

AP COMPLEX

The background of the entire page is a laboratory scene. At the top, a pipette is shown dispensing a drop of liquid into a glass flask. Below this, two larger Erlenmeyer flasks are visible. The flask on the left is partially filled with a dark liquid. The flask on the right is empty and has volume markings (150, 200, 250, 300) and is covered in condensation droplets. The overall color palette is a mix of light and dark greens, with a white diagonal band separating the top text from the bottom text.

**Innovative solutions
in the field
production of industrial
chemicals**

2024

Corrosion inhibitors series «Unikor-3»

Documents for products: Technical conditions / MSDS / SEE conclusion / Passport of quality



APPOINTMENT:

- for the protection of underground and surface equipment of oil and gas production wells, installations and pipelines from atmospheric, oxygen, carbon dioxide, hydrogen sulfide and general acid corrosion
- have increased lubricating properties and are used as additives to mineral lubricants in simple units

PRINCIPLE OF ACTION:

- form a protective film on the walls of the equipment that prevents corrosion
- act as absorbers of acidic components of well products

SCOPE OF APPLICATION:

- closed cycle systems at oil and gas sector production and processing facilities (oil and gas installations, production wells, pipelines, transportation systems, liquid hydrocarbon storage systems, formation and wastewater disposal systems, etc.

Characteristics of the products of the line

| Indicator | Name of product | | | | | | | | | | Control method |
|---------------------------------------|--|-------------|--|-------------|-------------|-----------|--|-------------|-------------|----------|-----------------------|
| | Unikor-3.01 | Unikor-3.02 | Unikor-3.03 | Unikor-3.04 | Unikor-3.05 | Unikor-3C | Unikor-3.06 | Unikor-3.07 | Unikor-3.08 | Unikor-3 | |
| Appearance | Liquid from transparent to light brown color | | Liquid from transparent to brown color | | | | Liquid from yellow to dark brown color | | | | according to item 6.2 |
| Density, g/cm ³ | 0,810-0,960 | | | | | | | | | | item 6.5 |
| Kinematic viscosity at (20±1) °C, cSt | 8,0-25,0 | | 10,0-32,0 | | | | | | | | item 6.7 |
| pH, not lower than | 7,0 | | | | | | | | | | item 6.3 |
| Freezing point, °C, not higher | - 25 | | | | | | | | | | item 6.6 |
| Protective effect*, %, not less than | 80 | | 90 | | | | 80 | | | | item 6.4 |

* The efficiency of the products of the line approved by TU. Efficiency tests were carried out in accordance with GOST 9.506-87, and in accordance with the standards and requirements for the aggressive environment from the profile mining enterprises of Ukraine.

Composition of the products of the line

| Name of the inhibitor | Composition | Type of corrosion | Solubility | | | |
|--|---|---|------------|-------------|----------|-------|
| | | | HC | aromatic HC | alcohols | water |
| Unicor-3.01 and 3.02 | Solution of anti-corrosion additives and surfactants of ionic and non-ionic types in alcohols | O ₂ , CO ₂ , H ₂ S | - | - | + | + |
| Unicor-3, 3C, 3.03, 3.04 and 3.05 | Mixture of complex amines, fatty acids and surfactants in combination with solvents of organic origin | O ₂ , CO ₂ , H ₂ S | + | + | + | - |
| Unicor-3.06 | Acid corrosion inhibitor, fatty amines | Water solutions HCl | - | - | + | + |
| Unicor-3.07 and 3.08 | Solution of a mixture of fatty amino acids and surfactants in organic solvents | O ₂ , CO ₂ , atmospheric | + | + | - | - |

The actual efficiency in different model environments

| Type of corrosion | Model environment | C, ppm | Tenv, °C | texpos, h | The method of inhibition | Electro-chem. method* Z, % | Grav. method** Z, % |
|--|--|--------|----------|-----------|--------------------------|----------------------------|---------------------|
| O₂, CO₂ | 80% (Water + 30 mg/l NaCl + CH ₃ COOH (up to pH=4,0) + Diesel 20% | 150 | +60 | 6 | injection | Not lower 96,0 | Not lower 90,0 |
| O₂, CO₂, H₂S | 80% (Water + (3% NaCl + HCl (up to pH 3,5÷4) + 2 g/l H ₂ S) + Diesel 20% H ₂ S gas was obtained from by FeS and HCl reaction: FeS+2HCl=FeCl ₂ ↓+H ₂ S↑ | 150 | +60 | 6 | injection | Not lower 98,0 | Not lower 90,0 |
| Water solutions HCl | 15% water solution HCl | 1000 | +60 | 6 | injection | Not lower 85,0 | Not lower 80,0 |

* Electrochemical studies were carried out using a corrosimeter with bimetallic electrodes.

** Gravimetric studies were carried out in a hermetic glass autoclave at a temperature of +60 °C, with constant stirring on a magnetic stirrer. The samples are immersed in the corrosion solution in proportion to the content of the model medium so that ¼ of the sample is in the hydrocarbon phase, and ¾ is in the electrolyte for 6 hours

Foam characteristics *

| C, ppm Unicor-3, 3C, 3.01..3.08 | V of foam, ml | Tendency to foaming |
|------------------------------------|---------------|---------------------|
| Without inhibitor | 120 | Low |
| 200 | 130 | Low |
| 500 | 100 | Low |
| 1000 | 100 | Low |
| 2000 | 100 | Low |

* Testing was carried out on a 25% solution of DEA in water. The initial test volume of liquid, which was taken as "0" – 100 ml.

Emulsifying ability *

| Indicator | C, ppm Unicor-3, 3C, 3.01..3.08 | | | | | | |
|---------------------------------------|------------------------------------|------|------|------|------|------|------|
| | Without inhibitor | 100 | 200 | 500 | 1000 | 2000 | 5000 |
| Separation time, min | 1 | 2 | 4 | 6 | 10 | 15 | 20 |
| The nature of phase separation | full | full | full | full | full | full | full |

* Testing was carried out in an environment of i H₂O + Diesel (50/50).

Inhibitors, depressors, inhibitors-modifiers and solvents of ARPSs series «Unicor-6»

Documents for products: Technical conditions / MSDS / SEE conclusion / Passport of quality



APPOINTMENT:

- to prevent asphaltene and paraffin deposits in oilfield equipment and pipelines during oil production and transportation
- to combat existing deposits
- for modification of solvents of paraffins
- have hydrogen sulfide corrosion inhibitor properties
- improve rheological properties of paraffinic hydrocarbons and ensure proper condition of commercial hydrocarbon

PRINCIPLE OF ACTION:

- form a protective film on the walls of the equipment that prevents deposits
- and/or act as depressors and solvents of resinous and paraffin components of well products

SCOPE OF APPLICATION:

- closed cycle systems at oil and gas production and processing facilities (oil and gas installations, production wells, pipelines, transportation systems, liquid hydrocarbon storage systems, etc.

Characteristics of the products of the line

| Indicator | Name of products | | | Control method |
|--|--|--|---|-----------------------|
| | Inhibitors of ARPSs Unicor-6.01-6.06 | Inhibitors-modifiers of ARPSs Unicor-6.07-6.08 | Solvents of ARPSs Unicor-6.09-6.11 | |
| Appearance | Liquid from transparent to light brown color | | Liquid from transparent to yellow color | according to item 6.2 |
| Density, g/cm³ | 0,800-0,960 | | 0,810-0,920 | item 6.5 |
| Kinematic viscosity at (20±1) °C, cSt | 8,0-32,0 | | 8,0-25,0 | item 6.7 |
| pH, not lower than | 5,0 | | | n.6.3 |
| Freezing point, °C, not higher | - 15 | | - 20 | item 6.6 |
| Protective effect*, %, not less than | 80 | | Not regulated | item 6.4 |

* **The efficiency of the products of the line approved by TU.** The efficiency test was carried out with a deviation from the standard, in order to obtain stricter conditions, the gas-condensate medium in the flasks was heated to +22 °C, the rods were cooled to a temperature of (minus) -3 °C. That is, the standard temperature difference was 25 degrees, and not 10, as described in the "COLD FINGER" method (gas condensate - 5 °C above the solidification temperature, and rods - 5 °C below the solidification temperature).

The total inhibitor consumption per ton of paraffinized condensate does not exceed 300-1000ppm.

Composition of the products of the line

| Name of the inhibitor | Composition |
|---|---|
| Inhibitors Unicor-6.01 and 6.02 | Composition of nonionic surfactants in aliphatic alcohols and aromatic solvents |
| Inhibitors-depressors Unicor-6.03 and 6.04 | Composite mixture of surfactants and polymers in solvents that have depressant properties |
| Inhibitors Unicor-6.05 and 6.06 | Composite mixture of surfactants, organic compounds of the alkene series and fatty acids in solvents, have properties of depressor |
| Inhibitors -modifiers Unicor-6.07 and 6.08 | Solutions of mixtures of organic and nonionic surfactants in organic solvents. Concentrated form of active base used to improve the efficiency of base solvents of ARPSs involved in oil and gas production processes |
| Solvents of ARPSs Unicor-6.09..6.11 | Solution of aromatic hydrocarbons in combination with synthetic surfactants |

Solubility of the products of the line

| Solvent | Name of products | | | | | |
|-----------------|------------------|--------------|-------------|-------------|-------------|-------------------|
| | Unicor-6.01 | Unicor -6.02 | Unicor-6.03 | Unicor-6.04 | Unicor-6.05 | Unicor-6.06..6.11 |
| Diesel | dispersion | yes | yes | yes | yes | yes |
| Methanol | yes | yes | yes | no | yes | no |
| Solvent | no | yes | yes | yes | emulsion | yes |

Aromatic class hydrocarbons are used as paraffin solvents. The optimal proportion of solvent for dissolving paraffin is 1:5 without adding an inhibitor.

To ensure economy of solvents of the aromatic series, it is proposed to use a 0.5-1.0% solution of modifiers in aromatic hydrocarbons, which allows to reduce the solvent consumption by more than 2.5 times, reduce the reaction time of dissolving paraffins, and consequently the time for the unit operation.

Foam characteristics *

| C, ppm Unicor-6.01..6.11 | V of foam, ml | Tendency to foaming |
|-----------------------------|---------------|---------------------|
| Without inhibitor | 120 | Low |
| 200 | 130 | Low |
| 500 | 100 | Low |
| 1000 | 100 | Low |
| 2000 | 100 | Low |

* Testing was carried out on a 25% solution of DEA in water. The initial test volume of liquid, which was taken as "0" – 100 ml.

Emulsifying ability *

| Indicator | C, ppm Unicor-6.01..6.11 | | | | | | |
|--------------------------------------|-----------------------------|------|------|------|------|------|------|
| | Without inhibitor | 100 | 200 | 500 | 1000 | 2000 | 5000 |
| Separation time, min | 1 | 2 | 4 | 6 | 10 | 15 | 20 |
| Th nature of phase separation | full | full | full | full | full | full | full |

* Testing was carried out in an environment of i H₂O + Diesel (50/50).

Foam formers series «Unikor-10»

Documents for products: Technical conditions / MSDS / SEE conclusion / Passport of quality



APPOINTMENT:

- for carrying out activities and works on complete cleaning and restoration of filtration properties of the near-bottom zone of the formation due to foaming of highly mineralized water-gas-condensate mixtures
- for the processes of construction, operation and repair of wells, extraction and transportation of oil and gas
- as components of process fluids and special mixtures in oil production

PRINCIPLE OF ACTION:

- a micellar layer is formed on the surface of liquid molecules, which allows to improve the rheological properties of formation liquids, reduce the interfacial surface tension and improve their removal to the surface

SCOPE OF APPLICATION:

- closed cycle systems at oil and gas production and processing facilities (oil and gas installations, production wells, pipelines, transportation systems, etc.).

Characteristics of the products of the line

| Indicator | Name of products | | | Control method |
|--|--|-----------------|--|--|
| | A200 Unicor-10 | A300 Unicor -10 | K200 Unicor -10 | |
| Appearance | Liquid from transparent to light yellow color without inclusions | | Liquid from light yellow to brown color without inclusions | item 6.2 |
| Indicator of the concentration of hydrogen ions pH (5% water solution), units. pH | 4,5-9,5 | | 4,5-8,5 | according to DSTU 2207.1 |
| Density, g/cm³ | 0,900-1,060 | | 0,800-1,050 | according to DSTU 7261 |
| Freezing point, °C, not higher | 0 | | - 15 | according to DSTU 20287 |
| Mass fraction of the active base, % | 15,0-40,0 | 5,0-20,0 | 15,0-40,0 | item 6.5 |
| Kinematic viscosity at (20±1) °C, cSt | 8-40 | | | According to the methods developed in the laboratories |

Composition and solubility of the products of the line

| Name of products | Composition | Solubility | | | | Working concentration, % |
|-----------------------|--|------------|-------------|----------|-------|--------------------------|
| | | HC | aromatic HC | alcohols | water | |
| Unicor-10 A200 | Solution of a mixture of target, stabilizing and strengthening surfactants in solvents | - | - | + | + | 0,025-0,2 |
| Unicor-10 A300 | Solution of a mixture of target, stabilizing and strengthening surfactants in solvents | - | - | + | + | 0,1-0,3 |
| Unicor-10 K200 | Solution of a mixture of target, stabilizing and strengthening organic surfactants in organic solvents | + | + | + | - | 0,2-1,0 |

Indicators of the value of surface tension when using products of the line

| C, % | The studied surfactant, $\sigma \cdot 10^{-3}$, N/m | | |
|--------------|--|-----------------|-------------------------|
| | Unicor -10 A200 | Unicor -10 A300 | Unicor -10 K200 |
| | Medium - water | | Medium – gas condensate |
| 0 | 71,8 | 71,8 | 30,2 |
| 0,025 | 28,31 | - | - |
| 0,05 | 27,3 | - | - |
| 0,1 | 26,4 | 28,22 | - |
| 0,2 | 26,3 | 27,4 | 27,21 |
| 0,3 | 26,08 | 26,3 | 26,11 |
| 0,5 | - | 26,28 | 24,07 |
| 1 | - | 26,14 | 22,04 |

Test of emulsifying properties in the «Water-Hydrocarbons» system

| СПАР, 1,0% | Name of products | | |
|---------------------------------------|------------------|-----------------|-----------------|
| | Unicor -10 A200 | Unicor -10 A300 | Unicor -10 K200 |
| Separation time, min | 10 | 30 | 2 |
| The nature of phase separation | full | full | full |

This series is presented in the form of surfactants of different nature (organic and inorganic) and different molecular mechanism products (ionic and non-ionic).

Technological types of surfactants were used in the production of these products in various combinations.

The amount of active basis in the construction of the technical and economic model of the use of surfactants can be changed and balanced according to the wishes of the Customer.



Address: 08400, Ukraine,
Kyiv region, Pereyaslav,
13 Shevchenko Taras str.



066 190 84 66

Identification code: **37717908**