



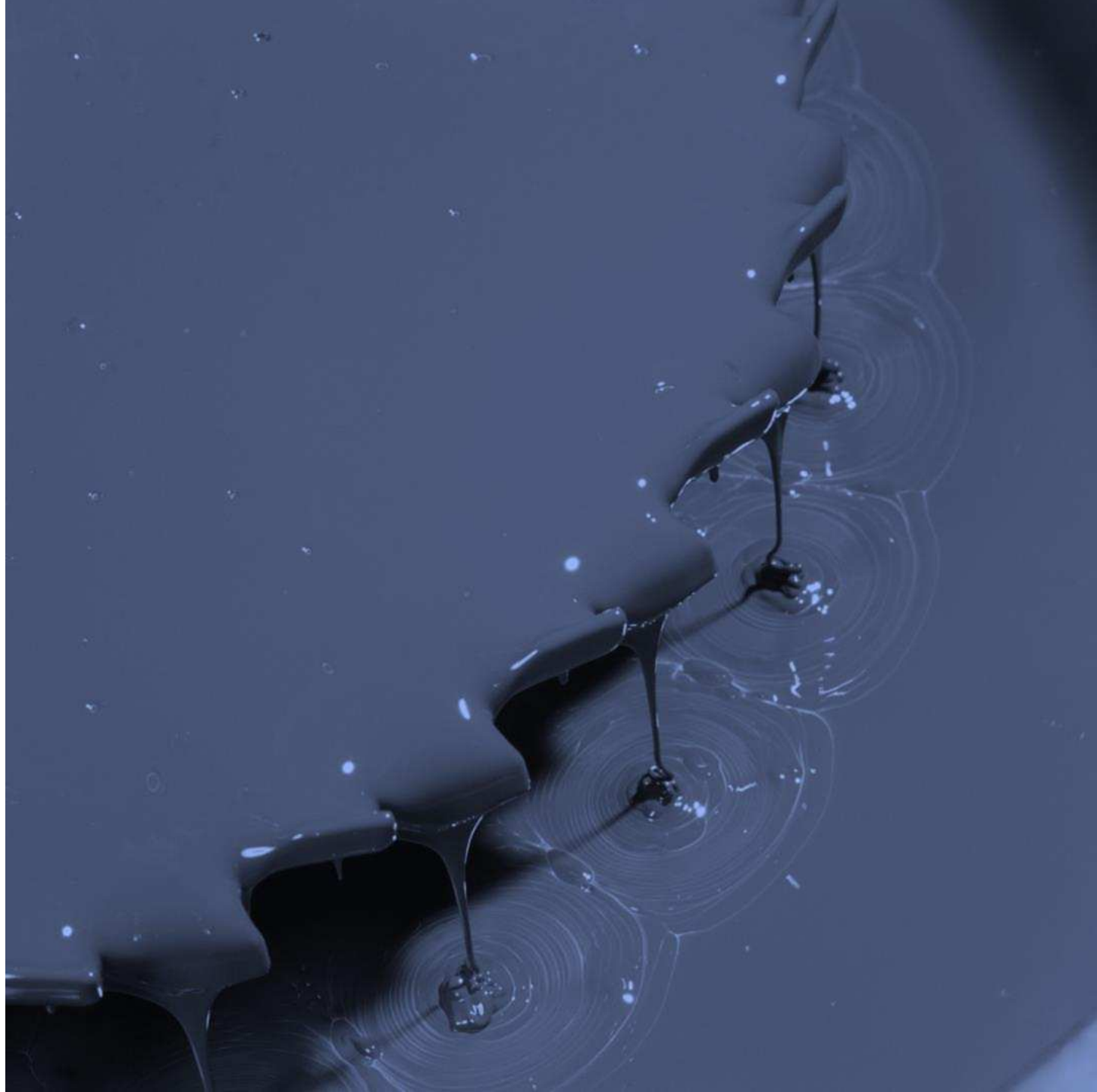
# Multifunctional wetting agents for waterborne paints

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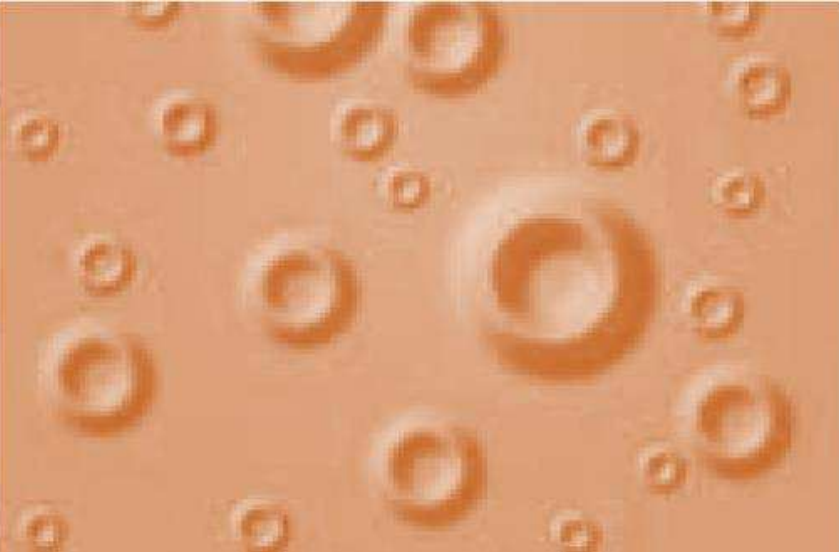


**There are currently thousands of different functional paint additives. Requirements for coatings are becoming higher, so additive synthesis technologies are becoming more complex.**

**Modern paint coating is a complex combination of various components. The correct selection of these components ensures the quality and durability of the coating.**



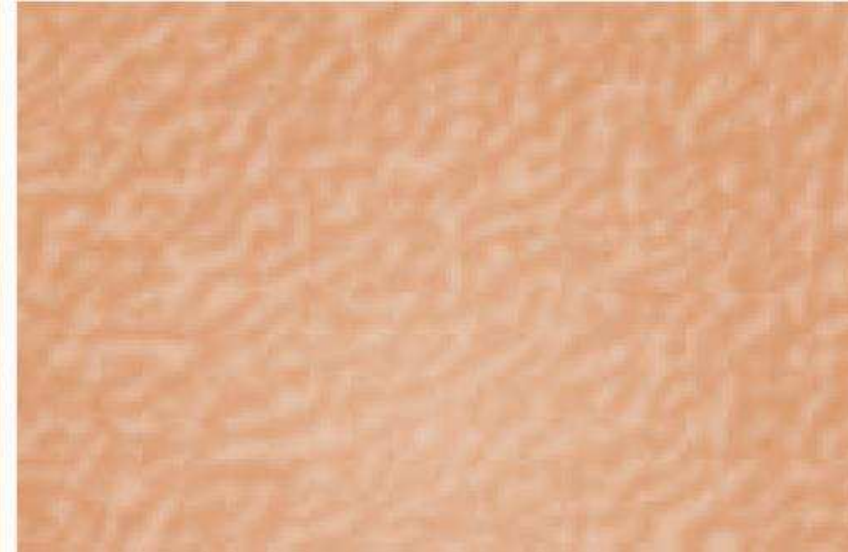
# Most common surface wetting problems



**Craters**



**Film retraction**

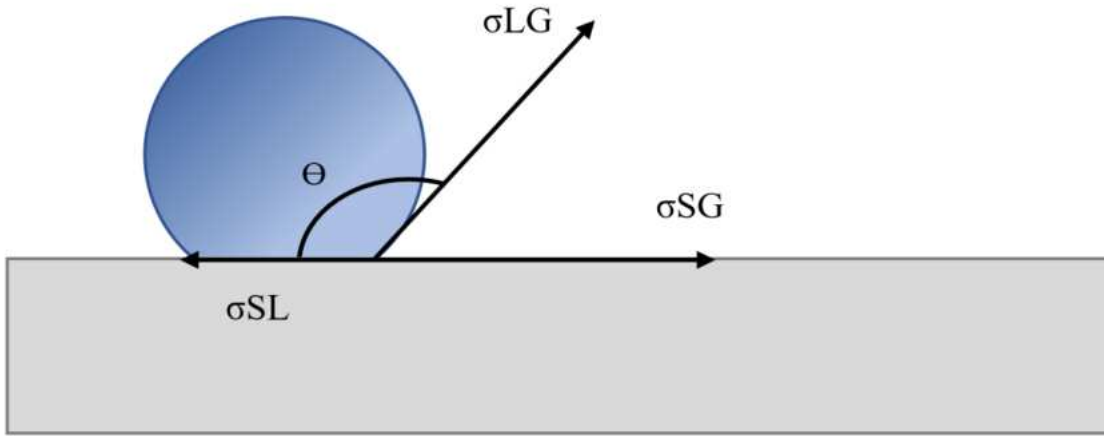


**Orange peel**

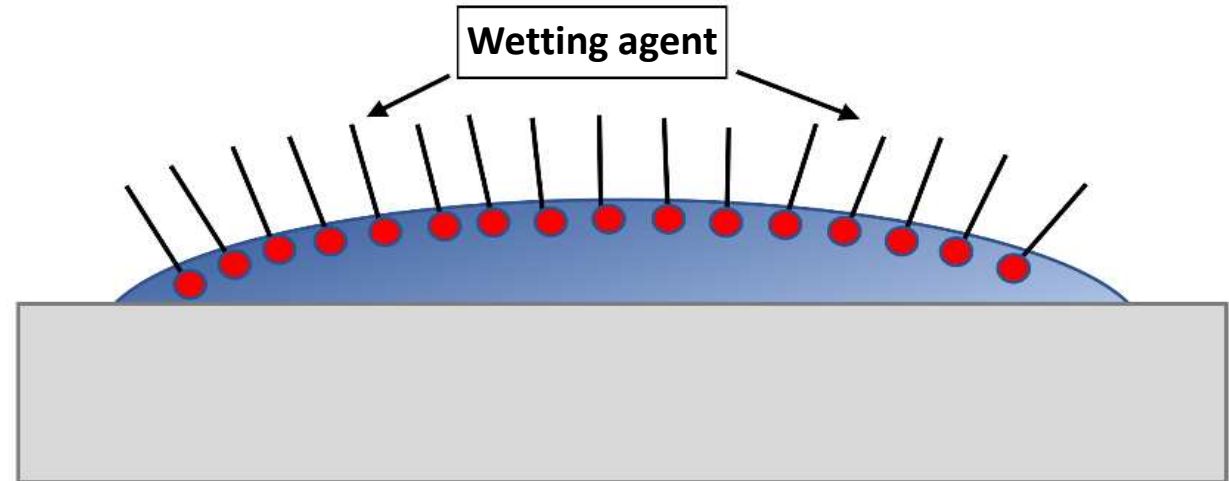
**Which product should you choose?**



# Wetting agents



$$\sigma_{LG} + \sigma_{SL} > \sigma_{SG}$$



$$\sigma_{LG} + \sigma_{SL} < \sigma_{SG}$$

$\sigma_{LG}$  - Surface tension of liquid (liquid-air interfacial tension)

$\sigma_{SG}$  - Surface energy of solid (solid-air interfacial tension)

$\sigma_{SL}$  - Solid-liquid interfacial tension

# Main types of wetting agents for waterborne coatings

## Ethoxylated fatty alcohols

- Isotrideceth-3...8
- Laureth 2...7
- ethoxylated alkylphenols

01

## Salts of sulfosuccinic acid esters

- disodium laureth sulfosuccinate
- Sodium
- dioctyl sulfosuccinate

02

## Silicone wetting agents

- siloxanes modified with polyesters
- trisiloxane ethoxylate

03

# Parameters for assessing the effectiveness of wetting agents

Minimum surface tension of the solution



Effective dosage

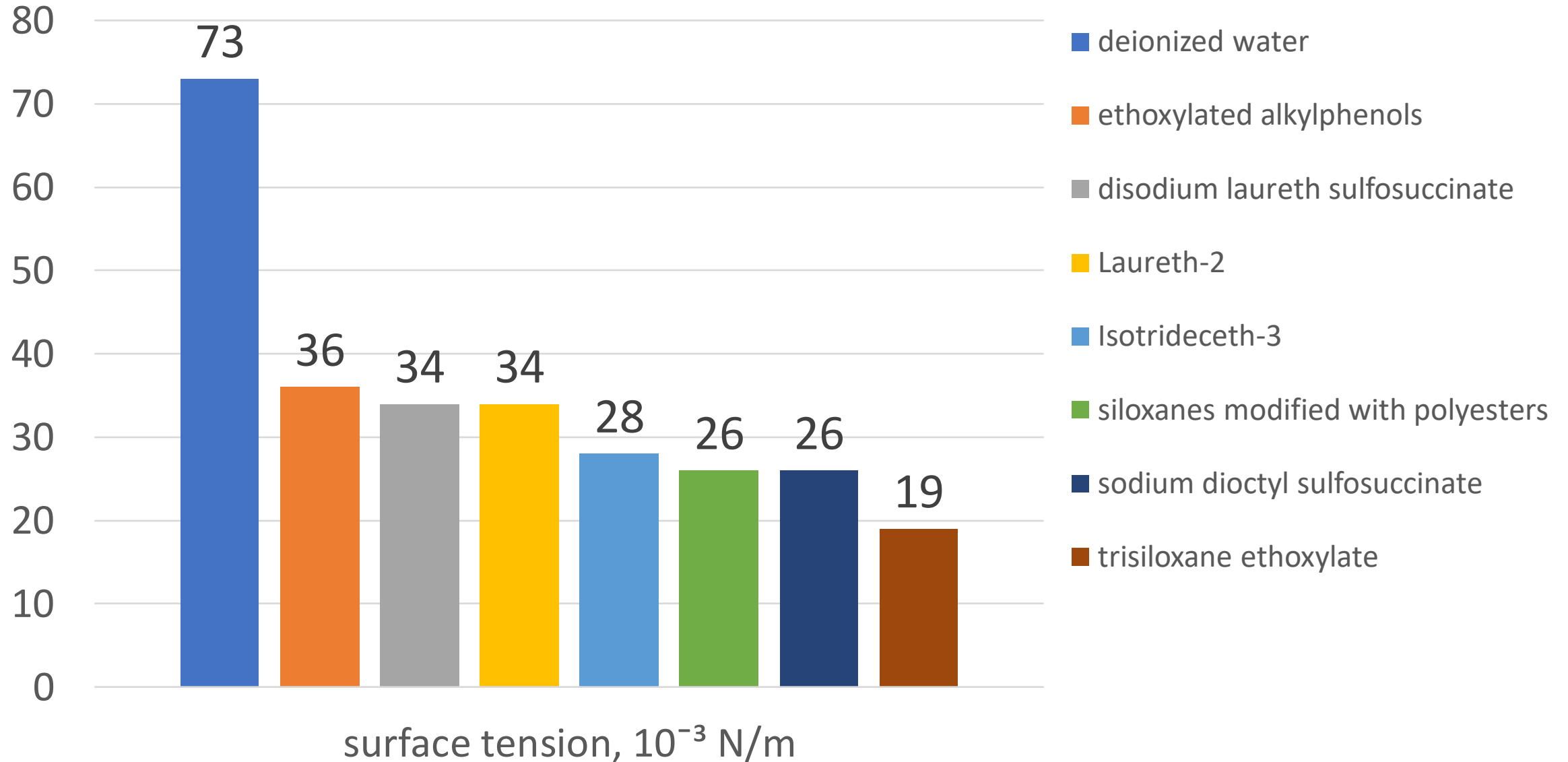
Surface wetting speed



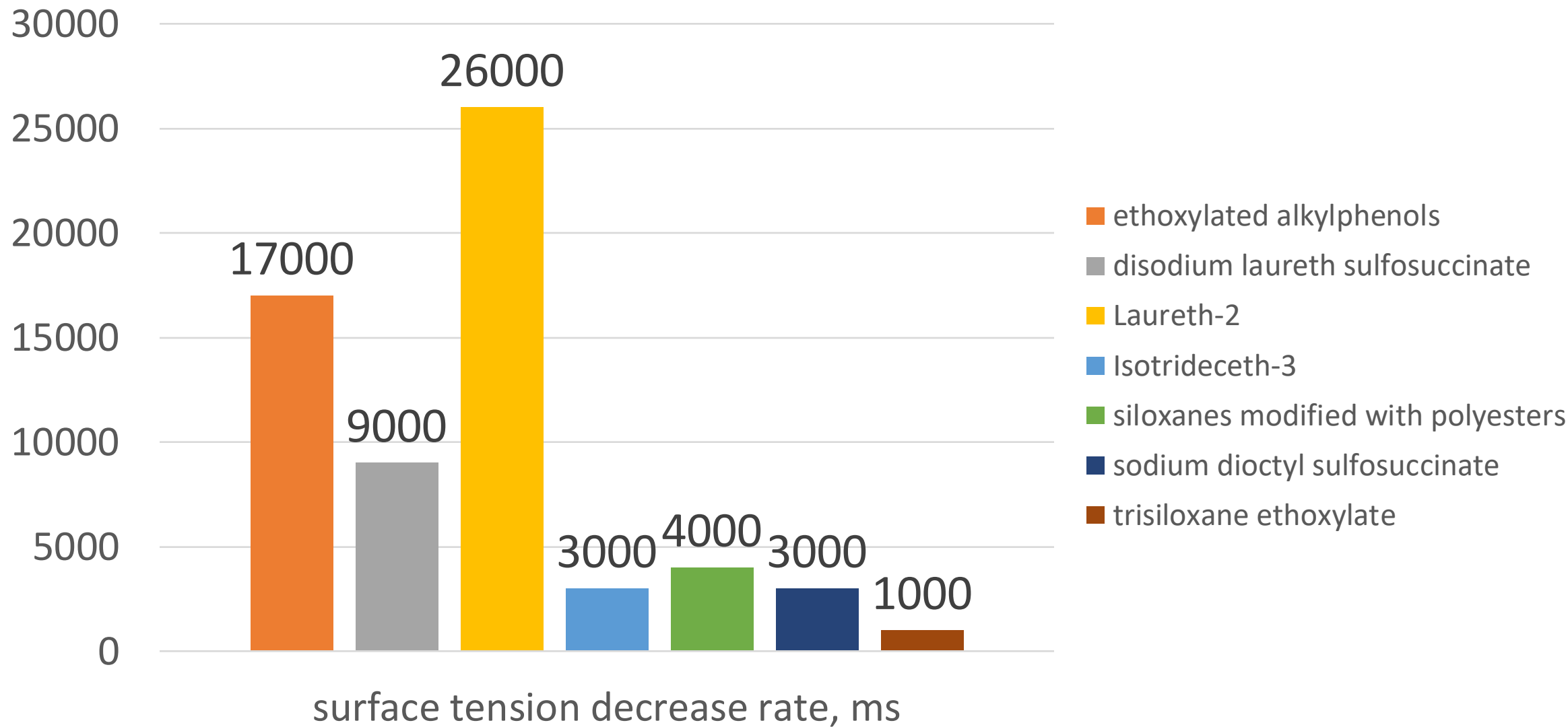
Effect on surface quality



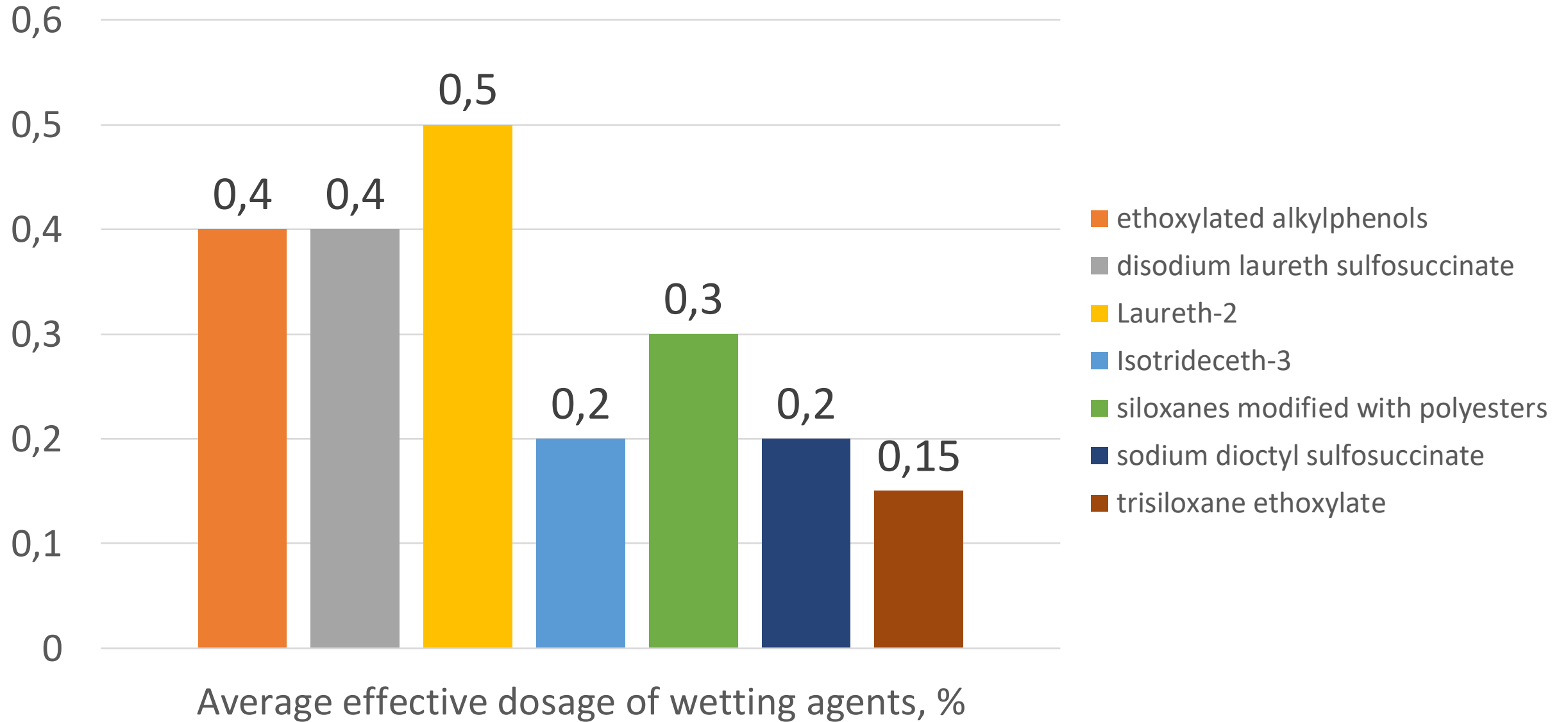
# Minimum level of surface tension of 0,5% aqueous solutions



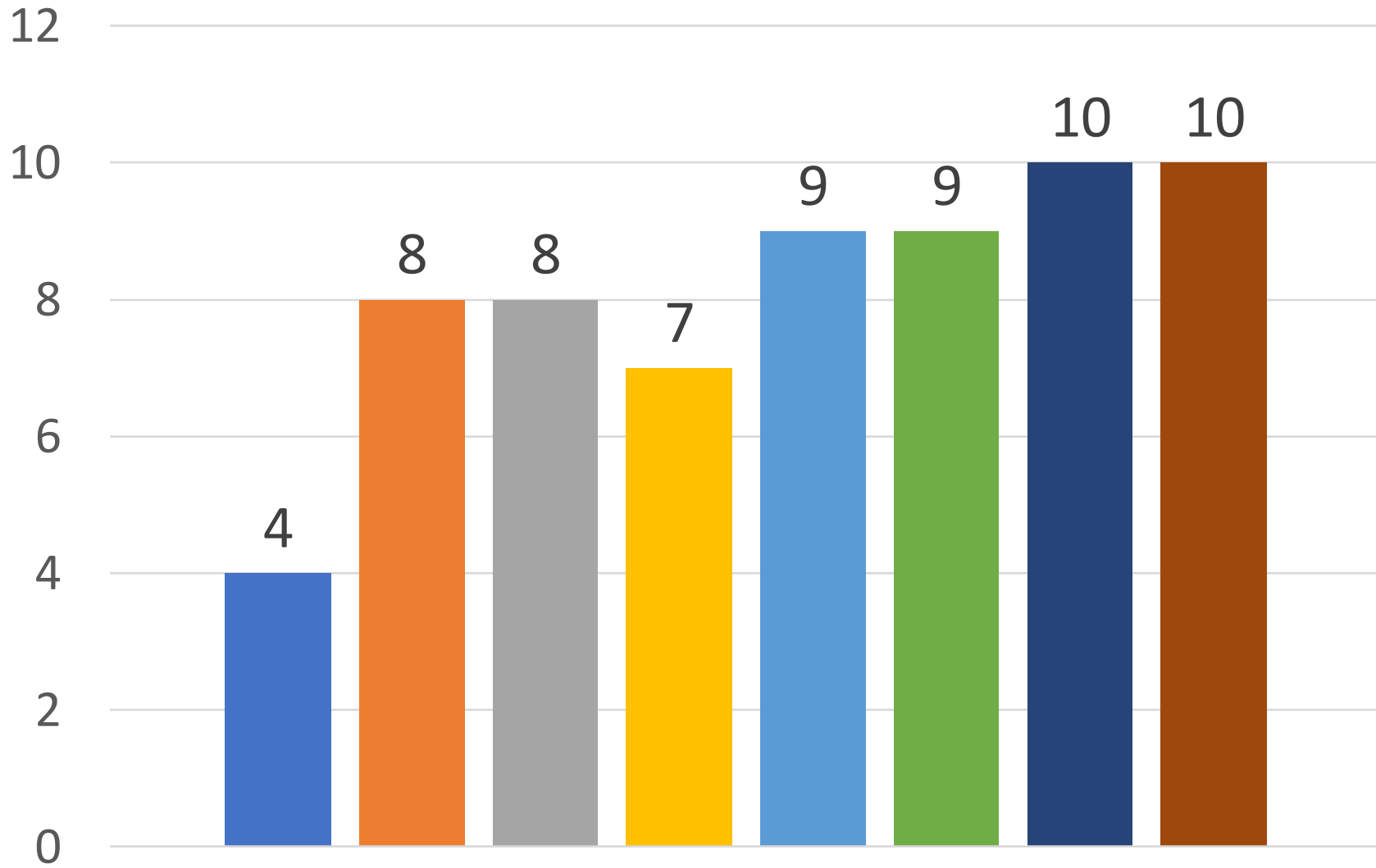
# The rate of decrease dynamic surface tension to a minimum, at a dosage of 0.5%



# Average effective dosage for use in waterborne paints, %



# Surface quality on a 10-point scale



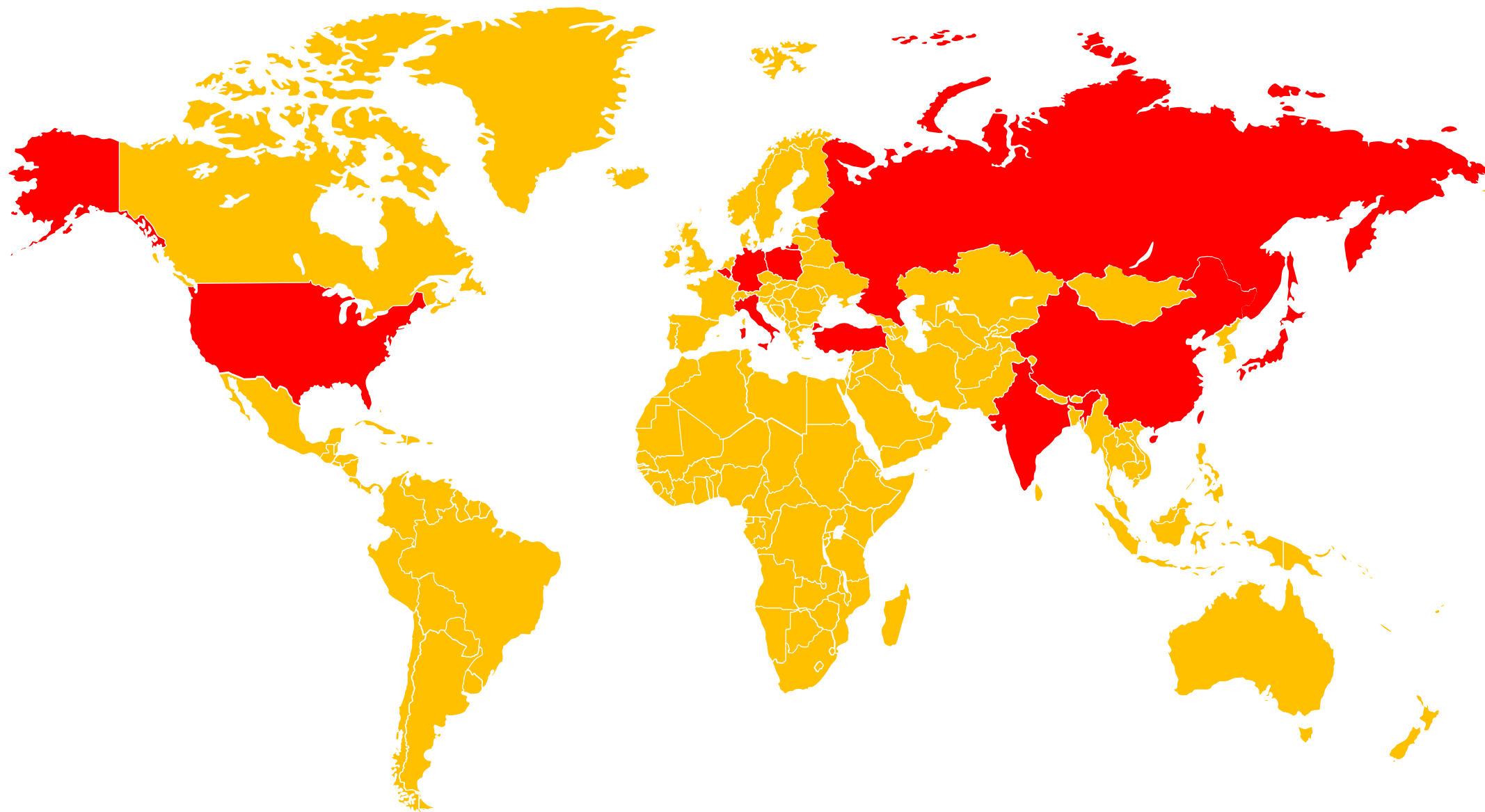
- without wetting agent
- ethoxylated alkylphenols
- disodium laureth sulfosuccinate
- Laureth-2
- Isotrideceth-3
- siloxanes modified with polyesters
- sodium dioctyl sulfosuccinate
- trisiloxane ethoxylate

Surface quality, points

# The main requirements for a wetting agent

- **Uniformity of paint application to the surface;**
- **Low foaming;**
- **Wetting agent compatibility with other paint components;**
- **Formation of a coating without defects;**
- **Low toxicity.**

# Main manufacturers of wetting agents



# Main manufacturers of wetting agents

- Turkey (Sinotek Company);
- Russia (SynoTech LLC);
- China (10+ Companies);
- USA (DOW Chemical, Huntsman);
- India (Indofil Industries Ltd);
- Germany (BASF, BYK Chemie, Münzing);
- Poland (PCC Group);
- Italy (SABO);
- Belgium (Solvay);
- Japan (San nopro, KAO)

$\sigma, 10^{-3}\text{N/m}$

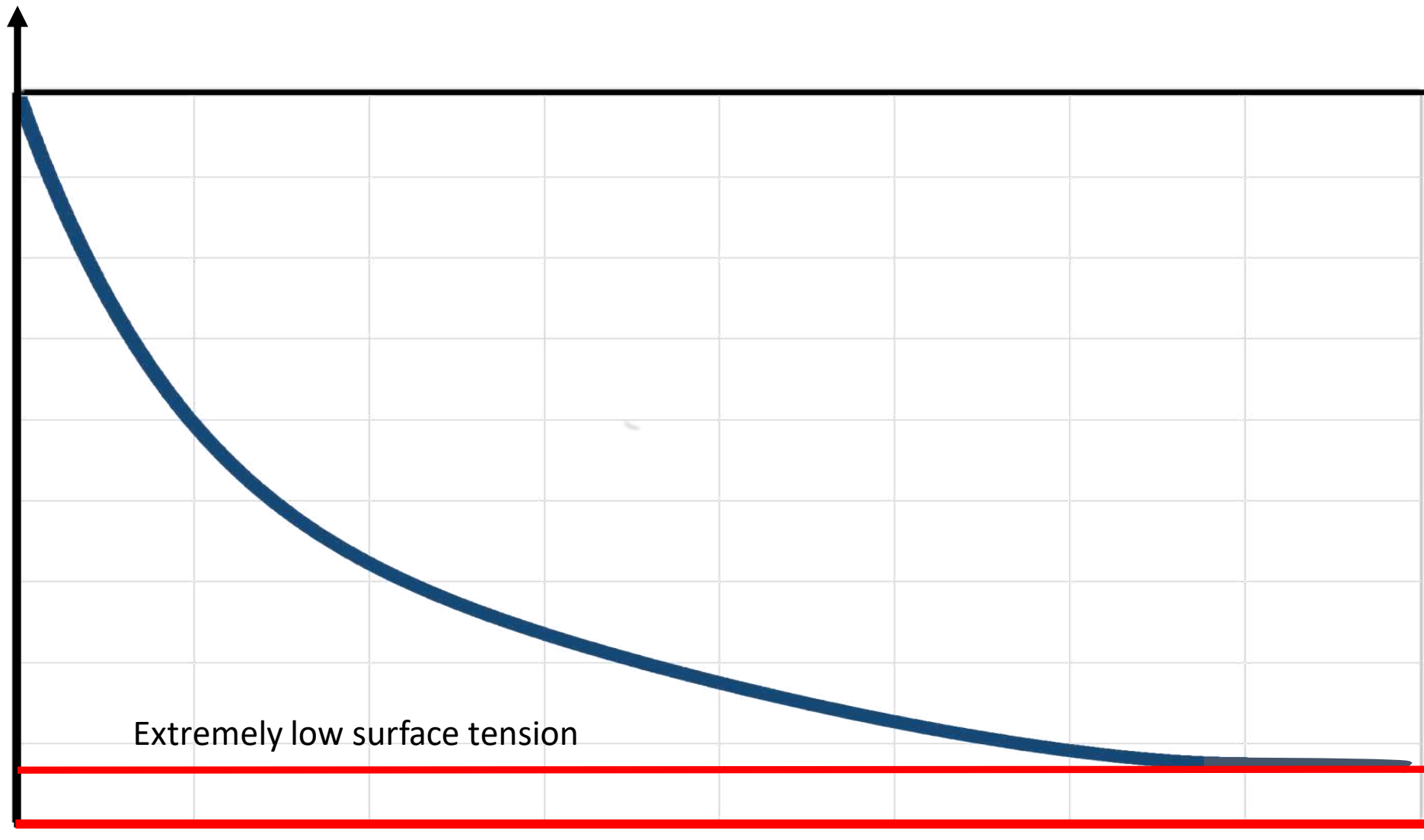
73

35

0

Extremely low surface tension

Wetting agent dosage, %





**The effectiveness of monofunctional wetting agents is approaching its limit, so one of the important directions is the production of multifunctional chemical compounds that will combine 2 or more functions:**

- Wetting agent with dispersant function;**
- Low foam wetting agent;**
- Wetting agent with dispersant effect and reduced foaming**

# Thank you for attention

