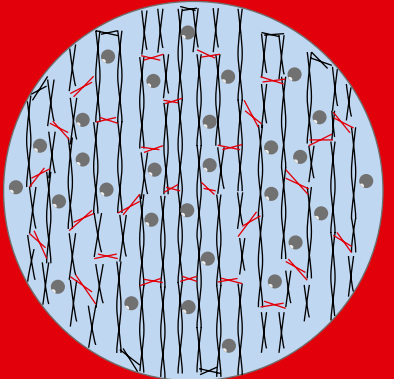


“Caramel” is the most balanced and effective product in the evolutionary line of granulated products manufactured by Mirrico Group of Companies.

The technology of its production allows to create corrosion, scaling and paraffin inhibitors, and complex products. It is a biodegradable polymeric matrix containing molecules of active substance.



Inhibitor's molecules

Weighting material

Crosslinking brodges

The molecules of the inhibitor are cross-linked by cross hydrolyzable bridges, this ensures uniform removal of the molecule;

The degree of cross-linking makes it possible to regulate the rate of removal of a small amount of residual material;

High content of an active base (up to 60%) is possible.

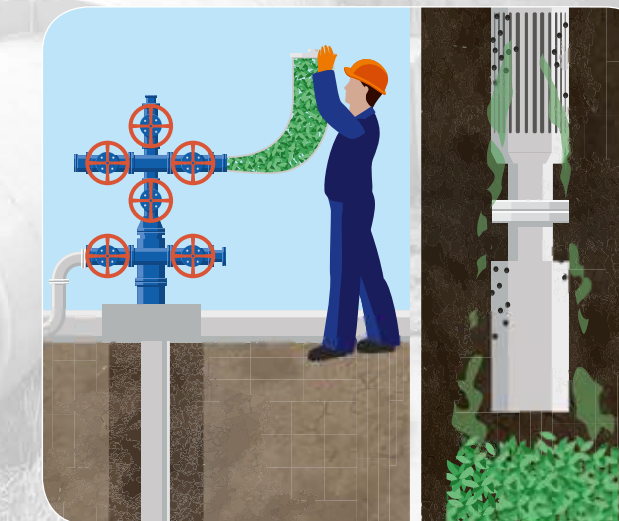
Advantages of granulated products produced by Mirrico Group of Companies

- lack of dosing equipment and the need for its maintenance;
- minimum costs for well treatment;
- reduction of costs for storage and transportation;
- possibility of separation of different reagents: corrosion inhibitor + paraffin inhibitor, corrosion inhibitor + scale inhibitor, etc. ;
- uniform removal of the reagent;
- the ability to control the rate of reagent removal;
- a lower dosage is required as compared to known reagents to achieve a high protective effect;
- high afterdisturbance effect;
- formation of a harder inhibitor film on the metal surface;
- high content of an active base;
- lenient storage requirements in comparison with the requirements to classical reagents;
- ecological safety (absence of contact with methanol).

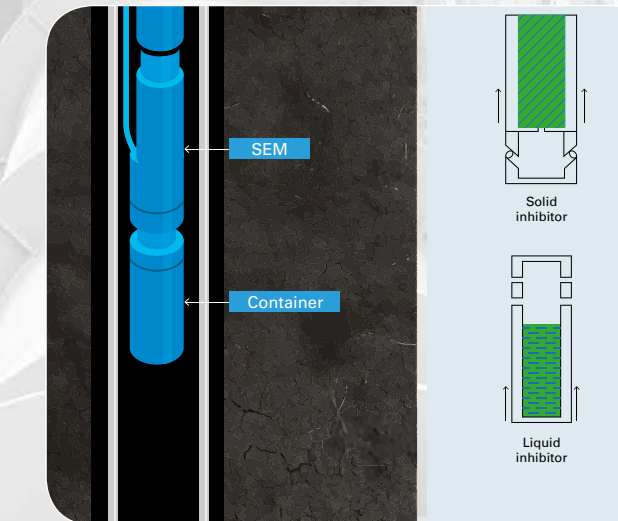
The technology of application of granulated products produced by Mirrico Group of Companies

METHOD 1: nthe product is placed into the annular space of the well, from where it enters the dip hole. Gradually saturating the medium, the inhibitor with the flow of produced water enters the suction pipe of the immersed pumping equipment and further into the wellbore (Fig. 1).

METHOD 2: use of borehole dosing container, including the possibility of placing it under the ESP. The granulated inhibitor in the container with an encapsulated inhibitor can be released in two ways: gravitational flow and diffusion dissolution, which increases the accuracy of dosing.



(Fig. 1).



(Fig. 2)

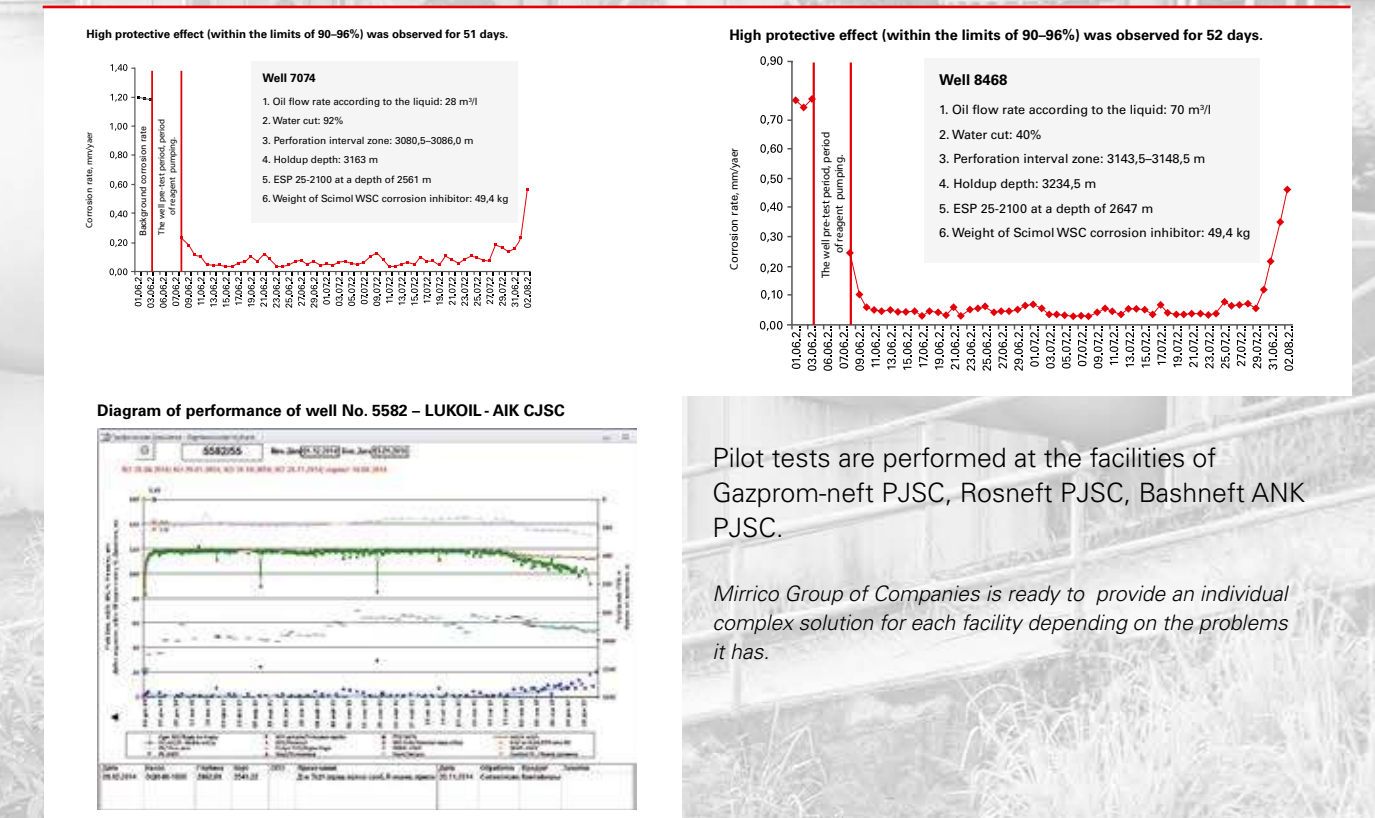
The construction of the container, as well as the type of inhibitor, which is an granulated one, allows to avoid peak removal of the inhibitor at the initial moment of operation, as a result of which the process of release becomes uniform. The use of the container does not complicate installation of the unit and does not require service in the well (Fig. 2).

Innovated granulated products of Mirrico Group of Companies showed a protective effect of about 90–96%.

The efficiency of use of granulated products was confirmed in the course of pilot tests at the facilities of LUKOIL - AIK CJSC.

Tests of Scimol™ WSC granulated corrosion inhibitor in the well showed a protective effect of about 90–96%.

When testing Descum WSC encapsulated scale inhibitor, well performance concerning oil flow rate and pressure was observed.



Mirrigo is a Russian group of engineering and service companies. Its main activities include production and supply of chemical reagents for industrial markets, engineering support for customers concerning the use of chemical solutions, and services.

ISO 9001: 2008 quality management system, which is implemented and operated in all subsidiary companies of the Group, confirms stability and guarantees high quality of products.

Owing to serious investments in research and development, Mirrigo Group of Companies creates unique products and technologies outrunning their market analogues. Today the Group of companies sets itself a task to offer the best solutions at the lowest prices to the consumers.

Innovative products of Mirrigo Group of Companies*

Project: granulated products.

Goal: to produce a set of products with a long-term effect. Such property will reduce the dosage of the reagent, and to abandon the use of dosing equipment upon one-time treatment in the future.

From “capsules” to “caramel” Evolution of granulated products produced by Mirrigo Group of Companies

Stage I — «capsules»: Scimol WSC HT — Corrosion inhibitor to be used in the wells with elevated temperatures (from +25°C).

Stage II — «sponge»: Scimol WSC LT — Corrosion inhibitor to be used in wells with low temperatures (from +3°C).

Stage III — «caramel»:
• Descum WSC — scaling inhibitor,
• Sedics WSC — multi action reagent — corrosion and scaling inhibitor.

Prospects: development of granulated products for control of deposits of asphalts, resins, and paraffins, and of complex products.



* Developed in the research and development center of Mirrigo Group of Companies, Kazan, Russia.

Innovative resources of Mirrigo Group of Companies

The research and development center of Mirrigo Group of Companies is a complex of research and testing laboratories. The research and development center makes developments in different fields of activity of Mirrigo Group of Companies and conducts technical support of products and technologies at customers' facilities.

An important goal of the research and development center of Mirrigo Group of Companies is collaboration with customers concerning bringing the applied solutions to the changed conditions and processes and develop products, which are not in the market.

A wide laboratory base of the research and development center allows to achieve effectively the set goals, Group's own production facilities shorten the terms for obtaining a pilot batch of a new product for its subsequent testing at real facilities of the customers.

Laboratory of the research and development center of Mirrigo Group of Companies covers an area of more than 2000 square meters.

GRANULATED PRODUCTS PRODUCED BY MIRRICO GROUP OF COMPANIES

PROLONGED ACTION
REAGENTS FOR CORROSION
AND SCALE INHIBITION