

# OILFIELD LUBRICATION



**CLARE**  
ADVANCED LUBRICATION



## Regain and Maintain Well Integrity

The integrity of wellhead pressure control valve equipment is a very important aspect of upstream field operations, ensuring the equipment works correctly, at all times.

The selection & application of the correct gate valve lubricant is proven to influence significantly the sustained integrity of gate valves, or regaining integrity when it has been lost.

### A COST EFFECTIVE OPERATION

Select a valve lubricant on its performance criteria and it will deliver operational cost savings through:

- extended preventative maintenance periods
- fewer unplanned maintenance interventions
- reduced NPT
- reduced spend on valve components

### ADVANCED VALVE LUBRICANTS

RS Clare's premium valve lubricants have been comprehensively proven to deliver increased integrity and valve functionality.

- Developed in conjunction with Valve OEMs and international field operators
- Extensive lab R&D and valve testing
- Backed by critical field trials.

Resistant to produced chemicals...

- H<sub>2</sub>S
- CO<sub>2</sub>
- Condensates and other hydrocarbon solvents
- Crude oil
- Natural gas

...our valve lubricants are not dissolved and displaced from the valve cavity. Valve components will not be rendered dry and exposed to wear and damage from increased friction. The cavity will not become devoid of lubricant and will be protected from the ingress and entrapment contaminants such as corrosive fluids or sand.

## Preventative Maintenance

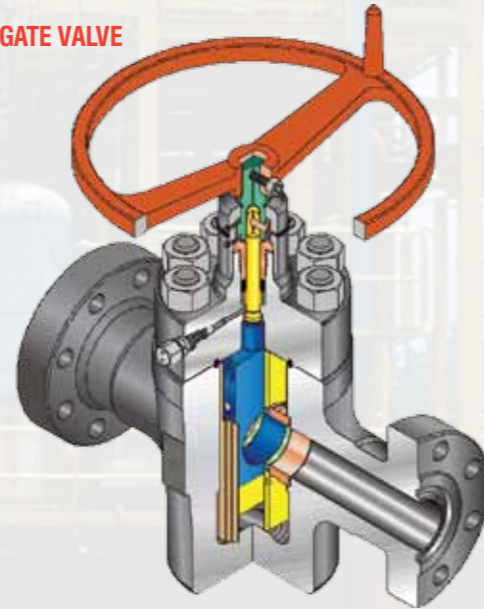
Poor maintenance or using the wrong lubricant can cause severe valve operational problems, including damage to the component sealing surfaces, an increase in the required actuation torque or force, or worst case in seizure of the valve.

Routine valve re-lubrication using a premium Clare valve lubricant is a highly important aspect of preventative maintenance and will ensure optimum valve protection.

### Gate valve lubricant key functions:

- Provide an integral lubricating film between the gate & seat and the threaded stem
- Withstand the high interfacial contact stress between gate & seat surfaces.
- Displace corrosive chemicals and fluids from the valve cavity
- Provide a barrier to prevent further ingress of contaminants

API 6A GATE VALVE



GATE AND SEATS HAVE CRITICAL METAL TO METAL SEALING SURFACES



### Secondary benefits:

- Provide additional corrosion protection to the 'exposed' internal valve components, particularly if the metallurgy is underspecified.
- Restore valve integrity, by providing a sustained leak sealing capability.

## Valve Lubricant 601

- Fully synthetic grease compound
- Delivers both lubrication and sealing
- Specially formulated to provide optimum resistance to aggressive produced fluids and gases and process chemicals
- Field-proven to reduce valve failure in sand service.
- Adhesive texture ensures maximum retention in the valve cavity and minimises the amount of lubricant removed from the cavity during cycling under high differential pressure.
- Extended re-lubrication intervals when compared with many other valve lubricants.
- Field proven as a high performance sealant.
- Inject into valves which require an operational sealant, (e.g. McEvoy gate valve) for long term high pressure sealing properties without hardening.



✓ API 6A OEM APPROVAL

## Corrective Maintenance

Through many field trials, RS Clare's valve lubricants have been proven to seal leaking gate valves, for sustained periods, where other valve lubricants have been unsuccessful. Our leading valve lubricant, 601, is field proven to seal on average 65-75% of leaking valves.

### SEALING LEAKING GATE VALVES

If damage to the sealing surfaces is more severe, a heavy duty sealant is required to plug the leak pathway. For these cases, RS Clare has developed **Valve Sealant 701**.

- Better sealing performance than other products available on the market
- Full resistance to produced fluids and gases
- Good lubricity - the valve will still operate under high DP
- High adhesion - will remain on sealing surfaces & in the valve cavity
- Pump using your current specification grease injection equipment through API 6A grease injection fitting.



DAMAGED GATES



## 601 Cleaner

A non-hazardous, synthetic cleaning fluid, 601 Cleaner, is available to remove hydrocarbon resistant lubricants during valve repair and refurbishment or to flush the valve during in-situ maintenance.

## Valve Sealant 701 - An extensive R&D programme

- Design of a lab "Sealant Test Rig" for evaluation and comparison of different sealing compounds.
  - Evaluates the ability of the sealant to "hold" within the groove cut in the test pieces, under increasing applied pressure.
  - Proved that 701 could reliably seal 1.5mm and 2.0mm scratch sizes to 6,000psi and 1,000psi respectively.
- Full Scale API 6A Valve testing
  - Engineer-cut grooves introduced to valve seats
  - 701 was found to reliably seal a 1.5mm groove to a pressure of 5000 psi, a 2mm groove to 4000psi and a 2.5mm groove to 1500psi.
  - Testing medium was water
- Third party OEM testing with gas as the test medium.



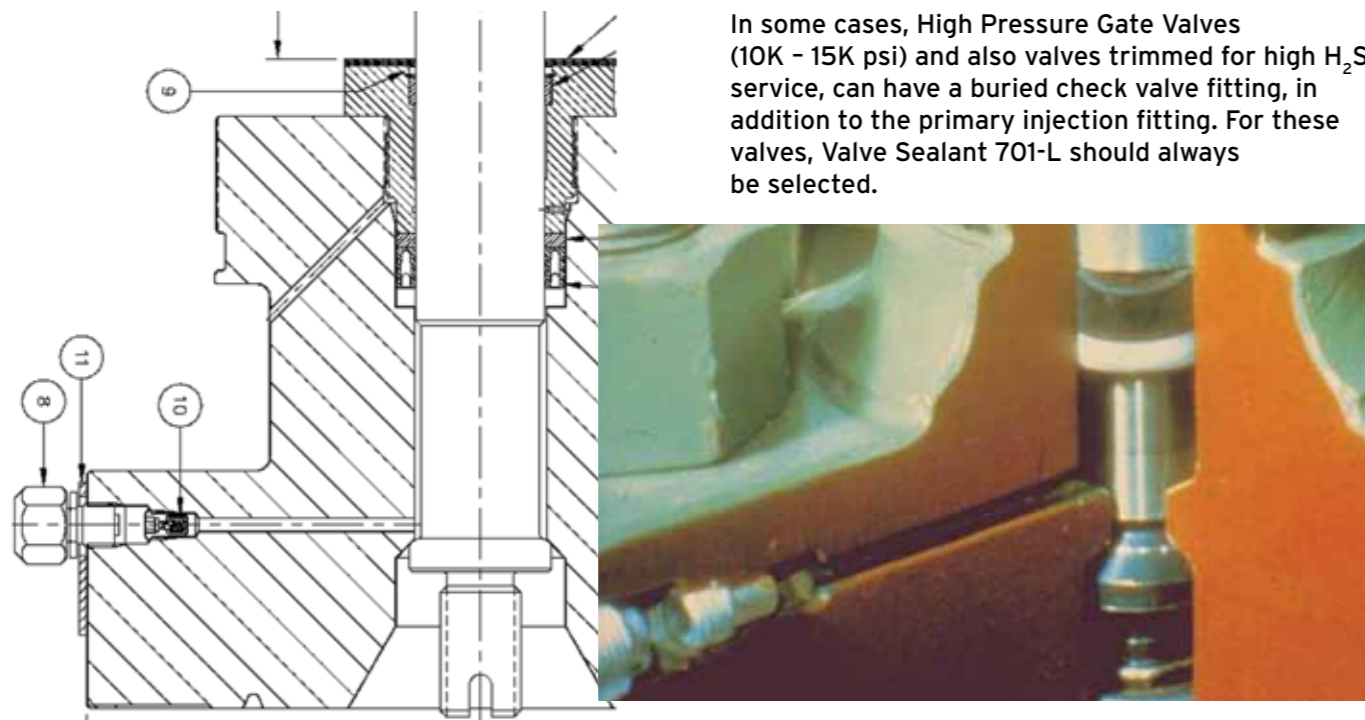
701 is now used extensively by operators and maintenance contractors and is supported by field testimonials from around the globe.



Note the difference in texture between the sealant and the lubricant – but 701 still has enhanced lubricating properties.



In some cases, High Pressure Gate Valves (10K - 15K psi) and also valves trimmed for high H<sub>2</sub>S service, can have a buried check valve fitting, in addition to the primary injection fitting. For these valves, Valve Sealant 701-L should always be selected.



## Hydrocarbon Resistance

A fundamental requirement of the valve lubricant is resistance to liquid & gas phase hydrocarbons.

Valve Lubricant 601 (left) is tested against a standard valve lubricant (right).

A sample of each lubricant is applied to a metal plate, and then placed within a container of hydrocarbon fluid.



The fluid breaks down the GP valve lubricant very quickly. In the valve, the grease would be washed out of the cavity when cycled just a few times. Valve Lubricant 601 is unaffected by the hydrocarbon fluid, regardless of exposure time, thus providing long term cavity retention.

## Lower ambient temperature environments?

Our premium lubricants and sealants are also available in **Winter** and **Arctic** grades.



**VALVE LUBRICANT PRODUCT RANGE**

Product	Application	Operational Temperature Range	Pumpable Temperature Range	Approx. NLGI Grade	Density g/cm <sub>3</sub>	4 Ball EP Test IP239	Service											
							Standard Crude Oil	Natural Gas	Sand Ingress	H <sub>2</sub> S - Sour Crude & Gas	High CO <sub>2</sub>	Gas Well Condensate	Diesel Completion Fluid	Frac Acid (Upto 20% conc. HCl)	60 % Methanol	40% Water	100% Methanol	
Valve Lubricant 601	Gate & Plug Valve	-20°F to 350°F	> 30°F	2	1.39	>620 kg	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X
Valve Lubricant 601 WG	Gate & Plug Valve	-40°F to 300°F	> -10°F	1	1.37	>620 kg	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X
Valve Lubricant 601 WGx	Gate & Plug Valve	-50°F to 300°F	> -25°F	1	1.35	>450 kg	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X
Valve Lubricant 601 AG	Gate & Plug Valve	-60°F to 250°F	> -40°F	1	1.35	>450 kg	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X
Valve Lubricant 501	Gate Valve	-75°F to 250°F	> -50°F	2	1.35	>620 kg	✓	✓	✓	X	✓	X	✓	✓	✓	✓	✓	X
601 Fluid	Ball Valve	-20°F to 350°F	> -20°F	-	1.18	>620 kg	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X

**VALVE SEALANT PRODUCT RANGE**

	Operational Temperature Range	Pumpable Temperature Range	Approx. NLGI Grade	Density g/cm <sub>3</sub>	4 Ball EP Test IP239	Safe to use with Secondary 'Buried' Check Valve Fitting
Valve Sealant 701	0°F to 350°F	>50°F	No.2	1.39	Weld Load > 620kg	NO*
Valve Sealant 701-L	0°F to 350°F	>50°F	No.2	1.39	Weld Load > 620kg	YES
Valve Sealant 701 WG	-40°F - 300°F	>0°F	No.2	1.32	Weld Load > 620kg	NO*
Valve Sealant 701-L WG	-40°F - 300°F	>0°F	No.2	1.32	Weld Load > 620kg	YES

\*Prior to injecting 701/701 WG, the Operator should identify the exact make, model and pressure rating of the gate valve, and confirm the arrangement of the sealant injection fitting(s) in the valve's bonnet

**PLUG VALVE LUBRICATION**

Standardise on one lubricant on all wellhead and downstream flow control equipment.

Plug valves are used as compact shut-off valves in a wide range of production and process flow equipment. Such valves are designed to operate with a lubricant/sealant.

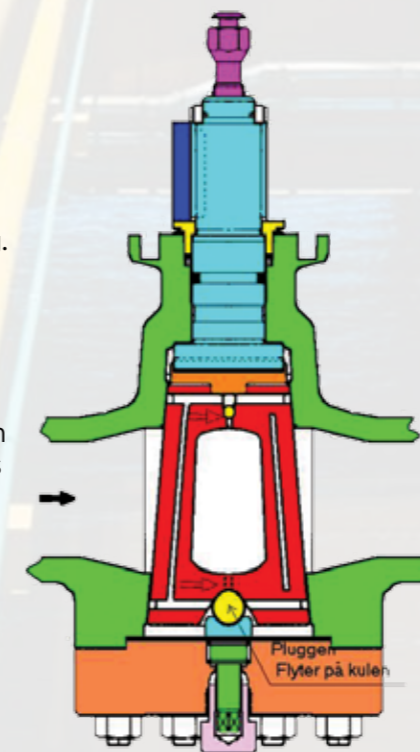


When the lubricant is applied to the valve, it is distributed between the sealing faces of the valve body and plug. The lubricant provides:

- an integral sealing and corrosion preventative film
- a smooth, controlled actuation over extended maintenance periods.

Valve Lubricant 601 has been field proven to remain cohesive within the plug valve whilst providing the necessary sealing.

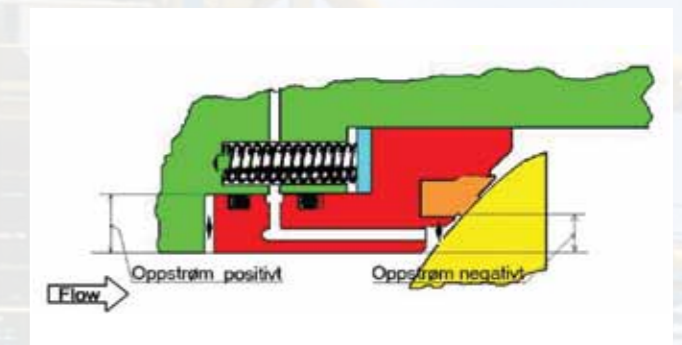
Other inferior sealants may harden, resulting in leakage and exceptionally high actuation torques damaging the valve stem.



**BALL VALVE LUBRICATION**

The lubrication of a ball valve requires a different practice to the lubrication of either a gate valve or plug valve.

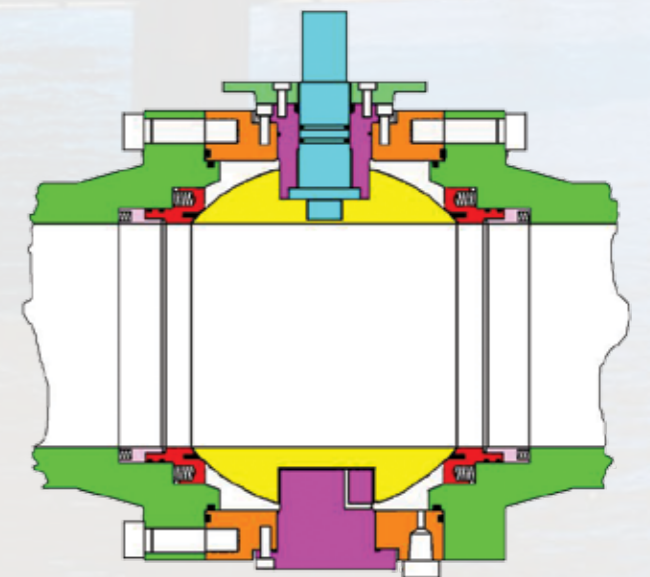
Field experience has shown that greases and sealants may cause severe problems with the seat and seal arrangement if used regularly during preventative maintenance. If a non-leaking ball valve is lubricated with an adhesive grease/sealant, the floating, spring loaded seats can become stuck within their seat pockets. When the ball floats due to a pressure differential across the valve, the seals cannot track the ball and leakage can occur.



**601 Fluid** is a viscous, synthetic ball valve lubricant

- Offers the same enhanced resistance to hydrocarbon fluids and gases as 601
- Inject routinely to flush and lubricate ball valves.
- Will not dry out or form a gum, when used within its application temperature range
- Will not disrupt the operation of the seat and seal arrangement.

Use Valve Lubricant 601 for leaking ball valves - it acts as a high pressure sealing compound without hardening within the seal arrangement.



## Standardise on one gate valve lubricant

RS Clare premium valve lubricants are used to lubricate gate valves installed in a large range of oilfield pressure control equipment for:

- Production
- Drilling
- Well Testing
- Well Intervention & Workover
- Subsea

This unique 'wide application' capability allows field operators to standardise on one gate valve lubricant whilst ensuring maximum operational protection.



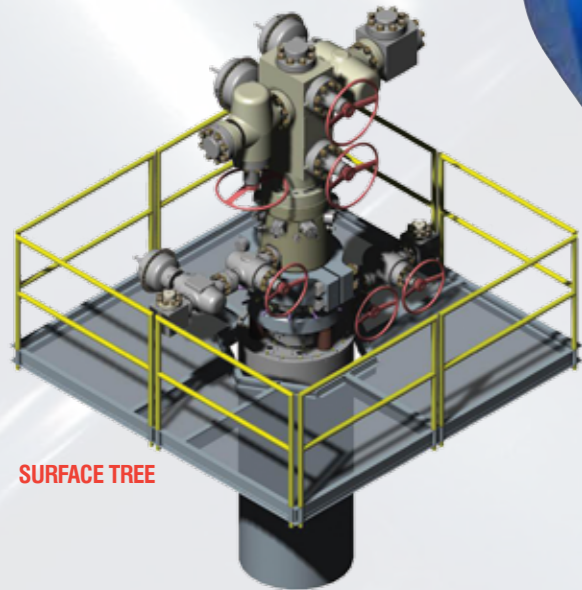
FLOW MANIFOLD



SEPARATOR – GATE AND PLUG VALVES



SAND FILTER – GATE AND PLUG VALVES



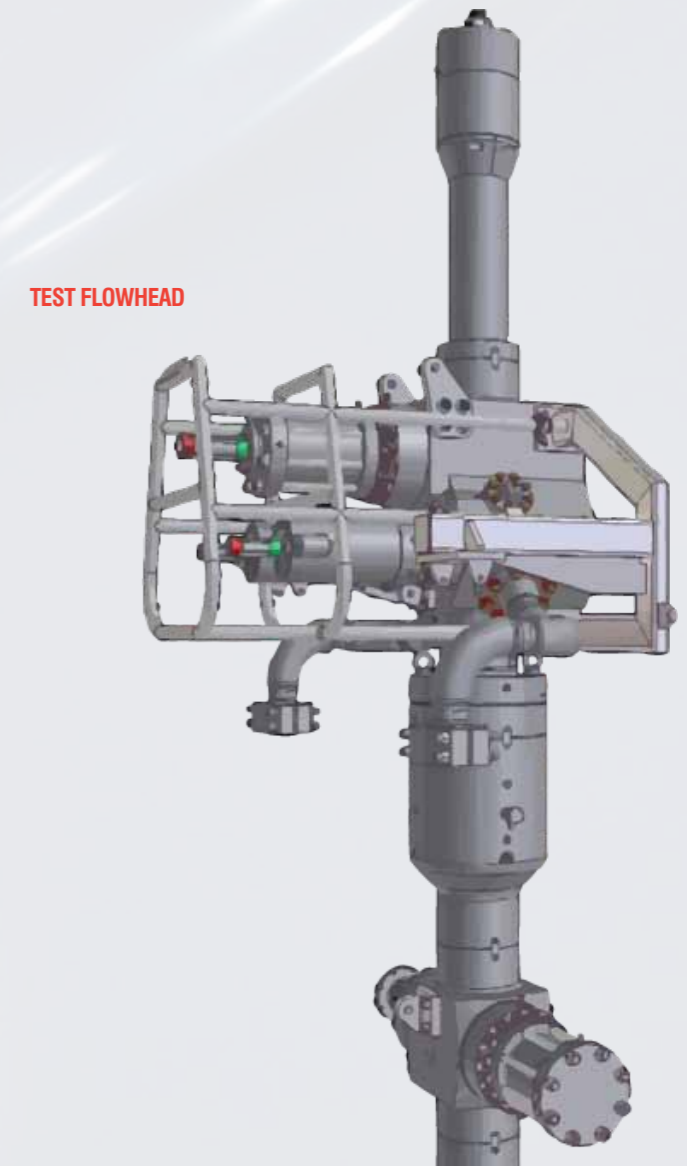
SURFACE TREE



BOP ASSEMBLY



HEAT EXCHANGER – GATE VALVES



TEST FLOWHEAD



SUB SEA TREE

## Pack Sizes Available For All Types Of Injection Equipment

Product	Pack Type	Typical Product Weight/Volume
Valve Lubricant Range	24 cartridges (400g size)	24 x 550 g
	9 x 2kg pot	9 x 2.3 kg
	4 x 5 quart/10lb can	4 x 6 kg
	12.5kg metal pail	12.5 kg
	12.5kg metal pail	18 kg
	US 5 Gallon metal pail	18 kg
	50kg metal keg	50 kg
	50kg metal keg	70 kg
Valve Sealants	180kg metal drum	250 kg
	24 cartridges (400g size)	24 x 525 g
	12.5kg metal pail	12.5 kg
	12.5kg metal pail	18 kg
	US 5 Gallon metal pail	18 kg
601 Fluid	50kg metal keg	70 kg
	12.5kg metal pail	15 kg
	5 litre plastic jerrycan	5 litre
601 Valve Cleaner	205 litre drum (plastic)	200 litre
	25 litre polydrum	25 litre



## Lubricant Injection Equipment

RS Clare's premium valve lubricants are adhesive, viscous lubricants designed for severe operational service conditions. The ability of conventional, air operated, pumping equipment is limited when used with such lubricants, particularly in cold temperatures or when the lubricant is to be pumped over a long distance.

RS Clare offers a comprehensive range of air operated, hydraulically operated and manual pump equipment. These systems are specially configured with the correct connection fittings for optimum lubricant injection and covering all container sizes from cartridges to large drums.

Bespoke systems can also be designed and built, with self-contained skid units for use where central power supply is not available.

HEAVY DUTY PORTABLE PUMP



BESPOKE SYSTEMS



UNIQUE DESIGN  
STROKE COUNTER



PRESSURE PRIMED SYSTEMS



## Training and Support Services

### GLOBAL PRESENCE

Our technical approach to solving customers' problems means that we have gained business globally with National and International Operators and Service Companies. We are able to provide a comprehensive library of field reports, user references and technical data.

RS Clare has offices in the UK & Middle East, and is supported by a network of agents & stockists covering many parts of the world and expanding.

See our website for details.



## RS Clare - Synonymous with Well Integrity

There are many opportunities to question our people on the technical issues faced during your wellhead valve maintenance work. RS Clare present papers at global symposiums and participate in SPE seminars. Our industry experts are on hand to help you make the right decisions in lubrication and maintenance.

### LEARN THE RIGHT APPROACH TO PROTECTING YOUR CRITICAL EQUIPMENT

RS Clare is at the forefront of lubricant technology and can provide crucial understanding for front-line engineers.

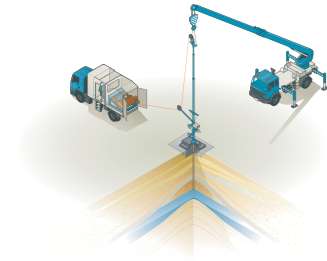
We offer tailor made training courses to educate engineers on Tribology - the science of lubrication, friction and wear. Delivered by our technical experts, the courses provide delegates with a sound background on lubricant chemistry, standard lubricant tests and grease applications relevant to wellhead valve integrity.

Talk to us about having a seminar delivered at your location.



## RS Clare at the forefront of environmentally friendly lubricants

RS Clare is always conscious of the effects its products may have on the environment. In the offshore Oil & Gas sector, Norway has the most stringent environmental regulations globally. When developing new products for oil service companies, where there is a risk of exposure to the environment, we ensure we can meet these high demands.



### WIRELINER FLUIDS

We have built on the successes of our hydrocarbon and H<sub>2</sub>S resistant Valve Lubricant range with the development of V500 Wireline Fluid, a fully synthetic

HOCNF certified Yellow Category fluid. Extensive testing has proven V500 to provide excellent sealing performance. V500 is not prone to polymerisation and helps keep the equipment and rig floor clean.

**V300 RLWI** (Riserless Light Well Intervention) Wireline Fluid, also HOCNF Yellow Category, was developed in association with a leading Subsea Intervention Equipment Manufacturer and is also suitable for low temperature applications.

**V1000** offers excellent corrosion protection in H<sub>2</sub>S environments and is frequently used with Slick line to enhance the service life of the wire and provide protection both running into the well and later when spooled.

**V1500** offers an alternative for hot climates where greater viscosity is demanded.



### WIRELINER PRODUCT TABLE

	Unit	V300 RLWI	V500	V1000	V1500
<b>HOCNF Category</b>		Yellow	Yellow	Not categorised	Not categorised
<b>Base</b>		Fully synthetic	Fully synthetic	Fully synthetic	Semi synthetic
<b>Colour</b>		Colourless to straw yellow	Colourless to straw yellow	Amber	Amber
<b>Dynamic Viscosity @ -10°C</b>	cP	25,000	36,000	45,000	600,000
<b>Dynamic Viscosity @ 0°C</b>	cP	8,700	13,000	19,000	220,000
<b>Dynamic Viscosity @ 25°C</b>	cP	930	1,400	2,600	30,000
<b>Approximate Low Temp Pumpability</b>	°C	-15 to -20	-10 to -15	-10 to -15	5 to 10

## Tradition and Technology



RS Clare was founded in Liverpool in 1748 and is the oldest company manufacturing lubricants in the UK.

Throughout the 19th and 20th centuries we distilled tar, surfaced roads and invented and laid thermoplastic road markings. But we've come a long way. With 50% of our business now exports, we've been awarded **Queen's Award for Enterprise for International Trade**, and been listed in the Sunday Times Top 100 Exporters.

RS Clare has survived for over two and half centuries because we know people will only stay as customers if we continue to satisfy their needs. We have done so with several Major Oil Companies and end - users of specialist lubricants in Upstream O&G, Rail, Automotive and Marine markets.

Our business is built on three principles:

- **People** - our staff, who all matter
- **Partnership** - all our customers, suppliers and stakeholders
- **Progress** - we make it, together



Be it ISO 9001 or ISO 14001, we at R S Clare believe in the pursuit of excellence and endeavour to strive for high standards in all that we do.







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