

FLUID COMPATIBILITY CHART

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in personal injury or property damage.

HOSE SELECTION BY MEDIUM AND HOSE TYPE

This hose compatibility chart is a reference of Manuli Hydraulics hose compatibility with various fluid media. It is intended as a guide to chemical compatibility with inner tube materials and assembly lubricants applied internally to the hose. The Fluid Compatibility Chart lists the relative resistance of hose tube and fitting materials to more common:

- **hydraulic oils**
- **other diversified oils families (for hydrokinetic and lubrication applications)**
- **chemicals**

in three relative separated charts.

The ratings shown do not cover all possible variations of all factors, such as temperature, concentration, degradation or fluid contamination, etc. Testing under actual conditions is the best way to assure chemical compatibility for critical applications.

PART 1: HYDROSTATIC OILS COMPATIBILITY CHART (ACTUAL HYDRAULIC SYSTEMS AND APPLICATIONS)

The specific recommendations regarding **hydraulic fluids** are based upon specific laboratory bench tests with fluids, performed according to ISO 1817 and internal methodology, integrated with field experiences and the advices of various polymers or fluid suppliers. **It must be stressed, however, that this information is offered only as a guide and is not a guarantee.** Final hose selection also depends upon pressure, fluid and ambient temperatures, concentration, duration of exposure and special requirements or variations, which may not be known by Manuli Hydraulics. Legal and other regulations must be followed with particular attention.

All the combined factors in working operations may impact on the service life of the hose assembly and must be carefully considered before releasing a hose for a specific application: the chemical compatibility with the service fluid is only one of the factors to be considered.

It is always recommended to test the specific fluid brand name with the requested hose, in order to verify chemical compatibility. Manuli Hydraulics constantly performs compatibility tests as service to market, progressively updating the compatibility chart.

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

PART 2: HYDROKINETIC APPLICATIONS AND LUBRICANT OILS COMPATIBILITY CHART (AUTOMATED TRANSMISSIONS AND VARIOUS LUBRICATION SYSTEMS)

This second part of the compatibility chart list a particular family of oils, not designed for standard hydraulics (hydrostatic applications), rather studied for many diversified applications such as lubrication for gear, compressors, turbines, diathermic oils for cooling or heat transmission, and ATF (Automatic Transmission Fluids) oils for the hydrokinetic (hydrodynamic) applications. These fluids are often very aggressive on traditional tube rubbers, more than hydraulic oils, due to the nature of the fluids and additives, aimed to give properties of long life duration and high temperature resistance; that's why their chemical compatibility with tube rubbers must be carefully checked before eventual use.

It is to be underlined that Manuli hoses are designed in principle for use with hydraulic oils only, and that diversified applications such as the ones with these categories of other oils, must be verified case by case with lab and/or field tests by users under their sole and exclusive responsibility and no liability whatsoever can be attributed to Manuli Hydraulics in that regard.

For more detailed information contact Manuli Hydraulics or visit www.manuli-hydraulics.com

PART 3: BEHAVIOUR TO CHEMICALS (GUIDELINES FROM LITERATURE) FOR NON-HYDRAULIC APPLICATIONS

WARNING: Manuli hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals.

The recommendations regarding **generic chemicals** are mainly based on literature data in conjunction with polymers used for the tube compound. The field results of the fluid conveyed in the hose should be carefully tested and field validated by users.

No test on finished hose assemblies in combination with the mentioned chemicals has been normally performed.

The possible good rating and on field performance of the hose with a chemical mentioned in the list does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals.

The outer cover of the hose is intended to protect the reinforcement layer(s) from mechanical influences (abrasion, weathering etc.); cover compounds are not designed to exhibit the same chemical resistance as the tube compounds. Manuli Hydraulics should be consulted about the compatibility of the cover, should the application involve the extended exposure or immersion in a liquid: **anyway the hydraulic hoses of the Manuli Hydraulics product range are not designed in general for immersion in the service fluid.**

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

This type of special applications should be avoided or carefully studied with additional external protections for the hoses, selection of special hose types, e.g. with thermoplastic cover and validation on the specific application. The turbulence of the fluid, the high temperature and nature of the fluid as well as other elements may impact the properties or integrity of the hose cover material (the cover compound of the hose is designed to resist to oil drops and external agents, not immersion in the service fluid).

For more detailed information contact Manuli Hydraulics or visit www.manuli-hydraulics.com

WARNING: No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed. The possible good rating and on field performance of the hose with a chemical mentioned in the list, does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals. No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed.

LEGEND OF HOSE TYPES BY TUBE COMPOUNDS

Tube compound categories	Hose Types
NITRILE	std wire braid, textile braid & wire spiral hoses (Tractor, Harvester, Lyteflex, Firend, Goldenspir, Astro, Multitex, Pushfit, Cover, Spirtex/K, Rockmaster, Shieldmaster, Twinpower, GoldenISO, Goldenguard, Diamondspir, Xtraflow/4WS & 2WB, Pilot, Jackmaster)
CHLOROPRENE	Eternity/2, Nozone/2K, Goldenblast
CHLOROSULPHONATED POLYETHYLENE	Equator/1 (Blue & Black), Equator/2 (Blue & Black), Xtraflow/HT
CHLORINATED POLYETHELENE	Mastertex
POLYESTER	Hydroplast, Hydrotwin

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HOW TO USE THE CHART

- Hydraulic fluids are listed in alphabetic order with the manufacturer brand name and ISO identification symbol (DIN when available), chemicals are listed alphabetically;
- Find the hose type and read the compatibility rating (see rating scale);
- Define the proper hose selection for the application by choosing the best rating.

LEGEND OF RATINGS

E = Excellent - Small or negligible changes of compound properties: no problem for use. Service life can exceed the expectations.

G = Good - There are only minor changes of some compound properties. Service life is normally in line with state of the art (standard) expectations.

C = Conditional - Significant changes on some compound properties. Service life can be reduced; higher durability can be achieved with reduced severity of working conditions (temperature in particular) or with an upgraded hose selection. Whenever possible, a field validation under actual working conditions is recommended.

X = Not recommended - Unsuitable, severe effects on physical properties.

REMARKS

- O-Rings used with couplings must also be considered for chemical compatibility with the fluid to be conveyed. This includes fittings containing internal O-Rings; for example Metric Female 24° Cone seat fittings, etc. Standard O-Ring of Manuli Hydraulics fittings are made of Nitrile rubber (NBR), highly chemically compatible with all hydraulic fluids. If you use special fluids or very high temperatures, different O-Ring materials should be used, contact Manuli Hydraulics for specific information. See Technical Manual for dimensions of O-Rings.
- Compatibility of hose fittings with conveyed fluids is an essential factor in avoiding chemical reactions that may result in release of fluids and failure of the connection with the potential of causing severe personal injury or property damage. Standard Manuli Hydraulics fittings are made of carbon steel with Hexavalent chromium free plating.

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

OILS CLASSIFICATION - ACCORDING TO ISO 6743-4

ISO 6743-4 is an important norm regarding "Lubricants, industrial oils and related products (class L)". The norm defines a very wide family of oils, used in many different sectors and applications.

The oils must be carefully understood and properly managed to avoid problems and possible mistakes. The Part 4 of the norm in particular regards the Hydraulic Oils (Family H), for hydrostatic and hydrokinematic applications, the other parts of the norm regard other fluids, of different nature or aimed to different applications than hydraulics.

Manuli Hydraulics hoses are designed and qualified for use with Hydraulic Oils (Family H of the ISO 6743-4), and the behaviour of the particular oil formulation has to be verified case by case.

The applications with oils of the families different than H must be checked carefully but in principle Manuli Hydraulics hoses are not designed for use with them.

Here below the classification of oils by ISO 6743 spec.

Part 1: Family A (Total Loss systems)

Part 2: Family F (Spindle bearings, bearings and associated clutches)

Part 3A: Family D (Compressors)

Part 3B: Family D (Gas and refrigeration compressors)

Part 4: Family H (Hydraulic Systems)

Part 5: Family T (Turbines)

Part 6: Family C (Gears)

Part 7: Family M (Metalworking)

Part 8: Family R (Temporary protection against corrosion)

Part 9: Family X (Greases)

Part 10: Family Y (Miscellaneous)

Part 11: Family P (Pneumatic tools)

Part 12: Family Q (Heat Transfer Fluids)

Part 13: Family G (Slideways)

Part 14: Family U (Heat treatment)

Part 15: Family E (Internal combustion engines)

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

The Family H in particular, object of use with Manuli Hydraulics hoses is composed by the following families of oils, identified by ISO dedicated symbols, used also in the compatibility chart.

General application	Particular application	More specific applications	Composition and properties	Symbol ISO-L
HYDRAULIC SYSTEMS	HYDROSTATIC APPLICATIONS	(std hydraulic applications)	Non-inhibited refined mineral oils	HH
			Refined mineral oils with improved anti-rust and anti-oxidation properties	HL
			Oils of HL type with improved anti-wear properties	HM
			Oils of HL type with improved viscosity/temperature properties	HR
			Oils of HM type with improved viscosity/temperature properties	HV
			Synthetic fluids with no specific fire resistant properties	HS
		Applications where environmentally acceptable fluids are requested	Triglycerides	HETG
			Polyglycols	HEPG
			Synthetic esters	HEES
			Polyalpaoelefin and related hydrocarbon products	HEPR
		Hydraulic slide-way systems	Oils of HM tyoe with anti-stick/slip properties	HG
		Applications where fire resistant fluids are required	Oils in water emulsion	HFAE
			Chemical solution in water	HFAS
			Water in oil emulsion	HFB
			Water polymer soultions	HFC
			Synthetic fluids containing no water and consisting of phosphate esters	HFDR
			Synthetic fluids containing no water and of other composition	HFDU
		HYDROKINETIC APPLICATIONS	Automatic transmissions	(ATF oils)
	Couplers and converters		HN	

- XXXX
 Generally good compatibility with hoses, anyway the behaviour of the particular oil formation to be verified case by case
- HA & HN
 ATF oils, chemical compatibility with hoses to be carefully verified case by case upon request and application
- HFAS & HFDR
 No compatibility with Manuli Hydraulics hoses. Dedicated hoses are requested

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

PART 1: HYDROSTATIC APPLICATION OILS COMPATIBILITY CHART

(ACTUAL HYDRAULIC SYSTEMS AND APPLICATIONS)

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
ACT Ecosafe FR 46	HFDU	-	E	E	C	-	C	G	-
ACT FR WG 200 D	HFC	-	E	X	E	-	X	E	-
ADDINOL Ökosynth Super HEES 46	HEES	-	G	C	G	-	C	G	-
ADDINOL Ökosynth Super HEES 46 S	HEES	-	G	C	G	G	C	G	-
AGIP Arnica 46	HV	HVLP	E	G	G	G	E	G	-
AGIP Arnica Extra Plus	HEES	HVLP	G	G	G	G	C	G	E
AGIP Arnica Plus	HEES	HVLP	E	E	G	G	C	E	E
AGIP Arnica S46	HFDU	-	E	E	G	G	C	E	E
AGIP Oso 32	HM	HLP	E	E	G	-	E	E	G
AGIP Oso 46 S	HM	HLP	E	G	G	G	G	G	G
AGIP Oso D 46	HM	HLPD	G	G	C	E	G	G	-
AGROL Mendo 46 G4	HEES	-	-	C	-	-	C	-	-
AKZO Fyrquel	HFDR	-	X	X	X	X	-	X	-
AMBRA Hitech 46	HL	HLP	E	E	G	-	G	E	G
ANDEROL 8768 (PAO)	HEPR	-	G	G	C	G	C	G	-
API HS 46	HV	HVLP	E	G	G	-	E	-	-
ARAL Vitam EHF 46	HEES	-	E	E	G	-	G	G	G
ARAL Vitam GF 68	HL	HLP	E	E	E	-	E	E	E
AVIA Avilub HLP 46	HM	HLP	G	G	G	G	E	G	-
AVIA Avilub SF 568	HM	HLP	-	-	-	-	G	-	-
AVIA Biofluid BP 32	HEES	-	G	C	G	E	X	G	-

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
AVIA Fluid RSL 32	HM	HLP	E	G	G	-	-	-	-
AVIA Fluid RSL 68	HM	HLP	G	G	G	G	E	G	-
AVIA HVI 46	HV	HVLP	G	G	G	-	E	G	-
AVIA Syntofluid F 46	HEES	-	E	G	E	-	G	G	E
AVIA Syntofluid N 32	HEES	-	G	G	E	G	G	E	G
AVIA Syntofluid N 46	HEES	-	E	E	G	-	G	E	G
AVIA Syntofluid PE B 30 (PAO)	HEPR	-	E	G	G	G	G	G	G
AVIA Syntofluid PE B 50 (PAO)	HEPR	-	E	E	G	G	G	G	-
BECEM Hydrostar PM 46	HH	-	E	E	G	-	G	E	-
BINOL Hydrap 46	HETG	-	E	E	G	G	-	G	-
BP A 0629L/028	HS	-	G	C	G	G	E	G	G
BP Bartran HV	HV	HVLP	E	G	G	G	E	G	-
BP Biohyd SE-S 46	HEES	-	G	G	E	-	C	E	-
BP Energol HLP 46	HL	HLP	G	G	G	-	-	-	-
BREMER Rivolta SBH 23	HEES	-	E	G	E	G	G	G	E
CALTEX Rando DSZ 46	HV	HVLP	G	G	C	-	G	C	-
CALTEX Rando HD	HM	HLP	E	G	G	G	G	G	G
CALTEX Rando HD LVZ 46	HV	HVLP	G	G	C	G	G	C	-
CASTROL Aero HF 585 B (MIL 56006H)	HH	HL	E	C	G	-	C	E	C
CASTROL Anvol SWX 68 (POE based)	HFDU	-	E	C	E	-	C	G	-
CASTROL Biobar VG 68	HEES	-	E	C	E	E	X	G	-
CASTROL Biotech Alpin 22	HETG	-	E	E	E	-	C	E	-
CASTROL Brayco 717 (MIL 17111c)	HS	-	G	C	G	-	C	G	G
CASTROL Brayco Micronic 882	HH	HL	G	G	G	G	G	G	G

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
CASTROL Carelube HTG	HETG	-	E	C	E	-	C	E	G
CASTROL Carelube HY 46	HEES	-	G	G	G	-	C	G	G
CASTROL Hyspin HDH 7000	HM	-	E	G	G	-	E	E	-
CASTROL Hyspin ZZ32	HM	HLP	G	G	G	G	E	G	G
CASTROL Lift oil	HH	HL	G	G	G	G	G	G	G
CASTROL Product L 320	HFDU	-	E	G	G	-	X	G	
CASTROL Product L 571	HH	HL	E	G	G	G	X	G	-
CENEX Indol Premium AW 4646	HM	HLP	G	E	G	G	-	G	-
CEPSA Hidraulico HM 46	HM	HLP	E	E	G	-	E	G	E
CHEVRON ETL 10328	HV	HVLP	G	E	C	G	G	G	-
CHEVRON Extra Hyd oil VG 46	HM	-	G	G	G	G	C	-	-
CHEVRON Hydraulic AW 46	HM	HLP	E	G	G	-	E	G	-
CHEVRON Machine oil AW 220	HV	HLP	G	G	G	-	G	G	G
CHEVRON Machine oil AW ISO 46	HV	HLP	G	G	G	-	G	G	G
CHEVRON Rando HD 68	HM	HLP	G	G	G	G	G	G	-
CHEVRON Rycon MV	HM	-	E	G	G	-	G	G	-
COAST OIL A/W 68	HM	-	G	G	C	-	G	-	-
CONDAT D 46	HFDU	-	E	C	G	-	C	G	-
CONOCO Ecoterra	HM	HLP	G	G	-	G	-	-	-
DEA Econa E 46	HEES	-	G	C	E	G	C	E	E
DOT 3	HPG	-	-	-	X	-	X	X	G
DOT 4	HPG	-	-	-	X	-	X	X	G
ELAN Hydraulic 46	HV	HVLP	E	G	G	-	E	G	G
ESSO Hidraulikoel HE 46	HEES	-	E	E	E	-	G	E	E
ESSO Nuto H46	HM	HLP	G	G	G	-	E	G	E

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
EXXON HUMBLE H 46	HM	HLP	E	G	G	-	E	G	-
EXXON RL 002775B	HM	-	G	G	C	G	C	-	-
EXXON Univis N46	HV	HVLP	E	G	G	G	E	G	-
FINKE Aviaticon HY HE	HEES	-	G	G	E	-	-	E	G
FOLTZERMSPRINGOLI Hydra 46	HH	-	G	G	G	G	E	G	-
FRAGOL HE 46	HEES	-	E	C	G	-	C	G	E
FUCHS Eco Hyd 46S NWG	HEES	-	G	C	G	-	X	G	-
FUCHS OM 13	HH	HL	G	G	G	-	G	E	E
FUCHS OM 65	HH	HL	G	G	G	-	-	G	G
FUCHS Plantohyd S 46	HEES	-	E	C	E	-	C	E	E
FUCHS Plantohyd N 46	HETG	-	G	C	E	G	C	E	E
FUCHS Plantohyd SUPER S46	HEES	-	G	X	E	G	X	-	-
FUCHS Plantosyn 3268 Eco	HEES	-	G	C	E	-	G	E	G
FUCHS Plantosyn 46 HVI	HEES	-	E	C	G	-	C	G	G
FUCHS RENOLIN B 46 HVI	HV	HVLP	E	G	G	-	E	G	G
FUCHS Renolin B15 VG46	HM	HVLP'	G	G	G	-	-	-	-
FUCHS Renolin D15 VG 46	HM	HLPD	E	G	G	G	-	G	-
FUCHS Renolin MR 520	HV	HVLPD	G	G	G	-	G	E	E
GULF Armony AW 46	HM	HLP	E	E	G	-	E	G	E
HOUGHTON Cosmolubric HF 130 (POE based)	HFDU	-	G	G	G	-	C	G	-
HOUGHTON Hydravis BC 84005 (60°C)	HFA	-	E	G	E	-	C	E	E
HOUGHTON Isocore E 68 plus	HFC	-	E	G	E	-	C	G	-
HOUGHTON Safe 620	HFC	-	G	G	G	-	X	-	-
HOUGHTON Safe OX 40	HFC	-	E	G	E	-	C	E	E
HOUGHTON Vital fluid L46AL	HFDU	-	G	G	E	-	C	-	-

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
HOUGHTON-Safe 273 CTF	HFC	-	E	C	E	-	X	E	E
IDEMITSU Daphne 46	HM	HLP	G	G	G	G	G	G	-
IGOL Matic ZNS 46	HV	-	E	G	G	-	E	-	-
IGOL Ticma Fluid	HV	-	E	G	G	-	E	G	-
IGOL Ticma Fluid BIO 46	HEES	-	G	G	G	-	C	G	-
INGERSOLL RAND SSR Ultracoolant (Polyglycole comp. coolant)	HEPG	-	G	G	G	-	G	G	-
INGERSOLL RAND Techtrol Gold(Polyglycole comp. coolant)	HEPG	-	G	C	G	-	G	G	-
IRVING hydraulic 46	HM	HLP	G	G	G	-	E	G	-
JIANGSU GAOKE L-HM32	HM	HLP	-	-	G	-	E	-	-
JOHN DEERE Bio Guard II	HETG	-	E	E	E	-	E	G	G
KLUBER Hysyn FG46	HS	-	G	G	C	-	G	C	-
KLUBER KluberBIO LR 9 68	HEES	-	E	C	G	G	X	G	-
KLUBERFOOD 4 NH1 46	HM	HLP	G	C	C	-	C	C	-
KOMATSU Genuine Bio 46 G4	HEES	-	E	G	G	-	G	G	E
KOMATSU KPO 10 Powertrain TO 10	HH	-	E	E	G	-	G	G	E
KUNLUN LHM 46	HM	HLP	E	G	G	G	E	G	G
LIEBHERR Hyd Basic 68	HM	HLPD	E	G	G	-	-	-	-
LIEBHERR Hydraulic HVI	HV	HVLDP	E	G	G	-	-	G	-
LIEBHERR Hydraulic Plus	HEPR	HVLDP	G	G	C	G	-	-	-
LIEBHERR Hydraulic Plus Arctic	HEPR	HVLDP	E	E	G	-	-	-	-
LUKOIL Geyser ST	HM	-	E	G	G	G	E	G	G
LUKOIL Geyser ZF	HM	HLP	G	G	G	G	E	G	G
MACDERMID Oceanic BTC 181	HS	-	E	G	G	G	-	G	G
MLC MetLube HFR 220	HFDU	-	G	G	G	G	E	C	-
MICRO QUIMICA Microcorte 530	HFB	-	C	X	C	-	X	C	-

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
MILLERS Millmax 22	HM	-	E	G	G	G	G	G	-
MILLERS Millfood 32	HS	-	G	G	G	-	E	G	E
MOBIL Aero HF 46 (MIL 5606H)	HH	HL	E	G	G	-	C	G	-
MOBIL DTE 10 Excel 46	HV	HVLP	G	E	G	G	C	G	-
MOBIL DTE 10 Excel 68	HV	HVLP	G	G	C	G	C	-	-
MOBIL DTE 13	HV	HVLP	E	G	G	-	E	G	-
MOBIL DTE 24	HV	HVLP	G	G	G	-	E	G	-
MOBIL DTE 25	HV	HVLP	E	G	G	-	E	G	E
MOBIL DTE 26	HV	HVLP	G	G	G	-	E	C	E
MOBIL DTE EXCEL 46	HM	HLP	E	E	G	G	E	G	G
MOBIL DTE EXCEL 68	HM	HLP	G	-	-	-	E	-	-
MOBIL DTE FM 32	HM	-	E	G	G	-	G	G	-
MOBIL EAL 224 H	HETG	-	G	G	E	G	X	E	G
MOBIL Hydrofluid HFDU	HFDU	-	E	E	E	E	G	E	E
MOBIL SHC 524	HM	-	E	G	C	G	E	-	-
MORRIS Triad 32	HM	-	-	G	G	G	G	-	-
MOTOREX Alpine Corex Polar S370	HV	HVLP	G	G	C	G	-	G	-
MOTOREX Corex HW	HV	HVLP	E	G	G	E	E	E	G
MOTUL Shock oil VI 400	HEES	-	G	C	G	-	X	G	-
NALCO Varidos FSK 40%	HFB	-	E	G	E	E	C	E	-
NESTE BIO Hydraulik LONGLIFE 46	HEES	-	G	C	G	-	C	G	-
NESTE BIO Hydraulik SE 46	HEES	-	G	C	G	G	C	G	-
NESTE Hydraulik 32 SUPER	HV	HVLP	E	G	G	G	E	-	-
NESTE Hydraulik 46 SUPER	HV	HVLP	E	G	G	G	E	-	-
NESTE Hydraulik 68 Super	HV	HVLP	G	E	G	G	E	G	E

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
NEW PROCESS AG NP Hyd oil PC HV1 46	HV	HVLP	-	C	C	G	G	-	-
NOALOIL Idro 32	HV	HLP	E	G	G	-	E	G	G
NYCO Hydraulic Oil FH 3 (MIL H 46170 C-1)	HH	HL	E	G	G	G	E	G	-
NYCO Hydraulic Oil FH 51 (MIL 5606H)	HH	HL	E	G	G	G	C	G	-
NYCO Hydraulic Oil FH 6 (MIL 6083H)	HH	HL	G	G	E	-	C	E	C
OEST Dopp-Synth 60	HLP	-	G	X	G	G	X	G	-
OEST Dopp-Synth 70	HLP	-	G	X	G	-	X	G	-
OMD 90	HH	HL	G	G	G	-	-	G	G
OMV Biohyd MS 46 (100°C)	HEES	-	G	G	G	G	-	G	G
OMV HLP AL 46	HL	HLP	E	G	C	-	E	C	-
OMV HLP M32	HV	HVLP	G	G	G	E	-	G	-
OMV Hyd HLP M15	HV	HVLP	E	C	G	G	-	G	-
PANOLIN EP Gear Synth 30 VDT	HEES	-	G	X	G	G	X	G	G
PANOLIN GRO Synth 46	HEES	-	G	C	G	G	C	-	E
PANOLIN HLP Synth 15	HEES	-	G	X	X	-	X	G	-
PANOLIN HLP Synth 46	HEES	-	E	C	G	G	X	G	G
PANOLIN HLP Synth E 46	HEES	-	E	C	G	G	X	G	E
PANOLIN HLP Uni 46	HV	HVLP	E	G	G	-	G	G	-
PANOLIN Orcon Hyd 46	HV	HVLP	G	G	C	G	G	G	-
PANOLIN Trafosynth 2	HEES	-	G	X	G	-	X	G	-
PENTOSIN CHF 11 S (Power Steering)	HV	-	E	G	G	G	E	G	-
PETRO CANADA Hydrex AW 46	HM	HLP	E	G	C	G	C	C	-
PETRO CANADA Hydrex MV 60	HV	HVLP	E	E	G	G	C	G	-
PETROFER Ultra Safe 620	HFC	-	G	C	E	-	X	E	-
PFINDER Aapresol	HH	-	G	G	G	-	E	G	E

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
Q8 Handel 68	HV	HVLP	G	G	G	-	E	G	E
Q8 Haydn	HM	HLP	E	G	G	G	E	G	-
Q8 Heller 46	HV	HVLP	E	G	G	-	E	G	-
Q8 Hogarth 46	HV	HVLP	G	G	C	G	C	G	-
Q8 Holbein	HEES	-	E	G	G	-	G	G	-
Q8 Hummel 46	HM	HLP	E	E	G	-	G	-	-
QUAKER Greensave N 40	HETG	-	G	G	G	-	C	G	G
QUAKER Quintolubric 888	HFDU	-	G	G	G	G	C	G	-
QUAKER Quintolubric 888-46	HFDU	-	G	C	G	G	C	-	-
QUAKER Quintolubric 888-68	HFDU	-	G	C	G	-	C	-	-
QUAKER Quintolubric N 822-300	HFDU	-	G	C	G	-	-	G	-
QUAKER Quintolubric N852	HFDU	-	G	X	G	G	X	E	-
RAUTIO ERGO MIX	HH	-	E	G	G	-	E	-	-
REPSOL Telex 32	HM	HLP	G	E	G	E	G	G	G
ROLOIL Estin S46	HFDU	-	G	C	G	G	X	G	-
SAFETY KLEEN Performance PLUS AW 32	HM	-	G	G	C	G	G	-	-
SHAEFFER 112 HTC	HM	HLP	G	G	G	-	E	-	-
SHAEFFER 112 NZ HTC 32	HM	HLPD	G	G	C	G	G	C	-
SHAEFFER 254 SUPREME ISO 32 TH 220	HM	HLP	G	C	C	G	G	C	-
SHAEFFER 275 S Dilox Supreme MEHF HYD	HV	HLPD	G	E	G	E	E	C	-
SHELL Aeroshell Fluid 41 (MIL 5606H)	HH	HL	E	G	G	-	C	G	-
SHELL Aeroshell Fluid 602 (MIL-PRF 87252C)	HEPR	-	E	E	G	-	E	G	G
SHELL Astron HL 46	HH	-	E	E	G	G	G	-	-
SHELL Donax TA (Torque conv. Allison C-3)	HM	-	-	-	G	G	G	-	-
SHELL Hydraulic oil PW 46	HV	HVLP	E	G	G	E	G	G	G

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
SHELL Irus Fluid DU-NA 46	HFDU	-	E	E	E	-	G	G	-
SHELL Irus Fluid DU-NA 68	HFDU	-	E	E	E	-	G	G	-
SHELL Morlina 220	HL	HLP	G	G	G	G	E	C	G
SHELL Morlina S2 BL10	HL	HLP	G	C	G	G	X	G	G
SHELL Morlina S2 BL5	HL	HLP	C	X	G	C	X	G	G
SHELL Naturelle HF-E15	HEES	-	E	C	G	-	X	G	G
SHELL Naturelle HF-E46	HEES	-	E	C	G	-	X	E	G
SHELL Targon AL plus	HH	-	E	C	E	-	C	G	-
SHELL Tellus Arctic 32	HH	HL	G	G	G	G	G	G	E
SHELL Tellus S1 M 46 (ex Tellus H 46)	HM	-	G	G	G	G	-	-	-
SHELL Tellus S2 M 100 (ex Tellus 100)	HM	-	E	G	G	G	G	G	G
SHELL Tellus S2 M 46 (ex Tellus 46)	HM	HLP	E	G	G	G	E	G	E
SHELL Tellus S2 M 68 (ex Tellus 68)	HM	HLP	E	G	G	G	E	G	-
SHELL Tellus S2 MA 46	HM	HVLP	E	G	G	E	G	G	-
SHELL Tellus S2 V 32 (ex Tellus T 32)	HV	HVLP	E	G	G	E	E	G	G
SHELL Tellus S2 V 46 (ex Tellus T 46)	HV	HVLP	E	G	G	E	E	G	G
SHELL Tellus S2 V 68 (ex Tellus T 68)	HV	HVLP	E	G	G	-	E	G	-
SHELL Tellus S3 V 32 (ex Tellus STX)	HV	HVLP	E	G	C	G	E	G	G
SHELL Tellus S3 V 46 (ex Tellus STX)	HV	HVLP	E	G	C	G	E	G	G
SHELL Tellus S46	HM	HLP	E	G	G	-	E	G	E
SHELL Tellus S4ME 46 (ex Tellus EE 46)	HM	HLP	E	C	-	-	-	-	-
SHELL Tellus TX 68	HV	-	G	C	G	E	G	G	-
SHENYANG TeLi Aeronautic Hydraulic Oil 10#	HV	-	G	-	G	G	C	-	-
SINOPEC L HM 32	HM	HLP	E	-	G	-	G	-	-
SMALLMAN Crownpress 46	HH	-	G	G	G	-	E	G	E

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
SOLUTIA Skydroll 500	HFDR	-	X	X	X	-	X	X	X
STATOIL Hydraway Extreme 46	HM	HLP	E	G	G	E	E	-	-
STATOIL Hydraway HVXA 15	HV	HVLP	G	-	G	G	-	G	-
STATOIL Hydrocor CC44	HFC	-	E	G	E	-	C	G	-
STUART Isocore E 68 Plus	HPG	-	E	G	G	G	C	E	-
SUNOCO Sunvis 746	HM	HLP	E	G	G	G	E	C	G
SUNOCO Sunvis 846	HV	HVLP	E	G	G	G	G	G	G
SUNOCO Sunvis 846 WR	HV	HLP	E	G	G	G	G	G	G
TAMOIL Green Hydro Safety 46	HETG	-	E	E	G	-	-	E	G
TEBOIL Hydraulic arctic	HH	-	G	G	E	G	G	E	E
TEBOIL Eco 46	HEES	-	E	E	G	G	C	G	G
TERRESOLVE Greenscare 46	HETG	-	G	G	G	G	G	G	-
TEXACO Biostar Hydraulic 32	HETG	-	E	C	E	G	C	E	-
TEXACO Hydra 46	HEES	-	E	C	G	-	C	G	G
TEXACO Rando HD 46	HM	HLP	E	G	C	-	G	C	G
TEXACO Rando HD LVZ 46	HV	HVLP	G	G	C	G	G	C	-
TEXACO Rando HD VZ 46	HV	HVLP	G	G	G	G	C	G	G
TEXACO Rando HD VZ 68	HV	HVLP	G	G	G	C	G	G	-
TEXACO Rando HD Z 46	HV	HVLP	E	G	G	G	G	G	-
TEXACO Synstar HT 68	HFDU	-	G	G	E	-	C	E	G
TOTAL Azolla HZS 46	HM	HLP	E	G	G	-	E	-	-
TOTAL Azolla ZS 46	HM	HLP	E	G	G	-	E	G	G
TOTAL Biohydran SE 46	HEES	-	G	C	G	-	X	E	G
TOTAL Equivis ZS 46	HV	HVLP	G	G	G	-	-	C	-
TOTAL Hydransafe HFDU 46	HFDU	-	E	-	G	-	-	-	-

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

HYDRAULIC FLUID	Type		Wire Spiral	Wire Braid				Textile Braid	TPE Textile Braid
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRITEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
TOTAL LHM (Brake fluid)	HS	-	G	X	C	G	X	G	-
UKABIOL HY 46 HTG	HETG	-	G	G	E	-	G	E	G
UNIL Hydro S46	HM	HLP	G	G	G	-	E	C	G
UNIL Opal HV 46	HV	HVLP	G	G	G	G	E	-	-
UNIL Opal HVB 46	HV	HLPD	G	G	G	-	E	-	-
UNIL Opal PO 6	HV	HVLP	E	G	G	G	G	G	G
UNIL Unihyd ISO WG 46	HV	HLPD	E	G	G	G	E	G	G
VALVOLINE Ultramax HVLP 68	HV	HVLP	G	E	G	G	E	-	-
VICKERS Ecosure HSE 68	HEES	-	G	C	G	G	X	C	-
WISURA WM 3021 2,8% in H2O	HFA	-	E	E	E	-	X	E	E
WURTH Triathlon HLP 46	HM	HLP	E	G	C	G	-	-	-
YORK 777	HEES	-	G	C	G	-	X	G	E
ZELLER+GMELIN Divinol HE 46	HEES	-	E	C	G	E	-	G	-

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

PART 2: HYDROKINETIC APPLICATIONS AND LUBRICANT OILS COMPATIBILITY CHART

(AUTOMATIC TRANSMISSION AND VARIOUS LUBRICATION SYSTEMS)

AUTOMATIC TRANSMISSION FLUID (ATF)	TYPE		WIRE SPIRAL DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	WIRE BRAID				TEXTILE BRAID ASTRO SPIRTEX/K MULTITEX PUSH FIT	TPE TEXTILE BRAID HYDROPLAST HYDROTWIN
	ISO 6743-4	DIN 51524		ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR		

AGIP ATF 2D Gear (ATF Dexron II, Mercon II spec)	HA	-	G	G	C	-	G	C	E
AVIA Fluid ATF 86	HA	-	G	G	C	G	E	G	G
BP Autran MBX (ATF Dexron IID) - 100°C	HA	-	E	G	G	G	E	G	-
CASTROL Transynd RD (ATF Allison C4)	HA	-	G	G	C	-	E	-	E
CHEVRON Drivetrain HD (ATF Caterpillar TO4)	HA	-	G	G	C	G	G	C	-
MAG 1 Fully synthetic ATF (ATF Mercon V, Dexron III)	HA	-	-	G	C	-	G	-	-
MILLERS Millermatic ATF UN (ATF Dexron II)	HA	-	-	C	C	-	G	-	-
MOBIL ATF 320	HA	-	G	G	C	G	E	C	G
SHELL ATF III D (ATF Dexron III)	HA	-	G	C	C	G	E	-	-
SHELL Donax ATF III (ATF Dexron III)	HA	-	G	G	C	-	E	G	-
SHELL Donax TX (ATF Dexron III)	HA	-	G	C	C	-	G	-	-
SHELL Spirax S6ATF ZM	HA	-	C	G	X	-	C	-	-
TAMOIL ATF II D (ATF Dexron IID) - 100°C	HA	-	G	G	G	-	E	-	-
TOTAL Fluid NA H3	HA	-	G	G	C	G	E	-	-

GEAR (MECHANICAL TRANSMISSION) FLUID	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
--------------------------------------	------------	-----------	---	-------------------------	---	--------------	---------	---	-------------------------

EXXON MOBIL 424 (gear oil)	C	-	G	G	G	-	G	-	-
FUCHS Planto Hytrac (UTTO gear oil)	C	-	G	C	G	-	C	G	-
LIEBHERR Gear Basic 90 LS (Gearbox oil)	C	-	G	G	G	-	-	G	-

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

GEAR (MECHANICAL TRANSMISSION) FLUID	TYPE		WIRE SPIRAL	WIRE BRAID				TEXTILE BRAID	TPE TEXTILE BRAID
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN

MOBIL SHC PM 320 (Gear oil)	C	-	G	G	C	-	E	-	-
PENZOIL Long Life Gearplus 75w 90	C	-	E	G	G	E	G	G	-
SHELL Donax TD (UTTO gear OIL)	C	-	E	G	G	-	E	-	-
SHELL Omala 320 (Gear oil)	C	-	G	G	C	-	C	G	G
SHELL Omala HD 150 (Gear oil)	C	-	G	G	C	-	C	G	G
SHELL Spirax ASX (Gear oil SAE 80W140)	C	-	G	C	C	-	C	G	-
SHELL Tegula V32 (Gear oil)	C	-	E	G	G	-	E	G	E
TEXACO Textran TDH Premium (UTTO Gear oil)	C	-	E	G	G	G	E	G	-
VALTRA Transmission oil XT 60 (Gearbox)	C	-	G	G	C	-	E	C	-

COMPRESSOR OILS	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
-----------------	------------	-----------	---	-------------------------	---	--------------	---------	--	-------------------------

ANDEROL 497 (Di-ester based compressor oil)	D	-	G	C	G	-	C	G	-
ATLAS COPCO Paroil S BULK (ester based compr. oil)	D	-	G	G	C	-	C	C	-
ATLAS COPCO Roto Foodgrade fluid (Synt blend compr. Oil)	D	-	-	-	-	-	G	-	-
ATLAS COPCO Roto H (mineral based Compressor oil)	D	-	G	G	C	-	G	G	E
ATLAS COPCO Roto Inject Fluid Plus (mineral based compr. Oil)	D	-	G	G	C	-	G	G	E
ATLAS COPCO Roto Inject Fluid (mineral based compr. Oil)	D	-	E	G	G	-	G	G	E
ATLAS COPCO Roto Xtend Duty (PAO compr. Oil)	D	-	-	-	-	-	G	-	-
ATLAS COPCO Roto Z	D	-	-	-	-	-	G	-	-
CASTROL Icematic SW 100 (POE based compressor oil)	D	-	G	G	G	-	-	G	E
CHEVRON Machine oil ISO 32 (Compressor oil)	D	-	G	G	G	-	G	G	G
FUCHS Dea Triton SE 55 (POE based)	D	-	G	G	G	G	-	G	E

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

COMPRESSOR OILS	TYPE		WIRE SPIRAL	WIRE BRAID				TEXTILE BRAID	TPE TEXTILE BRAID
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN

INGERSOLL RAND SSR Ultra plus coolant (POE based compr. oil)	D	-	G	G	G	-	E	G	G
KLUBER Summit Hysyn FG 46 (Synt hydrocarbon comp. Oil)	D	-	G	G	C	G	G	C	-
LUBRIZOL Emkarate RL 100S	D	-	G	G	-	-	-	C	G
MOBIL Arctic EAL 22 (POE based A/C comp. Oil)	D	-	E	E	G	-	G	G	G
MOBIL Glycol 30 (PAG based comp.oil)	D	-	E	E	E	E	E	E	G
MOBIL Rarus SHC 1026 (Compressor oil)	D	-	E	G	G	-	E	G	-
PAG SP 10 (compressor oil)	D	-	G	G	G	-	-	C	E
SHELL Corena D (compressor oil)	D	-	G	G	C	-	E	C	G
SULLAIR AWF	D	-	-	-	-	-	G	-	-
TOTAL Dacnis SH 46 (PAO based comp. Oil)	D	-	-	G	G	G	E	G	-
TOTAL Dacnis VS 46 (mineral based comp. Oil)	D	-	G	G	G	G	E	C	-
VALVOLINE Valcomp Synth 68 Comp. Oil	D	-	-	-	-	-	G	-	-

ENGINE OILS	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
-------------	------------	-----------	---	-------------------------	---	--------------	---------	--	-------------------------

AGIP SINT 2000 (engine oil 10W40)	E	-	G	G	G	-	G	E	G
AGIP Tec sint SL5W40 (engine oil 5W40)	E	-	E	G	C	-	G	-	-
BP Vanellus C 5 (engine oil 15W40)	E	-	E	G	G	G	G	-	-
CHEVRON Delo 400LE (Engine oil 15W40)	E	-	G	G	C	G	G	G	-
CHEVRON RPM 30 (Engine oil)	E	-	G	G	G	G	E	G	-
FUCHS Plantohydramot SL 5W40 (STOU engine oil)	E	-	G	G	C	G	G	G	-
FUCHS Titan GTI Pro C 2 (Engine oil 5W30)	E	-	G	G	G	-	C	G	-
IGOL Marine 15W-40 (engine oil)	E	-	G	G	G	-	-	-	-

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

TURBINE OILS	TYPE		WIRE SPIRAL	WIRE BRAID				TEXTILE BRAID	TPE TEXTILE BRAID
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN

JCB Engine oil EP (Engine oil 15W40)	E	-	E	G	G	-	G	G	G
MOBIL Delvac 1310 (engine oil 10W20)	E	-	E	G	G	-	G	E	G
Q8 T720 (engine oil 15w40)	E	-	E	G	G	-	E	G	-
SHELL Helix Ultra (Engine oil 5W40)	E	-	G	G	G	-	E	G	-
SHELL Rimula R3 (Engine oil 10W)	E	-	E	G	G	-	E	G	E
SHELL Rimula X30 (Engine oil 10W)	E	-	E	G	G	G	E	G	E
SHELL Rotella TMG (Engine oil 15W40)	E	-	G	G	G	G	E	G	-
SHELL V oil 1404	E	-	G	G	G	-	G	G	G
MOBIL Jet oil II	T	-	E	C	G	E	C	E	-
NYCO Turbonicoil TN 13 B	T	-	G	X	X	G	X	E	-

HEAT TRANSFER FLUIDS	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
----------------------	------------	-----------	---	-------------------------	---	--------------	---------	--	-------------------------

CHEVRON Havoline XLC (Fluid cooler)	Q	-	E	G	G	-	X	G	-
MOBIL Therm 605	Q	-	G	G	G	-	E	G	-
NESTE Fluid cooler BIO	Q	-	E	G	G	G	-	G	-
NESTE Super fluid cooler XLC	Q	-	E	G	G	-	-	G	-
PETROCANADA Calflo (Heat transfer fluid)	Q	-	G	G	G	E	G	G	-
PETRONAS Paraflo HT (OAT) at 100°C	Q	-	E	G	G	-	X	G	-
Water Glycol emulsion (50%) at 100°C	Q	-	E	G	G	-	X	G	E

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

METAL WORKING FLUIDS	TYPE		WIRE SPIRAL	WIRE BRAID				TEXTILE BRAID	TPE TEXTILE BRAID
	ISO 6743-4	DIN 51524	DIAMONDSPIR SHIELDMASTER ROCKMASTER GOLDENISO/XF FORESTMASTER	ETERNITY/2 NOZONE 2K	TRACTOR SHIELDMASTER ROCKMASTER HARVESTER/17 GOLDENISO LYTEFLEX COVER	GOLDENISO/LL	EQUATOR	ASTRO SPIRTEX/K MULTITEX PUSH FIT	HYDROPLAST HYDROTWIN
BUDEMEIM Phosphatherm 948	M	-	E	E	E	-	X	E	-

WARNING: Compatibility of hose and fittings with conveyed fluid is an essential factor in avoiding chemical reactions that may result in release of fluids or failure of the hose or connection. This chemical compatibility guide must not be used in conjunction with any other compatibility guides from previous or future catalogue editions, bulletins or publications. Incorrect use of these charts could result in death, personal injury or property damage.

FLUID COMPATIBILITY CHART

PART 3: BEHAVIOUR TO CHEMICALS FOR NON-HYDRAULIC APPLICATIONS (GUIDELINES FROM LITERATURE)

APPENDICES
A 4-23

FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Acetaldeide	X	C	X	C	G
Acetic Acid, 10%	X	C	G	G	G
Acetic Acid glacial	X	X	C	G	C
Acetone	C	C	X	G	G
Air (60°C)	G	G	E	E	E
Air (100°C)	C	G	E	E	G
Air (150°C)	X	X	G	G	X
Ammonia, gaseous	C	G	-	-	X
Ammonia, liquid cold	E	E	G	-	X
Ammonia, liquid 70°C	X	C	C	-	X
Ammonium Hydroxide, 10%	G	G	E	E	-
Ammonium Hydroxide, conc	C	C	C	C	-
Ammonium nitrate (aqueous solutions)	G	G	G	G	G
Ammonium phosphate, mon-di-tri basic (aq. Sol)	E	E	E	E	C
Ammonium sulphate (aqueous solution)	E	E	E	E	C
Aniline	X	C	X	X	X
Aqua regia	C	C	X	C	-
ASTM oil n°1, 100°C	E	E	G	G	E
ASTM oil n°2, 100°C	E	G	C	C	E
ASTM oil n°3, 100°C	E	C	C	C	E
Benzene	X	X	X	C	C
Boric acid 10% 100°C	G	G	G	X	G
Brake fluid (SAE J 1703d)	X	-	X	G	-
Brine	E	C	C	G	G
Butanol	E	G	G	G	E

WARNING: No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed. The possible good rating and on field performance of the hose with a chemical mentioned in the list, does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals. No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed.

FLUID COMPATIBILITY CHART

FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Calcium bicarbonate	E	E	E	E	-
Calcium hydroxide (Aqueous suspensions)	E	E	G	G	-
Carbonic anhydride	G	E	G	G	E
Chlorine	X	X	X	X	X
Chloroform	C	C	X	X	X
Citric Acid, 33%	G	G	G	-	E
Crude oil	E	X	X	X	G
Detergent water solution	G	G	C	G	G
Dibenzyl ether	X	X	X	X	-
Diethyl phtalate (DEPH)	C	X	X	X	E
Epichlorhydrine	X	X	C	X	X
Ethyl acetate	C	X	C	C	G
Ethyl alcohol	E	E	E	E	E
Ethyl ether	G	C	-	-	-
Ethylene	E	G	-	-	G
Ethylene glycole	E	E	G	G	E
Ethylene glycole (100°C)	E	G	G	G	G
Formaldehyde	C	G	C	G	G
Formic acid 23°C (saturated solution)	G	G	G	X	G
Formic acid 75°C (saturated solution)	C	G	C	X	C
Glycerine	E	E	E	E	E
Heptane	G	C	X	C	E
Hydraulic oils (see detailed table)	*	*	*	*	*
Hydrochloric acid, 10%	G	G	G	X	G
Hydrochloric acid, 37%	C	C	C	X	X
Hydrochloric acid, 37% 70°C	X	X	X	X	X
Hydrocyanic acid 20%	C	C	-	-	-
Hydrogen sulphide	C	G	C	X	E

WARNING: No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed. The possible good rating and on field performance of the hose with a chemical mentioned in the list, does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals. No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed.

FLUID COMPATIBILITY CHART

FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Isobutyl alcohol	G	G	G	G	E
Isopropyl alcohol	G	E	E	E	E
Iso-octane	G	C	X	C	E
Kerosene (aromatics 40%max, 70°C)	G	C	X	C	-
Lead free petrol	G	C	X	C	E
Magnesium hydroxide (aqueous solutions)	G	E	E	E	-
Mercury	E	E	E	E	E
Methanol	G	E	E	E	G
Methyl methacrylate	X	X	X	X	-
Methylethylketone (MEK)	X	C	X	C	E
Nitric acid, concentrated 65%	X	X	X	X	X
Nitric acid, diluted 10% 50°C	C	X	X	C	X
Nitric acid fuming	X	X	X	X	X
Nitrogen	E	E	E	E	E
Oleic acid	G	C	C	C	E
Oleum	X	X	X	X	X
Oxalic acid 25% 80°C	G	E	G	X	-
Oxygen (80°C)	C	G	C	G	E
Paraffin	E	E	C	E	E
Pentane	G	C	X	C	E
Petrol	E	C	X	C	E
Petroleum, 70°C	E	G	X	C	E
Phenol	X	X	X	X	C
Phosphoric acid 20%	G	E	E	X	-
Phosphoric acid 60% 50°C	C	G	C	X	-
Phosphoric acid 85%	C	G	C	X	-
Phosphorous tri-chloride	X	X	X	X	-
Picric acid 10% 100°C	C	C	G	G	-

WARNING: No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed. The possible good rating and on field performance of the hose with a chemical mentioned in the list, does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals. No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed.

FLUID COMPATIBILITY CHART

FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Potassium chloride (aqueous solution)	E	E	E	E	-
Potassium hydroxide 70°C (medium high conc.)	G	G	-	-	E
Potassium sulphate (aqueous solution)	E	E	E	E	-
Sea water	E	G	C	G	E
Soaps	E	G	G	G	E
Soda caustic	C	G	G	C	G
Sodium bicarbonate	E	E	E	E	G
Sodium chloride (aqueous solution)	E	E	G	G	E
Sodium hydroxide	C	G	G	C	E
Sodium hydroxide 70°C (medium high conc.)	C	G	G	C	F
Sodium hypochlorite (aqueous solutions)	C	G	C	X	E
Sodium silicate (aqueous solutions)	E	E	E	E	-
Sodium sulphate (aqueous solution)	E	E	E	E	-
Sodium sulphide	E	E	E	E	-
Stearic acid	E	E	C	E	E
Sulphur	X	X	G	G	-
Sulphur dioxide	X	X	X	X	-
Sulphuric acid (hot concentrated 96°C)	X	X	X	X	X
Sulphuric acid (diluted 20%)	X	X	C	C	E
Sulphuric anhydride	X	C	C	C	-
Sulphurous acid	X	X	C	C	X
Tannic acid	G	G	G	X	E
Tannin	E	E	E	E	E
Tartaric acid 20%	E	G	G	X	-
Tetraethyl lead	G	C	X	-	-
Toluene	X	X	X	X	E
Turpentine	G	X	X	X	-
Urea	E	E	G	G	-

WARNING: No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed. The possible good rating and on field performance of the hose with a chemical mentioned in the list, does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals. No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed.

FLUID COMPATIBILITY CHART

FLUID	NITRILE	CHLOROPRENE	CHLOROSULPHONATED POLYETHYLENE	CHLORINATED POLYETHYLENE	POLYESTER
Vinyl acetate	C	C	C	G	-
Vinyl chloride	X	X	X	X	-
Water	E	G	X	G	E
Xylene	C	X	X	X	G
Zinc chloride (aqueous solutions)	E	E	G	X	E
Zinc sulphate (aqueous solutions)	E	E	G	X	-

WARNING: No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed. The possible good rating and on field performance of the hose with a chemical mentioned in the list, does not mean in any case the release by Manuli Hydraulics of the product for that application or any guarantee. The possible validation for use is under the sole and exclusive responsibility of the end user and no liability whatsoever can be attributed to Manuli Hydraulics in that regard. In fact Manuli Hydraulics hoses are designed for hydraulics use and applications, they are not intended for industrial diversified applications with various chemicals. No tests on finished hose assemblies in combination with the mentioned chemicals has been normally performed.