

HYDROCARBON SOLVENT BASED DEGREASERS

Due to the rise of water based degreasers, solvent based degreasers are mainly superseded. However, there are still several applications where solvent based degreasers can be applied, such as the removal of heavy mineral oil / grease contaminations. Since they can be removed from the wastewater via an oil/water separator, solvent based degreasers are often preferred.

Vecom has three types of solvent based degreasers:

Emulsifying degreasers

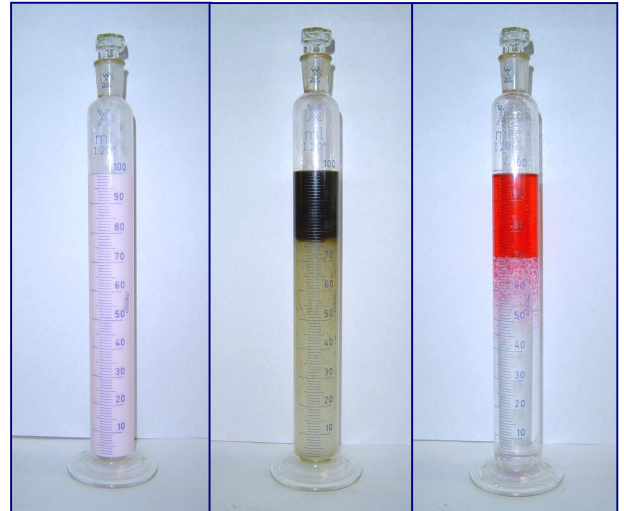
When mixed with water, the oily hydrocarbon solvent distributes over the entire fluid, forming a stable, milky-white liquid (emulsion).

Demulsifying degreasers:

Same, but after settling for several hours, the emulsion will break into a water phase and an oil phase (demulsify). The degreaser plus the solubilized oil / grease will float on top of the water layer which is (almost) free from oil / grease. The oil / grease can be removed from the wastewater via an oil/water separator.

Non-emulsifying degreasers

When mixed with water, no emulsion is formed. They evaporate completely without residues of emulsifiers.



emulsifying

demulsifying

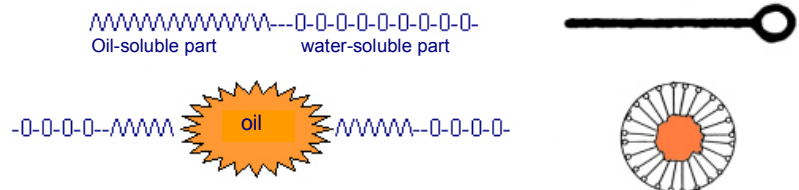
non-emulsifying

What are emulsifiers?

Emulsifiers are agents that act as a bridge between the solvent and water, giving milky-white emulsions. Common names for such agents are:

- Surfactants
- Surface active agent
- Tensio-active agent
- Wash-active agent (especially in case of water based degreasers)
- Soap (especially in case of water based degreasers)
- Detergents

The structure of emulsifiers can be drawn symbolic as follows:



Because the oil-soluble part of the emulsifier penetrates into the oil drop and the water soluble part forms a film around the oil drop, the outside of the oil drop looks like a water drop. This enables the mixture of oil into water, forming an emulsion.

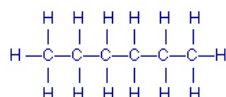
What are hydrocarbons (solvents)?

Methane gas (= earth gas)
Is the smallest hydrocarbon



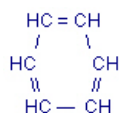
Methane

Aliphatic hydrocarbon
(example)



Hexane

Aromatic hydrocarbon
(example)



Benzene

Summarized, hydrocarbons are solvents based on the elements Carbon (C) and Hydrogen (H).

Aliphatic hydrocarbons have:

- Almost no odour
- Low toxicity
- Good biodegradability
- Moderate cleaning power

Aromatic hydrocarbons have:

- A strong odour
- A higher toxicity / are harmful
- Less biodegradability
- High cleaning power

Definitions with regard to hydrocarbon

Flashpoint

Hydrocarbons are flammable and have a flashpoint. The flashpoint is the temperature at which a saturated vapour can be ignited by a spark. From 61 °C one can speak from a fair safe flashpoint.

Evaporation rate

The evaporation rate is a number that states how many times slower a solvent evaporates compared to ether (the evaporation rate of ether in this case is 1).

Biodegradability

An agent is good biodegradable when it is degraded by standardised bacteria within 5 days at 20 °C in the presence of sufficient oxygen and other foodstuff like nitrogen and phosphorous.

Environmental aspects of hydrocarbons

KWS – 2000

This is a convention in which a large number of countries agreed to reduce the consumption of (volatile) hydrocarbons in order to reduce emission to the stratosphere. Since the solvents that are in use with Vecom are less volatile, this is not applicable for the Vecom degreasers.

OPS

This also known as the painters disease (Organo Psycho Syndrome) which can arise due to the use of highly volatile solvents in closed areas for longer periods. Vecom Degreasers are slowly evaporating (not highly volatile) and are not applied in closed areas for longer periods.

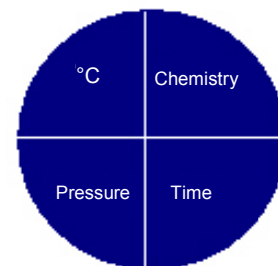
Application of hydrocarbon solvents

Sinner circle

Temperature

Each 10 °C rise in temperature results in a 2 – 3 x shorter cleaning time. For fats there is a general rule that you need to clean at temperatures above the melting point.

An increase of *pressure and / or concentration* reduces the cleaning time as well.



Vecom Product	Aromatic	Aliphatic	Emulsifies	Demulsifies	Flashpoint °C	Evaporation (Ether = 1)	Cleaning	Odour
ACC	+++		+++		> 80		++++	+++
Tankclean Seperating	+++		++	++	> 80		+++	+++
Degreaser MA4 B	++	++	+	+	> 61		+++	++
Veclean HCA		+ -	++		75		+++	+ -
Degreaser GP	+	++	++		> 61		++	++
Totaal Ontvetter	+	+++	++		> 61		++	+
Oil Spill Dispersant		+++	+++		> 70		++	- -
Bio Degreaser 165	+	+++	+ - -	++	65		+	+
Veclean Clear Break		+++	+	++	> 61		+	--
Bio Degreaser 42B	+	++		+++	> 61		+	++
Degreaser 156		+++		+++	61	98 x	+	- - -
Veclean Electro		+++		+++	61	170 x	++	-
Vesol 172		+++		+++	72	600 x	+	- -