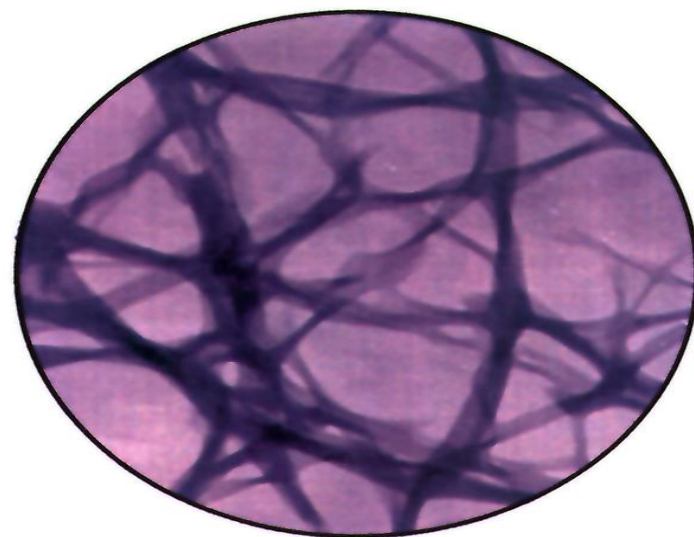
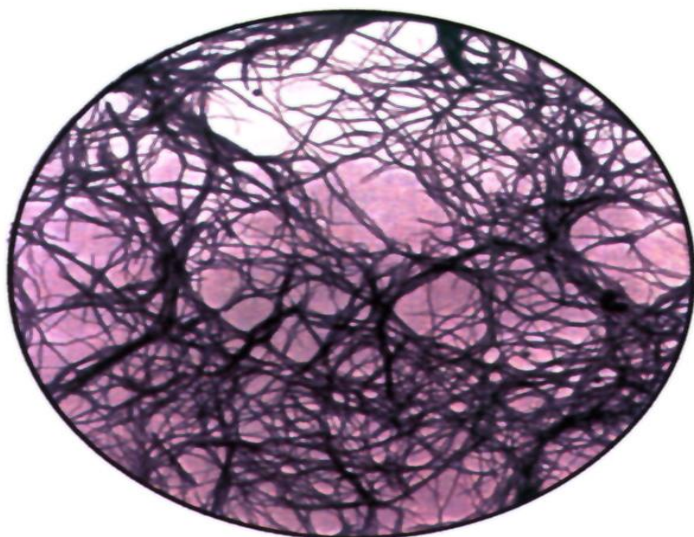


Lubricants on the base of calcium complex sulfonate with modified thickener structure

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



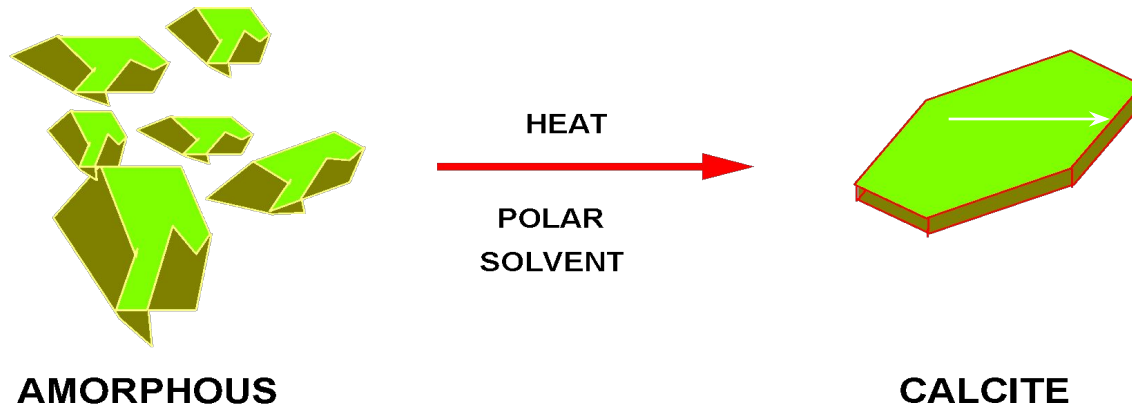
Requirements of the European market concerning the main types of lubricants



TOTAL

- 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

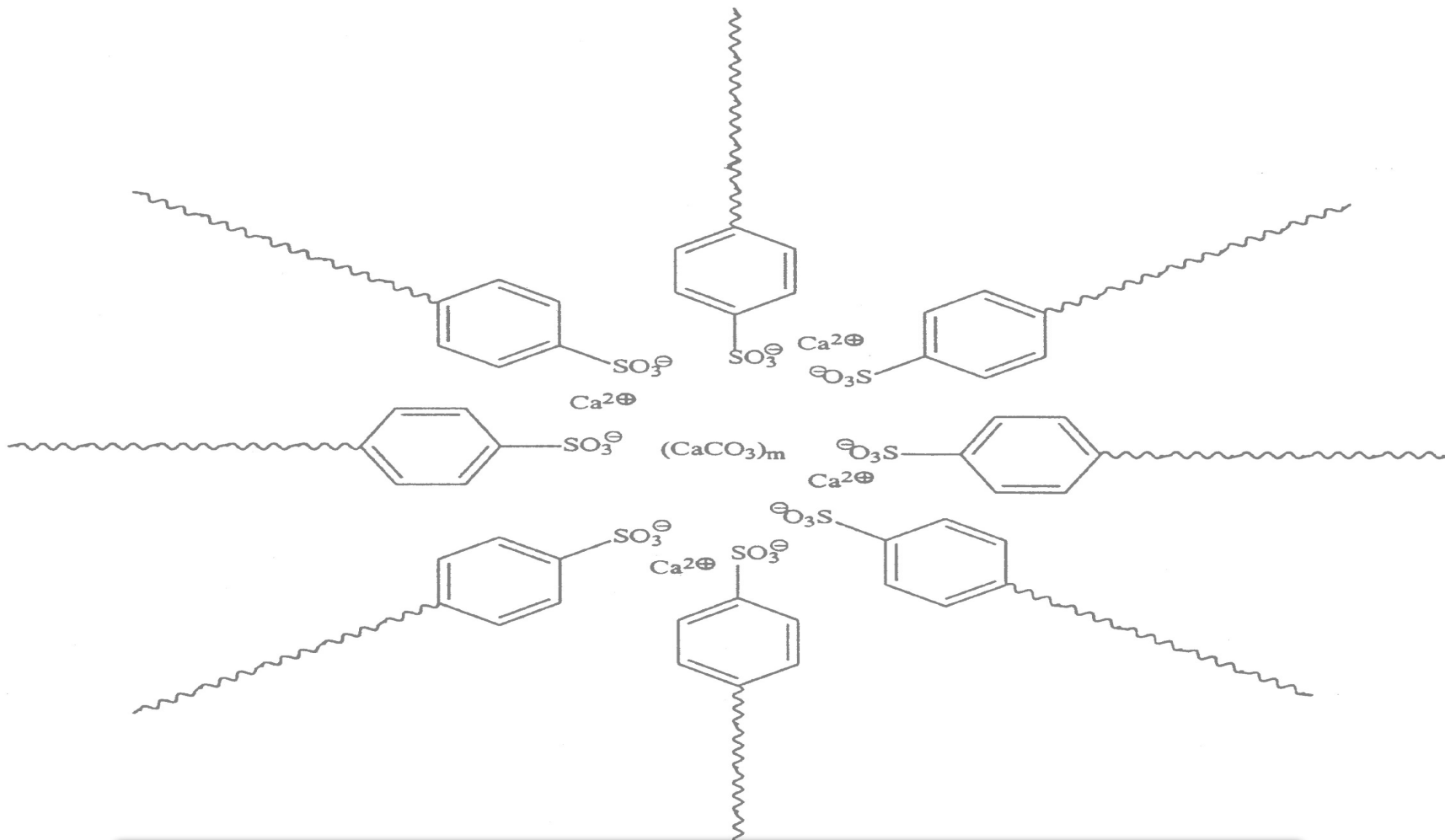


The process of slow homogenisation is very important for the future stable operation of the lubricant (TOTAL Ceran)

Thickener – base (standard)



TOTAL



Calcium sulphonate (composite)

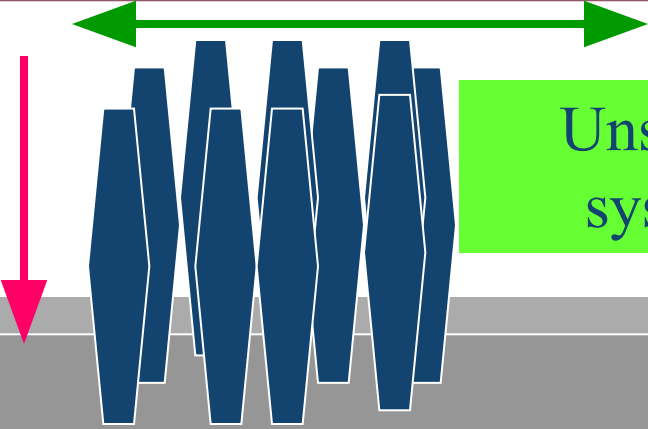
The secret of the thickener – stable conditions of homogenisation, observance of the technology



Vaterite



A poor barrier for water



Unstable system

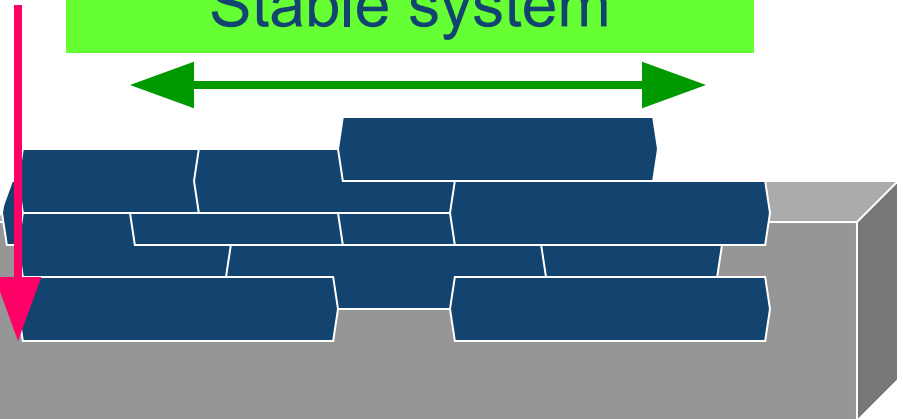
Possible forms of CaCO₃



Calcite

A good barrier for water

Stable system

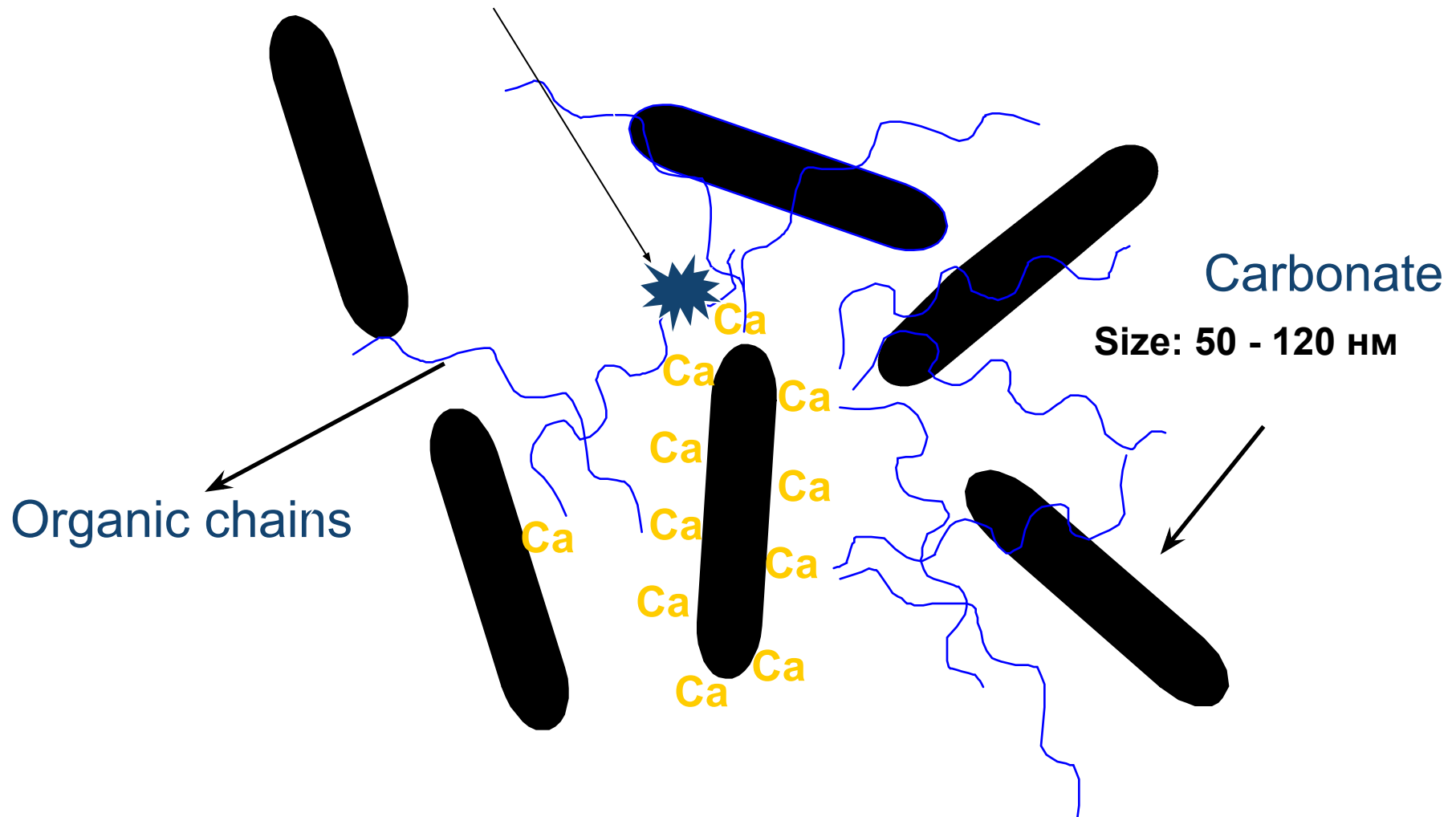


New technologies: the additive is a part of the thickener



TOTAL

Additives and admixtures



Advantages of the composite thickener technology

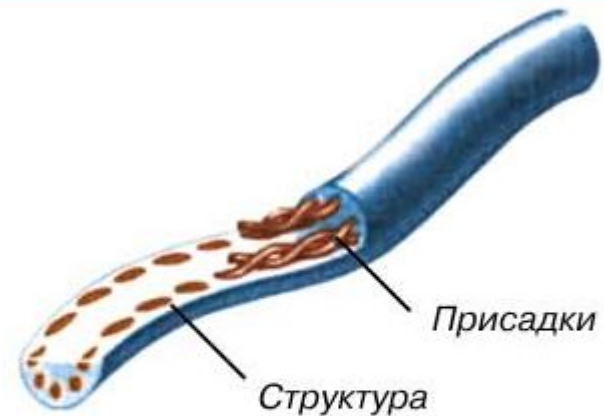


Волокно загустителя обычной смазки



= Присадки добавляются в структуру

Волокно загустителя CERAN



= Присадки являются частью структуры загустителя

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

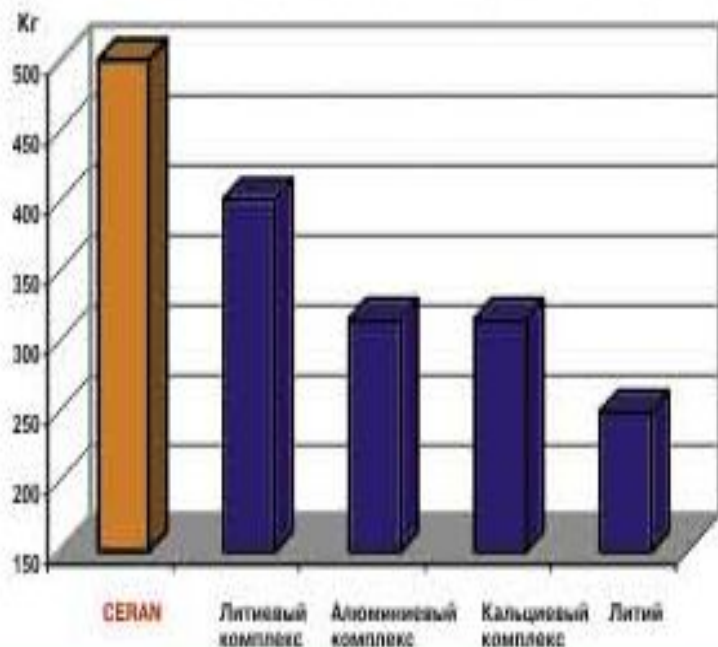
Qualitative improvement of indications



TOTAL

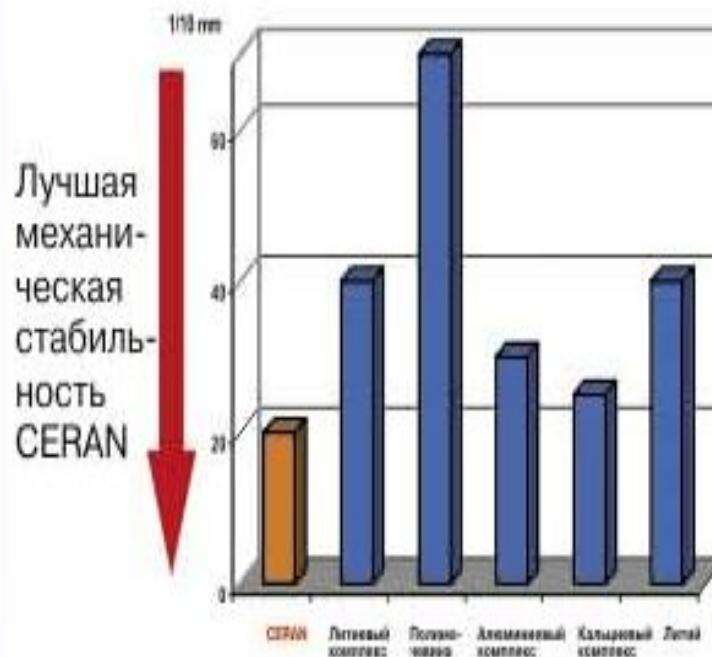
Высокие нагрузки

Тест на 4-х шариковой машине трения



Механическая стабильность

Изменение пенетрации после 100 000 циклов



Лучшая механическая стабильность CERAN

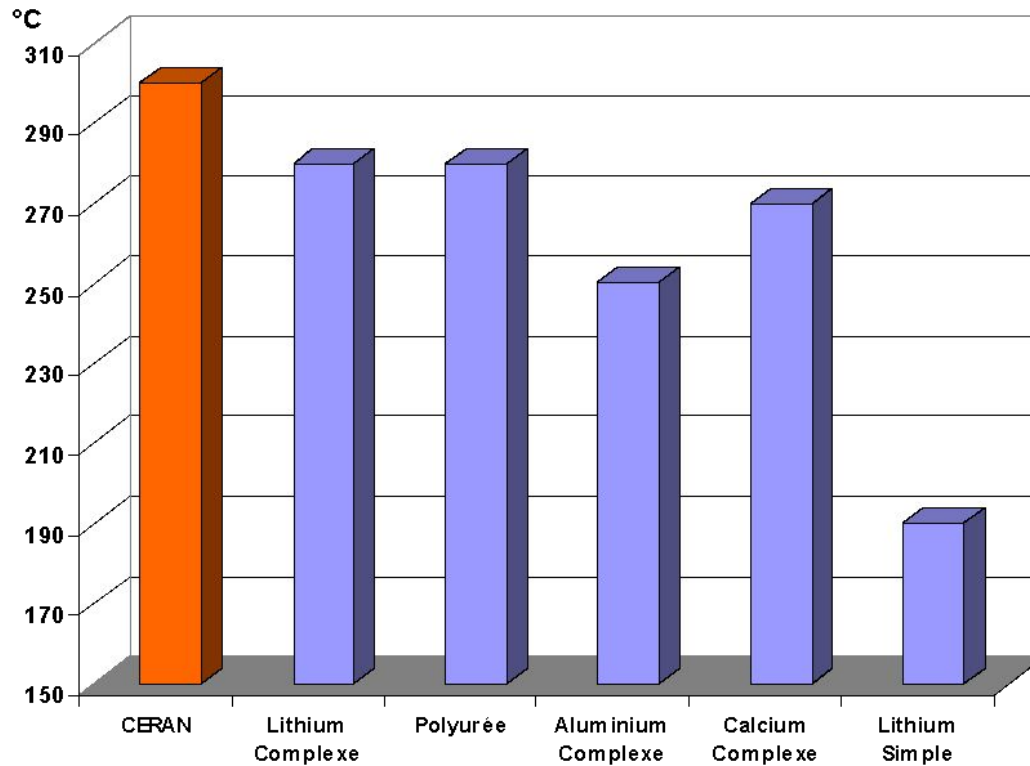
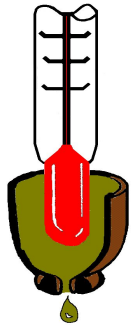




Advantages of the composite calcium thickener with modified additives.

- 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



**THANK YOU
FOR ATTENTION!**