

Himoloc: Oil & Gas Polymers



Revision: 2010

derypol



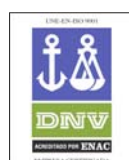
"We make polymers, we care for the environment"

"We make polymers" means that *derypol* works to detect the market needs and to investigate and develop products.

Our concern for the environment has become our main objective; for this reason we only use processes and products that respect the environment.

Our *Oil&Gas* product range is consequence of our loyalty to our objectives of innovation and advanced technology in the development of specialized and sophisticated products. All of them are due to an extensive investigation and are developed following the most demanding excellence and quality criteria.

Dr. Guillem Solé
General Manager



Contents Index

1. Introduction.

1.1. HIMOLOC Technology.

2. Relevant Applications.

2.1. Polyacrylamides in Oil & Gas.

2.2. EOR: Enhanced Oil Recovering.

2.3. Drilling: Perforating Liquids.

2.4. Water Treatment.

3. HIMOLOC Products.

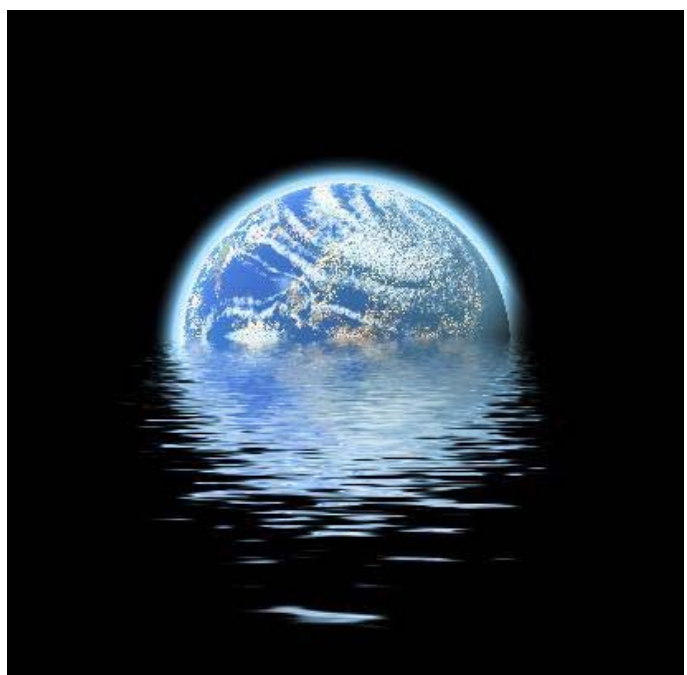
3.1. GO/GA Series.

3.2. DR Series.

3.3. TG/TX Series.

3.4. ZW Series.

4. We are working on...



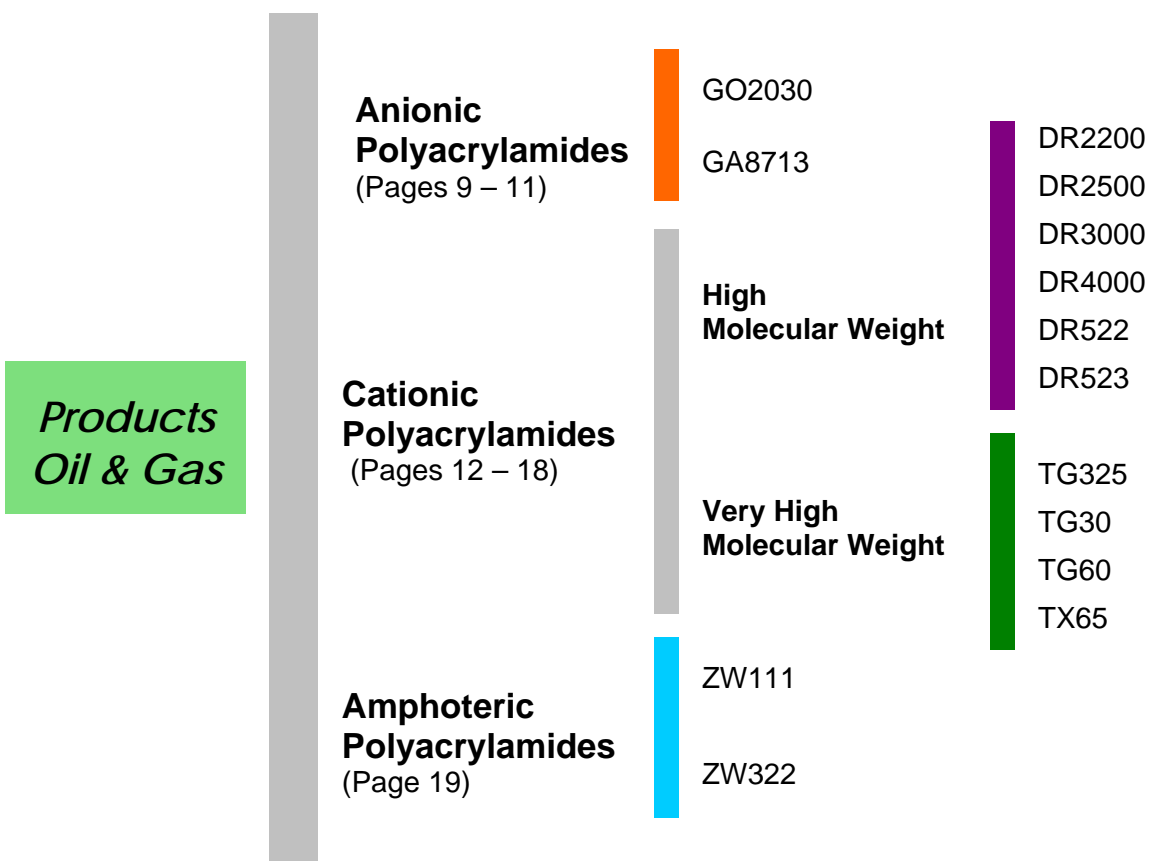
1. Introduction.

1.1. HIMOLOC Technology

In his will of expansion, Derypol has developed a new product range for Oil & Gas industries based in his exclusive HIMOLOC Technology. These products are liquid polyacrylamides with big technologic and environmental advantages.



- Has been **developed in watery solutions**, replacing oils and surfactants with water, avoiding the use of harmful substances.
- **Stable Products**, without phase separation.
- **Low freezing point** compared with the regular emulsions and capable to perform formulations that hold extreme temperatures (<20°C).
- **Able to perform on line dilutions**, moreover it's feasible to apply them directly. Operating Cost reduction.
- **Easy soluble in any type of water**, independently of its quality.



**Products
Oil & Gas**

2. Relevant Applications

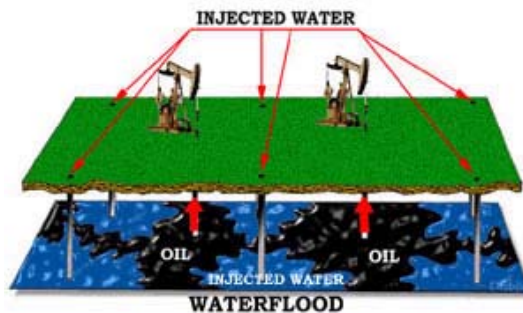
2.1. Polyacrylamides in Oil & Gas



The polyacrylamides are used as additives in many stages of drilling, production, transportation and processing of crude. In particular, are used in enhanced recovery of crude oil, in mixtures for lugging oil and as gels for profile injection control. These same gels are also used for the water and gas production controlling the crude production. Other applications are as additives for drilling mud, in lost circulation systems and during stimulation treatments in fracturing hydraulic gels.

2.2. EOR: Enhanced Oil Recovery

Another important application of the polyacrylamides in the oil industry is the injection of aqueous solutions (WATERFLOODING) as a method of secondary or tertiary crude recovery. This method is based in the injection of pressurised aqueous solutions from external perforations to recover crude by a central perforation. A crude reservoir is formed by a matrix of porous or sandy rock that holds a mixture of crude, water (brine) and gas.



When conducting a drill, the natural pressure of the well provides sufficient force to remove a 20 to 30% of oil content in the formation. One of the most effective techniques to extract the remaining oil is the drag of high viscosity aqueous solutions. This technique is capable of providing an extraction of 70% of the crude in the formation. The role of polyacrylamides in enhanced oil recovery is to increase the viscosity of the aqueous phase. This viscosity increase can improve the efficiency of the crude recovery processes. An adverse mobility relation between crude and water injection may lead to poor surface scanning efficiency associated to a premature appearance of front water in the producers. Polyacrylamides reduce the mobility of the aqueous phase by increasing its viscosity and reducing the permeability of the porous rock.

2.3. Drilling: Perforation Liquids

A drilling liquid is composed of several chemical additives; its main function is to facilitate the drilling of a hole within a reservoir with minimal tool and rock damages.

Polyacrylamides have several functions in the drilling mud.

- VISCOSIFIERS
- Clay Flocculants
- Control of fluid loss. In this case, the polymers help to form a paste on the walls of the formation during the drilling process. This paste prevents migration of drilling fluid to the formation, which prevents the loss of fluid properties and the formation to become corrupted.



2.4. Water Treatment

Whether we refer to the Upstream (Onshore and Offshore) or the Downstream, there is need to treat and improve water quality for use, reuse or for final disposal (waterflooding conditioning, water treatment for lightening of crude tankers, etc.)



The main problem of the treatment to improve water quality in terms of turbidity and undissolved solids (suspended) is related to the elimination of colloidal-sized material. This elimination is performed by physicochemical methods using coagulants and flocculants, where polyacrylamides are very common, as in the dehydration of muds produced during these treatments.

3. HIMOLOC Products

Himoloc products have the advantage of not depending on the quality of the injection water and working with salinities higher than usual polyacrylamide, either emulsions or powder, because the polymer is located in a related habitat (aqueous saline dispersion) and it's not easily degradable.

3.1. GO/GA Series

Very high molecular weight anionic polyacrylamide in aqueous dispersion.

	GO2030	GA8713
Appearance	Milky White Liquid	Milky White Liquid
Density	~1.2g/cm ³	~1.2g/cm ³
Viscosity	<3000cp	<400cp
pH	3.0 - 5.0	3.5 - 6.0
Anionicity	30%	13%
Molecular Weight	Very High	Very High

Highlighting the Himoloc GA8713 product, that withstands extremely high reservoir temperatures (<250 °C) and acid pH (pH>1). Moreover, can be formulated with glycols to withstand extreme low temperature (> -20 °C) and can be dosed directly from the

3.2. DR Series

Middle molecular weight cationic polyacrylamides, specially suitable for the physicochemical water treatment, as they contain a special molecule that facilitates the separation of colloidal material by flotation.

	DR2200	DR2500	DR3000	DR4000	DR522	DR523
Appearance	Milky White Liq.	Milky White Liq.	Milky White Liq.	Milky White Liq.	Milky White Liq.	Milky White Liq.
Density	~1.2g/cm ³	~1.2g/cm ³	~1.2g/cm ³	~1.2g/cm ³	~1.2g/cm ³	~1.2g/cm ³
Viscosity	<2000cp	<500cp	<600cp	<600cp	<1500	<3000
pH	3.0 – 4.5	3.0 – 4.1	3.0 – 4.1	3.0 – 4.1	3.0 – 4.1	3.0 – 4.1
Cationicity	5%	10%	35%	80%	10%	35%
Molecular Weight	High	High	High	High	High	High

This range provides excellent performance in water treatment for the shedding of crude tankers.

3.3. TG/TX Series

Very high molecular weight cationic polyacrylamides

	TG325	TG30	TG60	TX65
Appearance	Milky White Liq.	Milky White Liq.	Milky White Liq.	Milky White Liq.
Density	~1.2g/cm ³	~1.2g/cm ³	~1.2g/cm ³	~1.2g/cm ³
Viscosity	<3000cp	<1500cp	<1200cp	<1700cp
pH	3.0 – 4.5	3.0 – 4.2	3.0 – 4.1	3.0 – 4.2
Cationicity	10%	35%	60%	35%
Molecular Weight	Very High	Very High	Very High	Very High

These series are particularly suitable for the mud dewatering with high speed centrifuge.

3.4. ZW Series

Amphoteric polyacrylamides that combine cationic and anionic charge with the same polymeric structure.

	ZW111	ZW322
Appearance	Milky White Liq.	Milky White Liq.
Density	~1.2g/cm ³	~1.2g/cm ³
Viscosity	<2000cp	<2000cp
pH	3.0 – 4.5	3.0 – 4.2
Effective Cationicity	10%	30%
Molecular Weight	High	High

Amazing stability under extreme conditions and easy to dissolve.

4. We are working on...

We are working hard everyday to be able to offer new **discoveries** so that may:

- 1- Reach more profitable and sustainable treatments.
- 2- Adapt ourselves to the new government demands.
- 3- Contribute to the effort to keeping our planet blue.

Our product range, reflective of our beliefs, is continuously evolving, because we focus our efforts basically on finding new chemicals. Our success is due to our partners, colleagues and customers, and to their spirit of innovation. We understand that our strength is in our research and development of practical application, as well as our focus on meeting the needs of our clients.

To discover means that we have a great ability to adapt to the needs of the market and the customers, thanks to an organization that works with dynamism, creativity, effort, and overall with vision.

Finally, we ask you to just remember our mission statement; *we make polymers, we care for environment.*





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