Defoamer -

A comparison of different base oils

BL Interface & Performance

Defoamer are based on different oil types

Basic material:

Polydimethylsiloxane (PDMS or silicone oil)	100 - 1 Mio. mPas OH-functional - oil Alcoxy functional - oil
Organic oils	Vegetable oil Mineral oil White oil Polyethers
Polydimethylsiloxane + Organic ligands	Organomodified siloxane (OMS)

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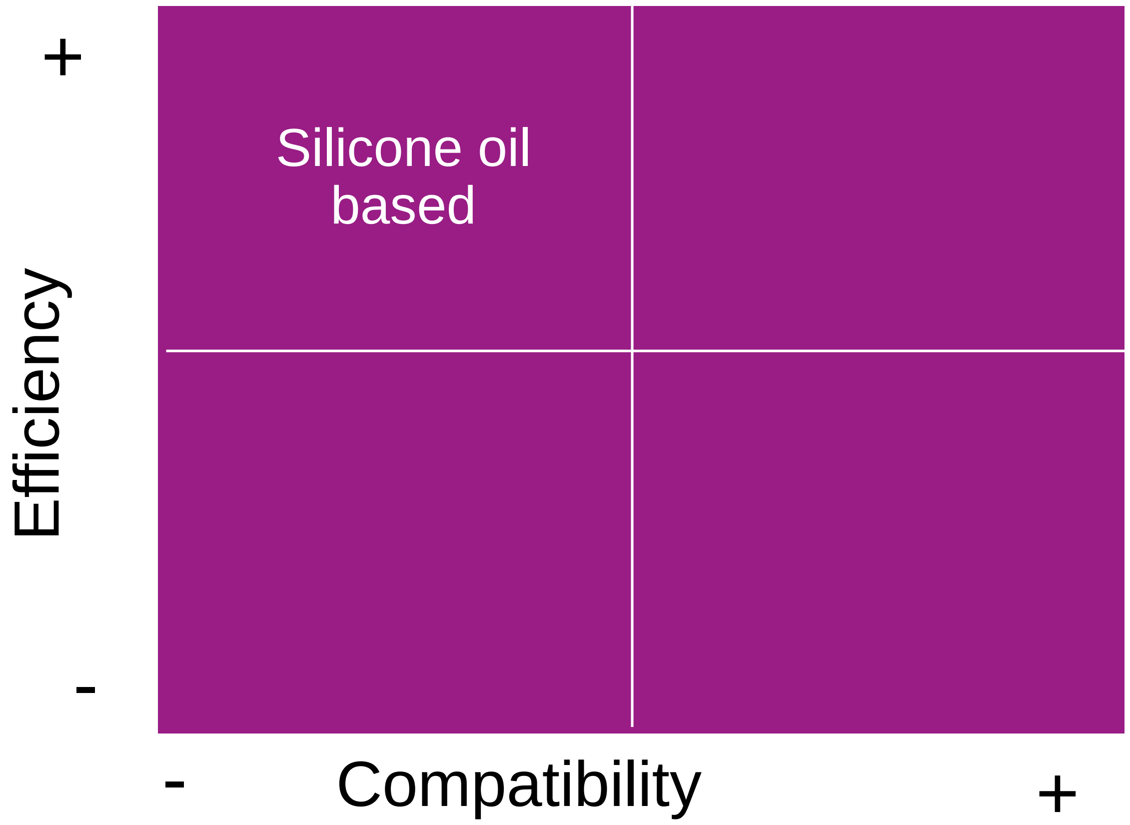
Defoamer based on silicone oil



<u>Efficiency:</u>

Silicon oil has a low surface tension in the range of 20 mN/m

- Excellent antifoaming action

<u>Compatibility</u>:

Negative side effects in most applications

- i.e. wetting defects in film applications

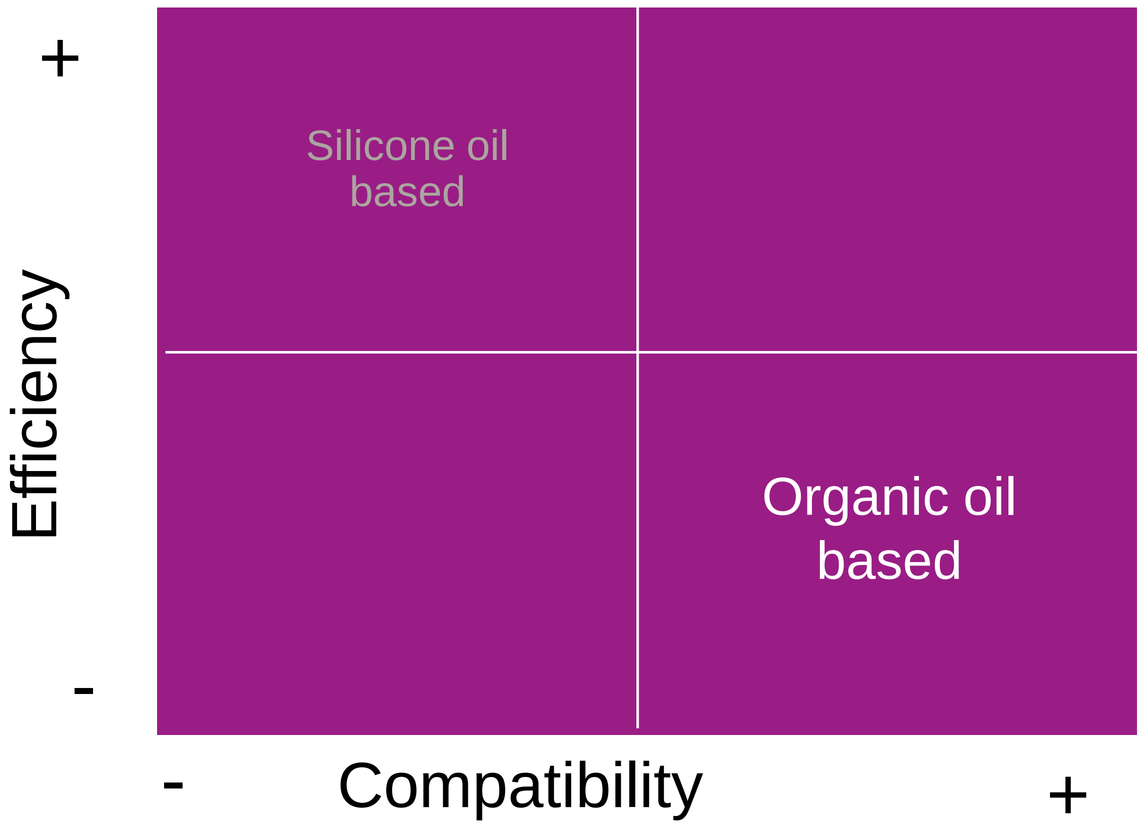
Wetting defects caused by defoamer based on silicone oil

High formation of craters and fish eyes lead to problems in terms of:

- Coatability
- Print- or Paintability
- Delamination / Loss of Adhesion

Therefore silicone oil based products are banned from many demanding applications!

Defoamer based on organic oils



<u>Efficiency:</u>

Organic oils have a surface tension in the range of 30 mN/m

- antifoaming action is much less in comparison to silicone oil based products

<u>Compatibility</u>:

Less or no negative side effects in most applications.

- Less wetting defects in film applications

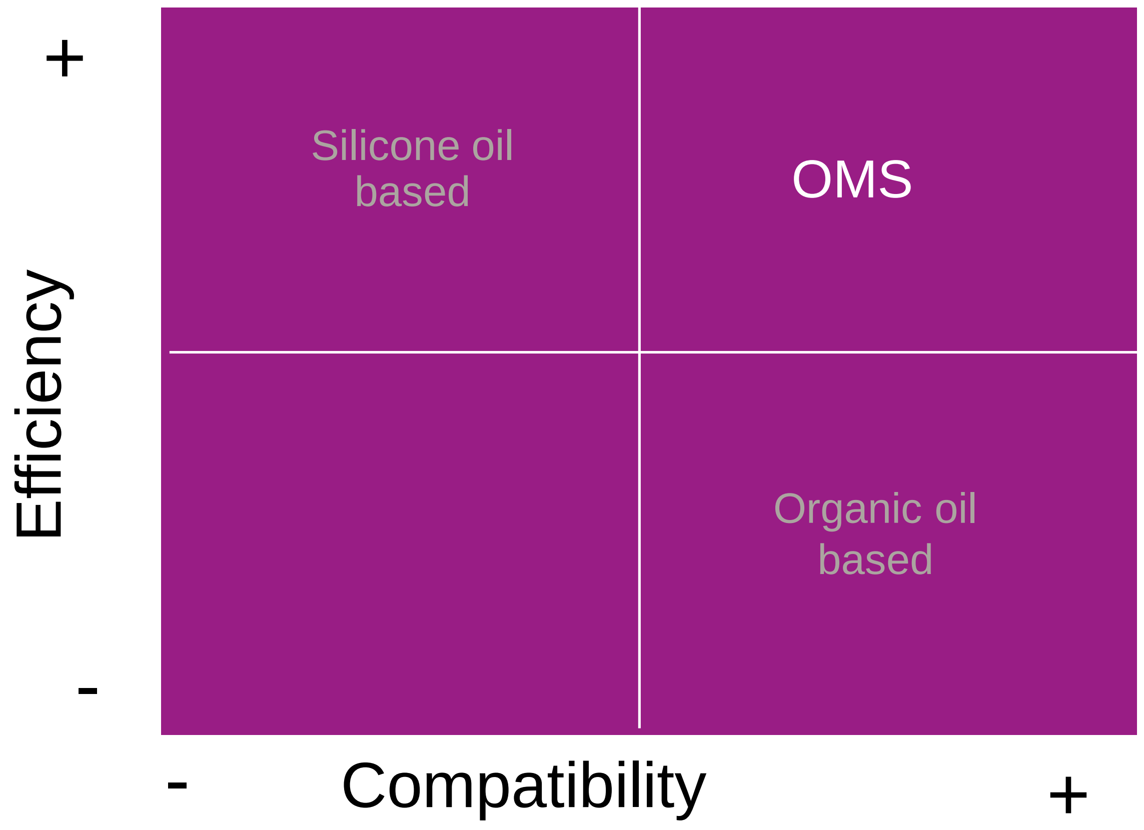
Less wetting defects by using defoamer based on organic oils

Less wetting defects, but organic based defoamer might lead to the following problems:

- Difficult coatability due to stronger foaming
- Mineral oil based products cause fogging
- Generation of VOC

Organic based products might show good compatibility, but for high demanding applications there are certain draw backs.

Defoamer based on organomodified siloxanes (OMS)



Efficiency:

Organomodified siloxanes (OMS) have a low surface tension in the range of 20-25 mN/m

- Excellent antifoaming action

Compatibility:

Because of a high organic share in the molecule the compatibility is excellent

- no wetting defects in film applications

Good compatibility & defoaming by using organomodified siloxanes

Organomodified siloxanes (OMS) combine good compatibility with good defoaming properties:

- No foam built up on machines or during handling
- No defects or fish eyes due to the defoamer

OMS ensure a defect-free application of dispersions and therefore ensure a continuous production for high demanding applications.

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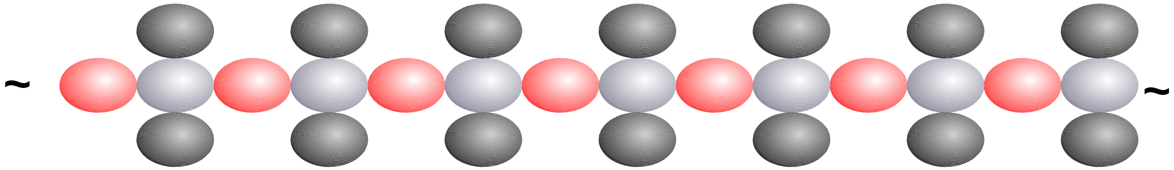
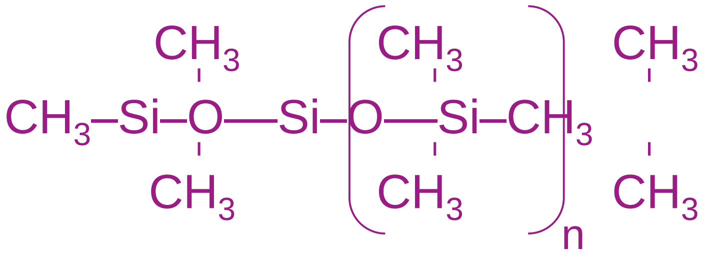
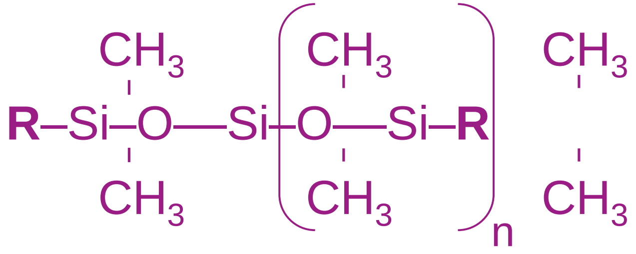
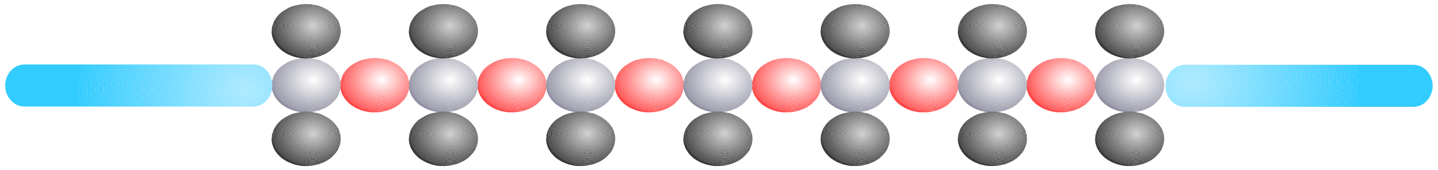
Organomodified siloxanes (OMS) with a linear structure



PDMS

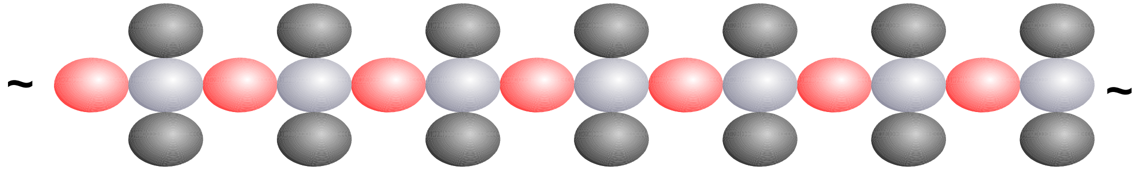


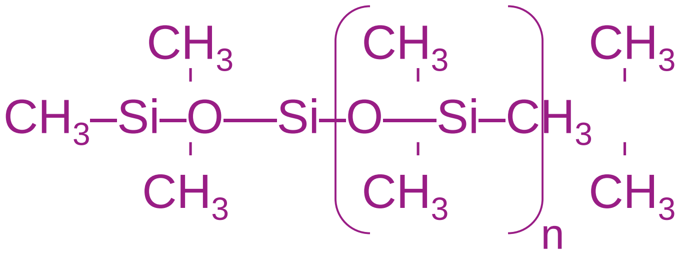




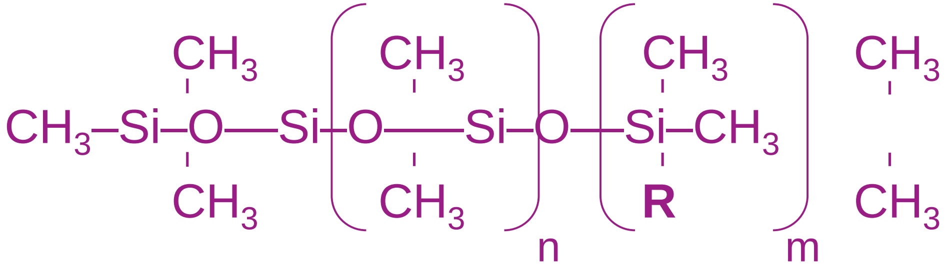
OMS

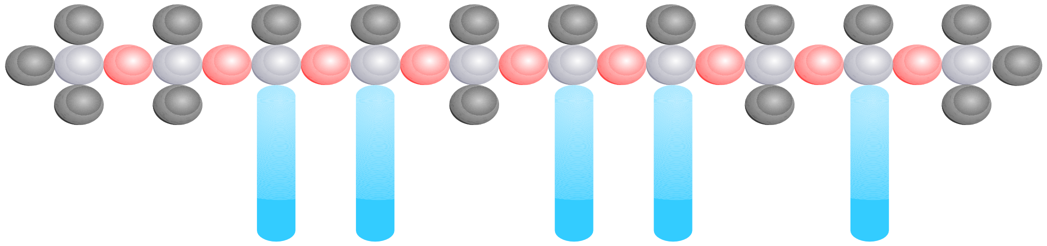
Organomodified siloxanes (OMS) with a comb-like structure





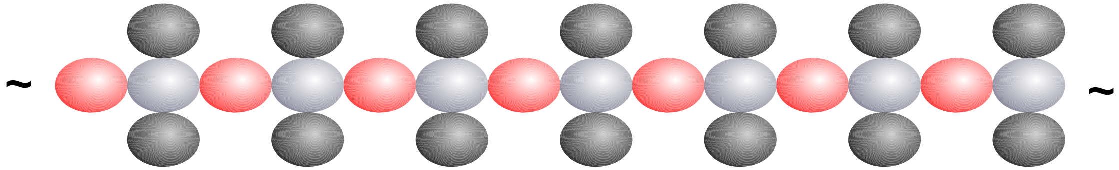
PDMS



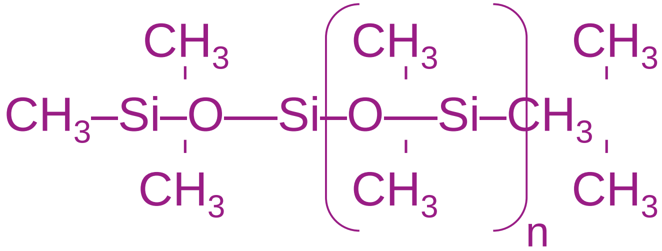


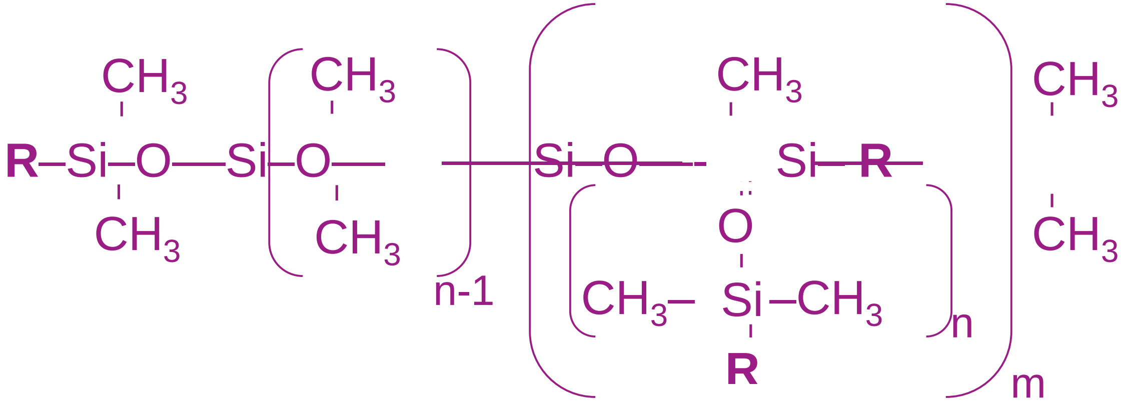
OMS

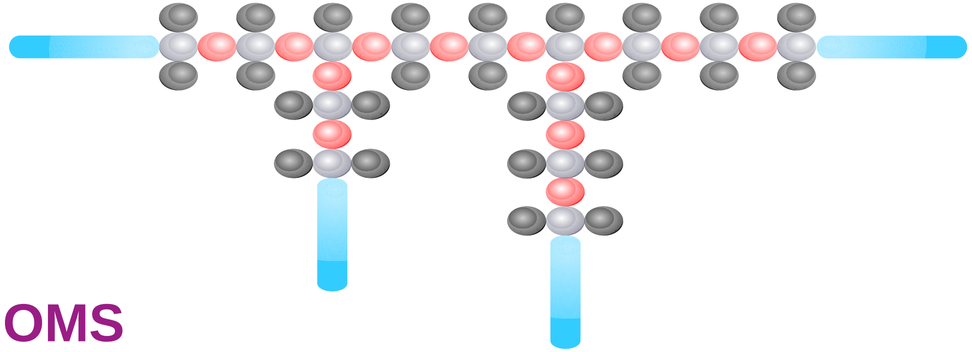
Organomodified siloxanes (OMS) with a branched structure



PDMS



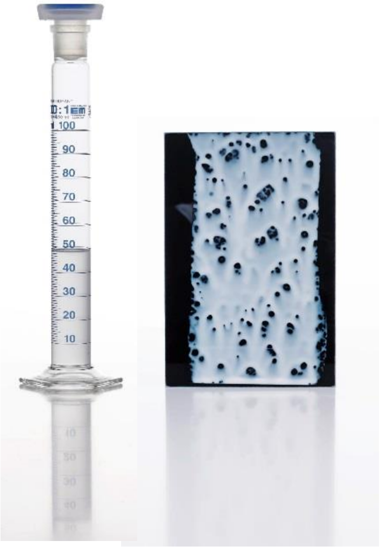




OMS

Summary – different types of defoamer

Organomodified siloxane (OMS) based deformer	Organic oil based deformer	Silicone oil based deformer



Good Defoaming +	Lower Defoaming +	**Good Defoaming +**
Good Compatibility	**Good Compatibility**	Low Compatibility

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