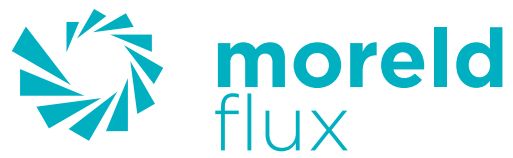




Group 3

Umbilical Hoses

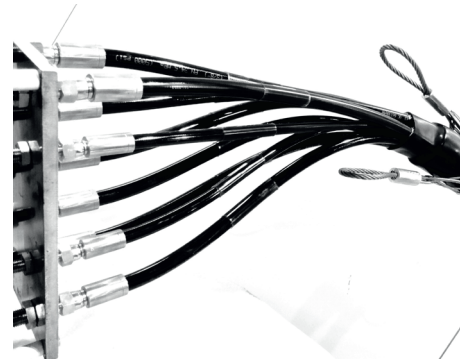


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UMBILICAL HOSES®

Flux established an umbilical production in 2014 to deliver customized design and ensure short lead time. A particular area in which we specialize is the short-length umbilical market. We provide a custom-engineered service encompassing design, engineering, manufacturing, testing and installation together with back-up support and after-sales service that the medium/large manufacturers can not match.

We offer fast track turnaround and delivery of finished product due to our extensive stockholding of specialist hydraulic control line hoses, combined with our in-house capability to manufacture bespoke or specialist end connections in both standard and exotic materials such as Monel, Inconel, 6MO, Super Duplex etc. Flux has close relationships with key suppliers to secure short delivery time and access to a wide range of hoses and fittings. Our Extrusion and Coatings service encompasses the encapsulation of both single hose and hose bundles with a Polymer or Elastomer cover that significantly increases hose service life whilst assuring operational reliability.



A TYPICAL PRODUCTION PROCESS

Bundling	All lines are bundled in the production assembly line.
Extrusion & Braiding	The bundle is typically extruded with a cover of flameretardant polyurethane or other materials specified by our customers. Aramid wire and steel wire for tension relief are available options.
Termination	Upon completion of the extrusion process our certified hose fitters terminate the hoses with the specified connectors / fittings.
Testing & Flushing	All lines undergo a hydrostatic pressure test in accordance to applicable standards and flushing according to customer specification. When requested we invite Third Party to witness the testing.
Tag / Marking	The umbilical will be tagged and marked in accordance with Flux standard procedure. The tags will include customer reference or other requested information. Customer specific marking is possible.
Final Inspection	Final inspection is an important step of our quality process and performed prior packing and shipment sent to our customer.

FLUX'S UMBILICALS COVER A RANGE OF NEEDS AND APPLICATIONS:

- Tension ring umbilicals
- Service loop bundles
- Topside Control Umbilical
- Topside wellhead control
- BOP Control Umbilicals
- Hydraulic Flying Leads
- Deck Jumper for intervention workover control system
- Hydraulic service lines
- Lubrication and grease umbilical
- In field wellhead umbilicals
- Service lines
- Chemical injection lines
- Wireline umbilicals
- Gas umbilicals
- Subsea jumpers



CAPABILITY AND CUSTOMIZED FEATURES

- Produced in-house; from design to delivery
- Design to customer requirements / specification.
- Continuous lengths in excess of 600mtr
- Fully ISO 13628-5 / API 17E compliant thermoplastic hoses
 - Aramid fibre reinforced hoses
 - Steel wire reinforced hoses
- High Collapse Resistance Hose
- Wide range of HP, HT and chemical compatibility
Working pressures in excess of 2000 bar / 29000 PSI
- Choice of wire and synthetic strength members and ropes
- Choice of cover options such as material, sheath colors, print and tagging
- Continuous sheaths of Thermoplastic Polyurethane that provides
 - Excellent wear resistance.
 - Total assembly encapsulation preventing sea water ingress
 - Corrosion elimination
 - Resistance against microbial attack
 - Withstands repeated flexing
 - Flame-proof - halogen free.
 - Conductive or non-conductive cover
- Polyethylene overbraids cover or plastic spiral guards.
- Bend restrictors / stiffeners
- Terminations can be supplied with:
 - JIC, BSP, NPT, and more
 - AISI 316 / 316Ti, Duplex, 6MO, and more
 - armour bodies, pull in heads, hang-off collars, MQC, stab-plates, quick-connects

Documentation package
Our standard documentation package consists of the following documents:

- Hydrostatic Pressure Test Reports
- Flushing Certificate
- Datasheets
- Drawings

Other documents are available on request.

Service and repair of umbilical

- Re-termination of hose fittings
- Testing / Flushing
- Repair of outer sheet
- Re-application Armour Body
- Moulded bend stiffener

Benefits of using Flux

- Short lead times
- Customized design
- Certified hose fitters
- Extensive knowledge and competence within the field of flexible hose solutions
- Wide range of hoses and couplings supplied from world class manufacturers in stock

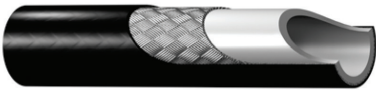


Type 57xHVN Velocity Hose

APPLICATIONS:
High pressure hose for use with oil-based and synthetic hydraulic oils. Especially designed for applications where low volumetric expansion and stable pressure is required.
Max length change is +/- 2% at working pressure.

CONSTRUCTION:
Covering: Black special Polyurethane
Reinforcement: 1 or 2 layers braided synthetic aramid fiber
Internal: Polyamide
TEMPERATURE RANGE: +40°C to +100°C for synthetic and oil-based hydraulic oils, max. 70°C for water or methanol-based fluids

#	Ø			P			R		W		Fitting Series
Part No	mm	inch	dash	mm	bar	psi	bar	psi	mm	kg/m	
573HVN-3	5.1	3/16	-03	9.0	307	3000	1228	15000	50	0.06	-
575HVN-3	5.1	3/16	-03	9.0	345	5000	1380	20000	50	0.06	-



Type 575X Hotline Hoses

APPLICATIONS:
High pressure hose for use with oil-based and synthetic hydraulic oils. Especially designed for applications where low volumetric expansion and stable pressure is required.
Max length change is +/- 2% at working pressure.

CONSTRUCTION:
Covering: Black special Polyurethane, optional second layer
Reinforcement: 1 or 2 layers braided synthetic aramid fiber
Internal: Polyamide
TEMPERATURE RANGE: +40°C to +100°C for synthetic and oil-based hydraulic oils, max. 70°C for water or methanol-based fluids

#	Ø			P			R		W		Max Length (m)
Part No	mm	inch	dash	mm	bar	psi	bar	psi	mm	kg/m	
575X-16	25.9	1	-16	40.2	345	5000	1380	20000	254	0.70	4 267
1-575X-16-xxxx	25.9	1	-16	44.2	345	5000	1380	20000	280	0.99	40267



Type 2390N/2380N Hotline Hoses

APPLICATIONS:
For applications requiring high tensile strength and improved mechanical resistance.
Available with two core tube options.
Low dimensional change under pressure and smooth bore for low pressure drop.

CONSTRUCTION:
Covering: Black Polyurethane
Reinforcement: Steel wire and aramid combination
Internal: Polyamide PA12 or methanol washed PA11
TEMPERATURE RANGE: +40°C to +100°C for oil-based hydraulic oils

#	Ø			P			R		W		Max Length (m)
Part No	mm	inch	dash	mm	bar	psi	bar	psi	mm	kg/m	
2390N-16Vxx	25.2	1	-16	35.0	280	4061	1120	16200	280	1.17	4 267
2380N-16Vxx	25.2	1	-16	37.0	380	5510	1520	22040	290	1.49	4 267

BOP Stack Hoses Type 2390N



APPLICATIONS:

High pressure hydraulic systems for petroleum- and synthetic-based hydraulic oils. Flexible, compact design with a low minimum bend radius which makes them the ideal choice for efficient plumbing of BOP stack hydraulic lines.







Low volumetric expansion, smooth bore for low pressure drop, sea-water resistant polyurethane jacket.

CONSTRUCTION:

Covering: Black Polyurethane
Reinforcement: 2 closed spiral layers and 2 open spiral layers of high strength wire

Internal: Polyamide PA11
Colors: Blue, Green or Yellow

TEMPERATURE RANGE: +40°C to +100°C for oil-based hydraulic oils

#											
Part No	Color	mm	inch	dash	mm	bar	psi	bar	psi	mm	kg/m
2390N-08V12	Blue	12.8	1/2	-08	21.3	415	5000	1660	20000	150	0.54
2390N-08V13	Green	12.8	1/2	-08	21.3	415	5000	1660	20000	150	0.54
2390N-08V16	Yellow	12.8	1/2	-08	21.3	415	5000	1660	20000	150	0.54
2390N-16V12	Blue	25.2	1	-16	35.0	280	4060	1120	16240	280	1.17
2390N-16V16	Yellow	25.2	1	-16	35.0	280	4060	1120	16240	280	1.17
2380N-16V12	Blue	25.2	1	-16	37.0	380	5510	1520	22040	290	1.49
2380N-16V16	Yellow	25.2	1	-16	37.0	380	5510	1520	22040	290	1.49

**Improved Reliability Through Sealing and Port Retention
Combination radial seal and face seal gives Dual Seal Flange
Fittings superior leak-free port connections.**

Parker's Dual Seal Flange Fittings use both a radial seal and face seal to achieve superior leak-free port connections. The primary radial seal reinforces the fitting's pressure capabilities while providing additional system integrity

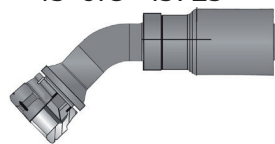
E3 Series fittings are available for 1/4", 1/2" and 1" hose sizes with straight, 45° or 90° benttube configurations.

Fittings E3 Series

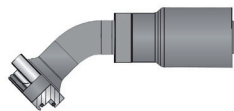


Parker Part Number	Description
19WE3-24-16C	1" Hose -24 Dual Seal 90° Fitting
19ME3-24-16C	1" Hose -24 Dual Seal 45° Fitting
19GE3-24-16C	1" Hose -24 Dual Seal Straight Fitting
19WE3-16-16C	1" Hose -16 Dual Seal 90° Fitting
19ME3-16-16C	1" Hose -16 Dual Seal 45° Fitting
19GE3-16-16C	1" Hose -16 Dual Seal Straight Fitting
19WE3-16-8C	1/2" Hose -16 Dual Seal 90° Fitting
19ME3-16-8C	1/2" Hose -16 Dual Seal 45° Fitting
19GE3-16-8C	1/2" Hose -16 Dual Seal Straight Fitting
19WE3-8-8C	1/2" Hose -8 Dual Seal 90° Fitting
19ME3-8-8C	1/2" Hose -8 Dual Seal 45° Fitting
19GE3-8-8C	1/2" Hose -8 Dual Seal Straight Fitting
139E3-16-16C-411	1" Hose -16 JIC Female 90° Fitting
137E3-16-16C	1" Hose -16 JIC Female 45° Fitting
139E3-8-8C-411	1/2" Hose -8 JIC Female 90° Fitting
137E3-8-8C	1/2" Hose -8 JIC Female 45° Fitting
139E3-4-4C	1/4" Hose -4 JIC Female 90° Fitting
137E3-4-4C	1/4" Hose -4 JIC Female 45° Fitting
139E3-6-4C	1/4" Hose -6 JIC Female 90° Fitting
137E3-6-4C	1/4" Hose -6 JIC Female 45° Fitting
106E3-16-16C	1" Hose -16 JIC Female Swivel Straight Fitting
106E3-8-8C	1/2" Hose -8 JIC Female Swivel Straight Fitting
106E3-6-4C	1/4" Hose -6 JIC Female Swivel Straight Fitting
106E3-4-4C	1/4" Hose -4 JIC Female Swivel Straight Fitting

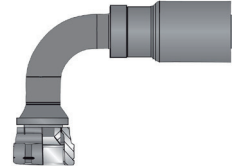
45° JIC - 137E3



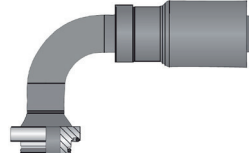
45° Dual Seat - 19ME3



90° JIC - 139E3



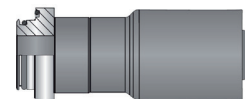
90° Dual Seat - 19WE3



Straight JIC - 106E3



Straight Dual Seat- 19GE3





700 m BOP Control Umbilical with 101 lines delivered to a drilling rig in the UK sector.



40 Topside control umbilicals, 12 ways hydraulic hoses, delivered for the Johan Sverdrup project in 2017.



Umbilical subsea deck jumpers, 140m long with 15 hydraulic lines delivered in summer 2018, to a North sea project.



12 short umbilicals with 6 hydraulic lines installed on Gullfaks Topside Control unit. Planning to replace a total of 170 umbilical on Gullfaks A, B and C.