

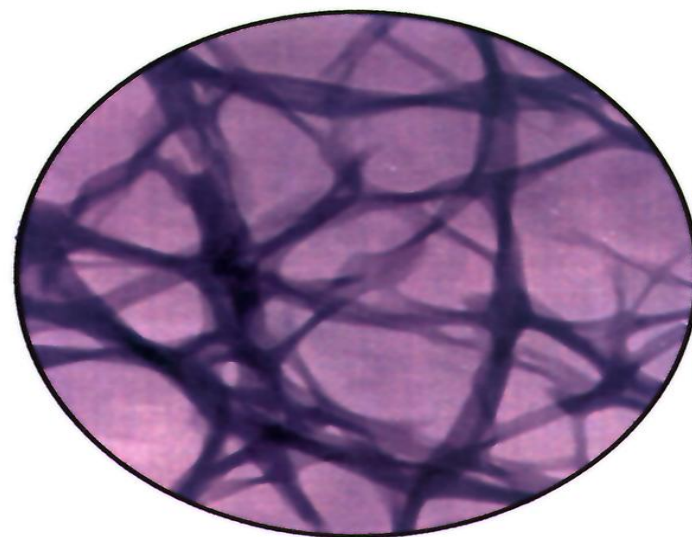
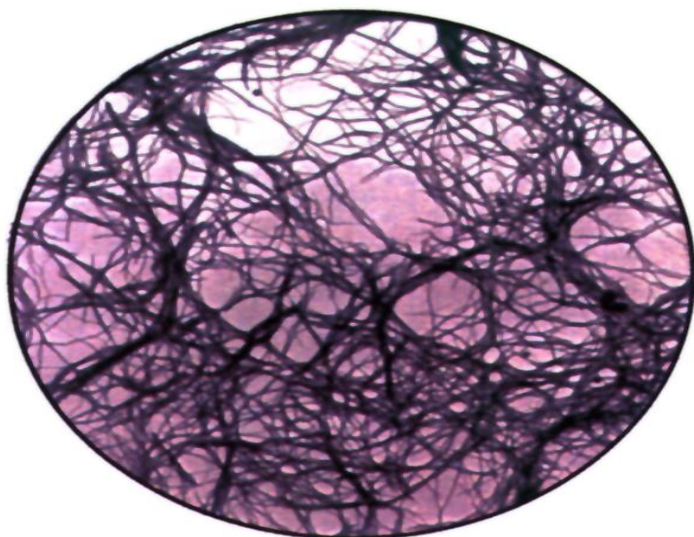


TOTAL

# *Lubricants on the base of calcium complex sulfonate with modified thickener structure*

*Andrey Yasnovsky, Technical Director, TOTAL  
Lubrifiants Russia and CIS*

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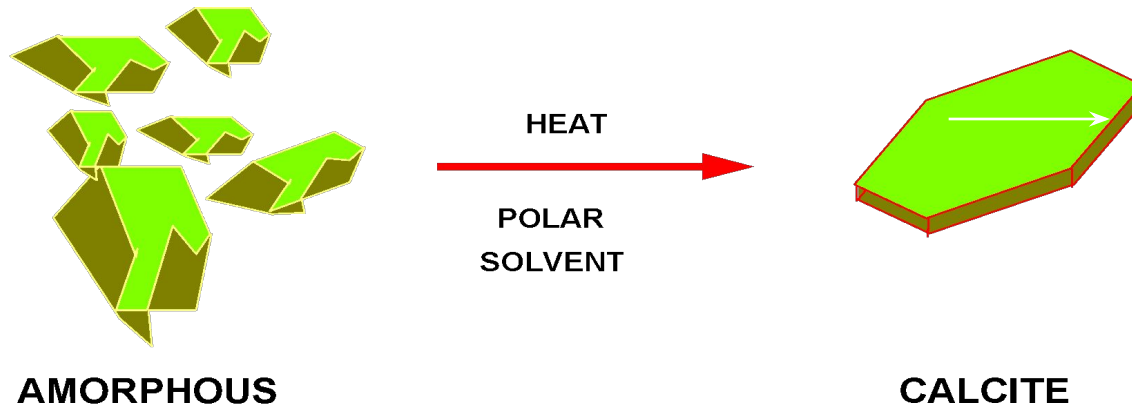


# Requirements of the European market concerning the main types of lubricants



- Resistance to high temperatures
- Super high pressure
- Corrosion protection
- Water resistance
- Self-recovery
- Mechanical stability and resistance to shift
- Good pumpability (providing the pressure in the centralised lubricant feed system is no lower than 60 bar)
- Cost requirements: the average cost of lubricant with a Ca thickener does not exceed 10% - 25% of that of the most widespread Li thickener, even though it has higher operating attributes

# Thickener: basis of the technology

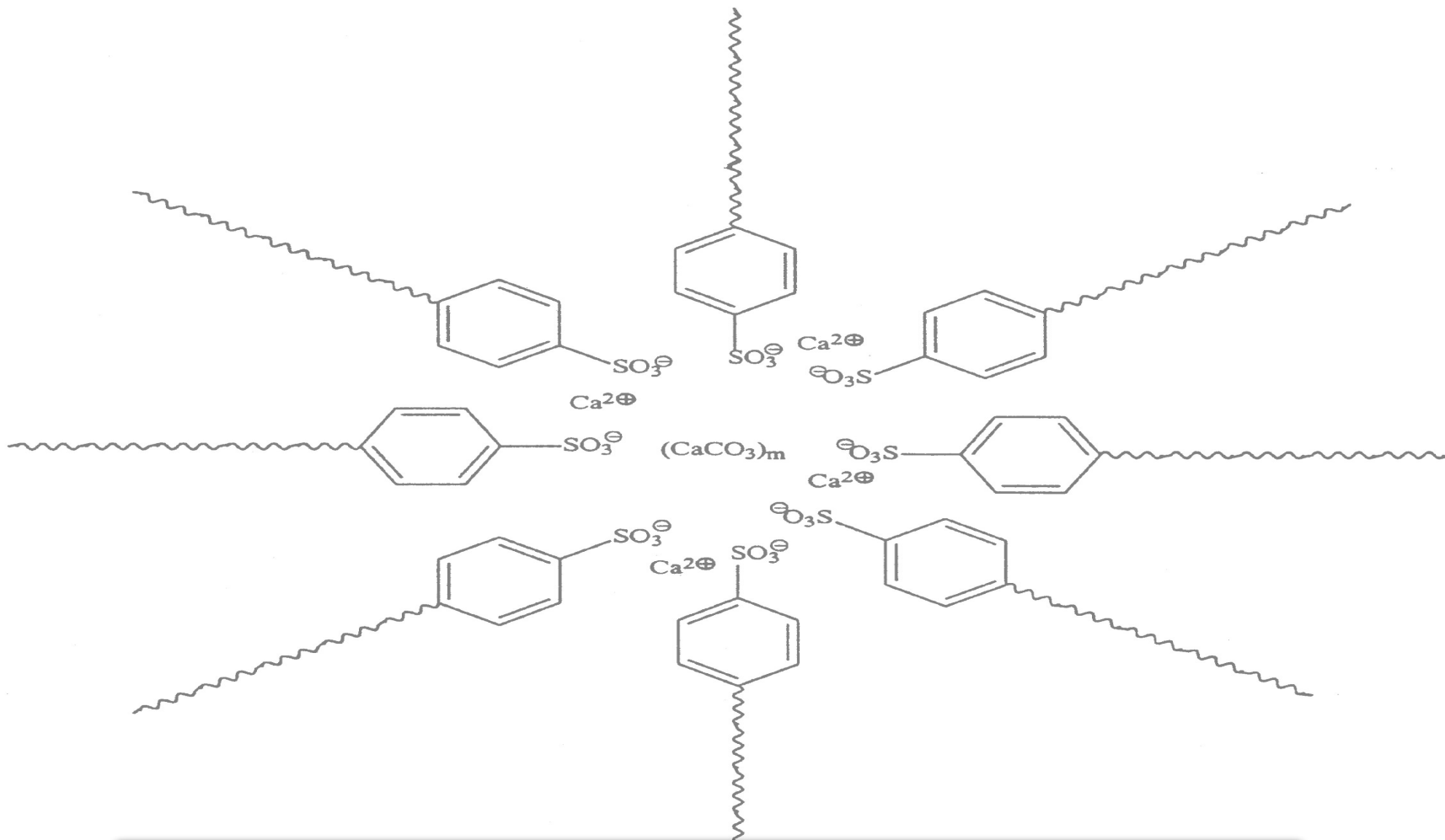


The process of slow homogenisation is very important for the future stable operation of the lubricant (TOTAL Ceran)

# Thickener – base (standard)



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Calcium sulphonate (composite)

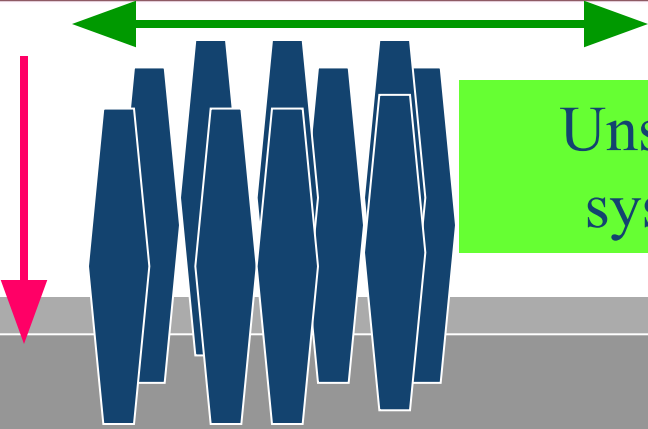
# The secret of the thickener – stable conditions of homogenisation, observance of the technology



**Vaterite**



A poor barrier for water



Unstable system

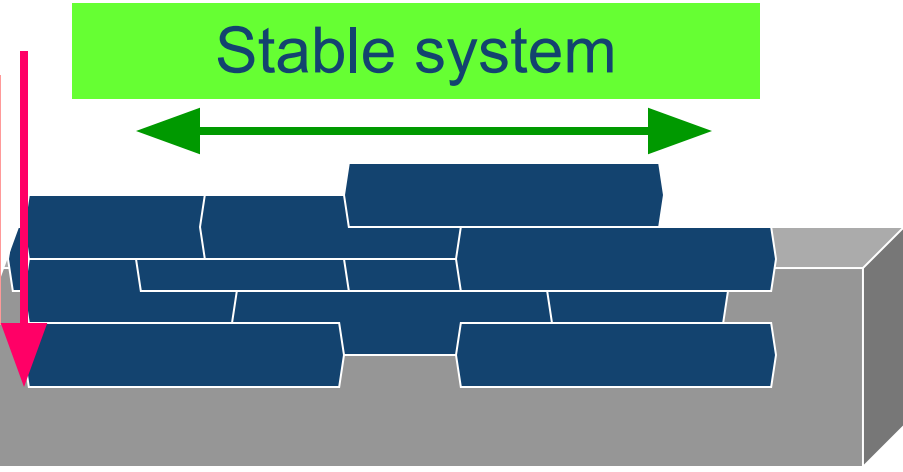
**Possible forms of CaCO<sub>3</sub>**



**Calcite**

A good barrier for water

Stable system





# Advantages of the composite thickener technology

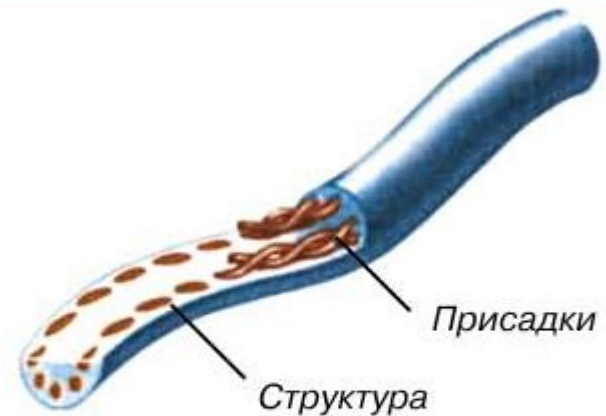


## Волокно загустителя обычной смазки



= Присадки добавляются в структуру

## Волокно загустителя CERAN



= Присадки являются частью структуры загустителя

- Нет риска отказа действия присадки
- Увеличение срока службы
- Снижение расхода смазки

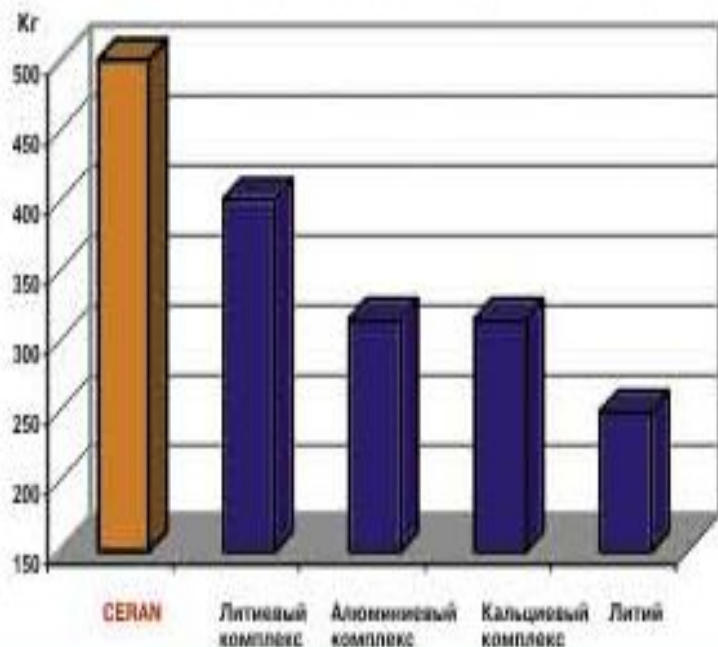
# Qualitative improvement of indications



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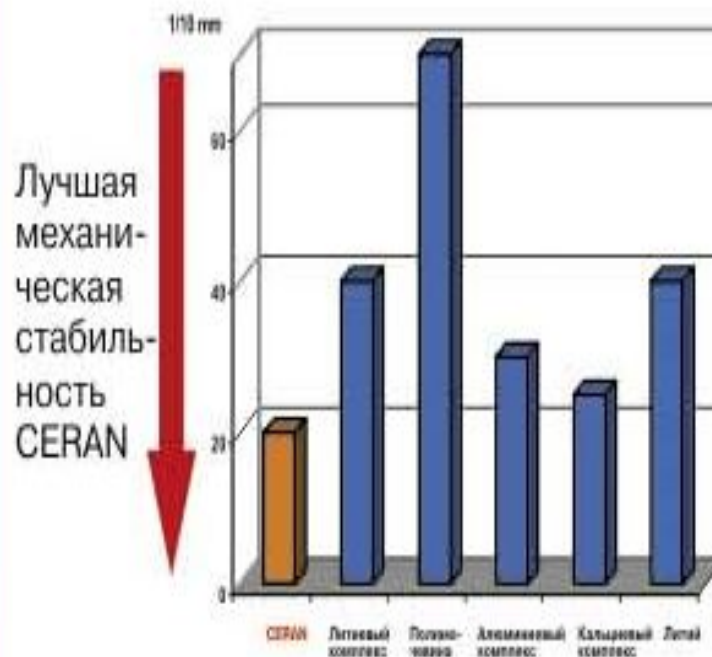
## Высокие нагрузки

Тест на 4-х шариковой машине трения



## Механическая стабильность

Изменение пенетрации после 100 000 циклов



Лучшая механическая стабильность CERAN



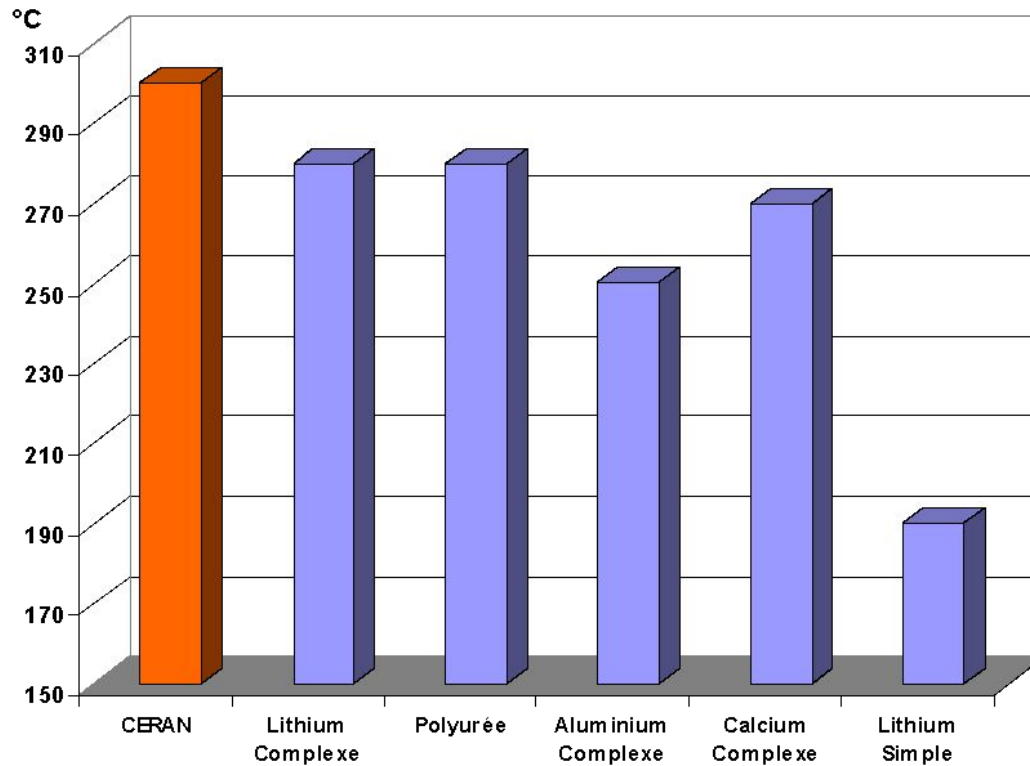
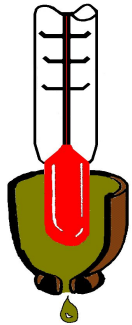




Advantages of the composite calcium thickener with modified additives.

- Anti-wear properties
- Anticorrosion properties
- Thermal stability
- Protective properties
- Extreme pressure
- Mechanical stability
- Service and storage life

# High-temperature attributes



CERAN – Wide temperature range of application

# High operational attributes – broad capabilities for use

- Ferrous and non-ferrous metallurgy
- Woodworking and paper production
- Application in marine units and mechanisms
- Heavy-duty bearings



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**THANK YOU  
FOR ATTENTION!**