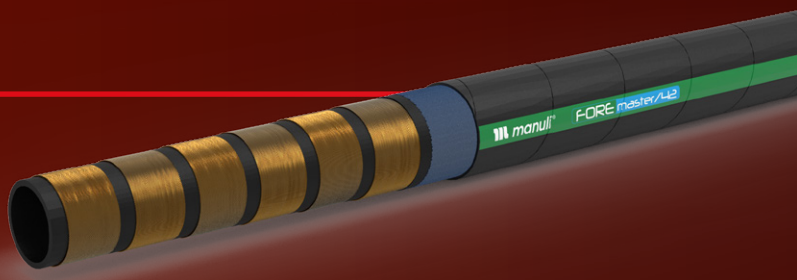
Manuli® Design, ref. ISO 18752-C

TYPE APPROVALS

MSHA; CU-TR

FOREMASTER/42

EXTREME SCRATCHING RESISTANCE



TECHNICAL DATA

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

KEY FEATURES

- Extremely high abrasion resistance, long life before reinforcement scratching
- Special composite cover layer with textile reinforcement for maximum resistance in harsh environments
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- Good flexibility across the whole temperature range
- Easy mounting in any installation
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- 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

CONTINUOUS SERVICE TEMPERATURE RANGE

-46 °C, -50 °F

121 °C, 250 °F

TUBE

Oil resistant synthetic rubber

REINFORCEMENT

Four high tensile steel spirals

COVER

DN 6-16 - 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 SPECS

Manuli® Design, ref. ISO 18752-C

TYPE APPROVALS

MSHA; CU-TR

manuli® HYDRAULICS HP

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