



Modern Industrial Cleaners

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Schedule

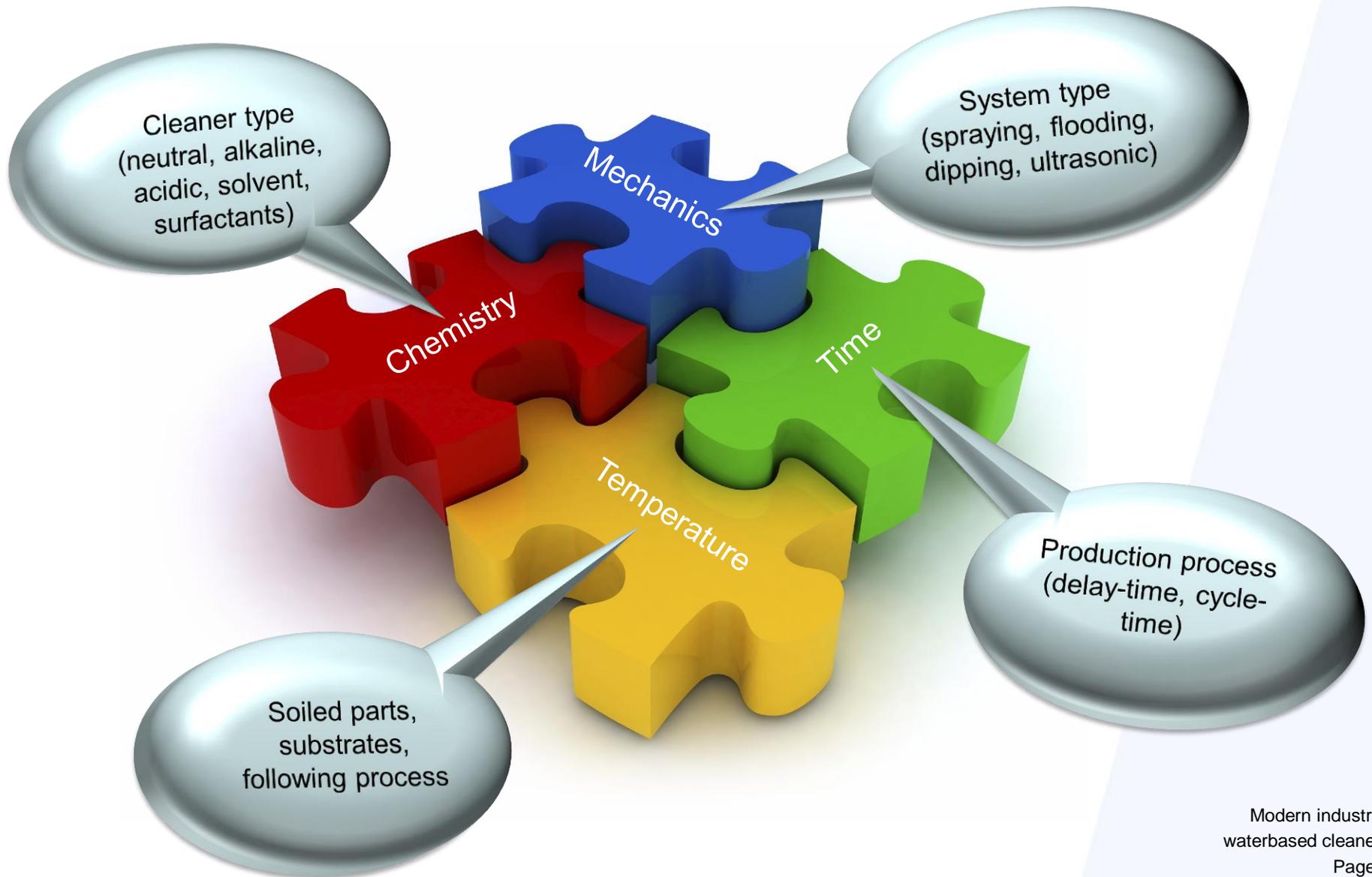
- 💧 Cleaning Parameters
- 💧 Formulation of a Cleaner
- 💧 How does a modern cleaner works
- 💧 Testing's in the Global Application Center
- 💧 Neutral Cleaners
- 💧 Focus to the Industry



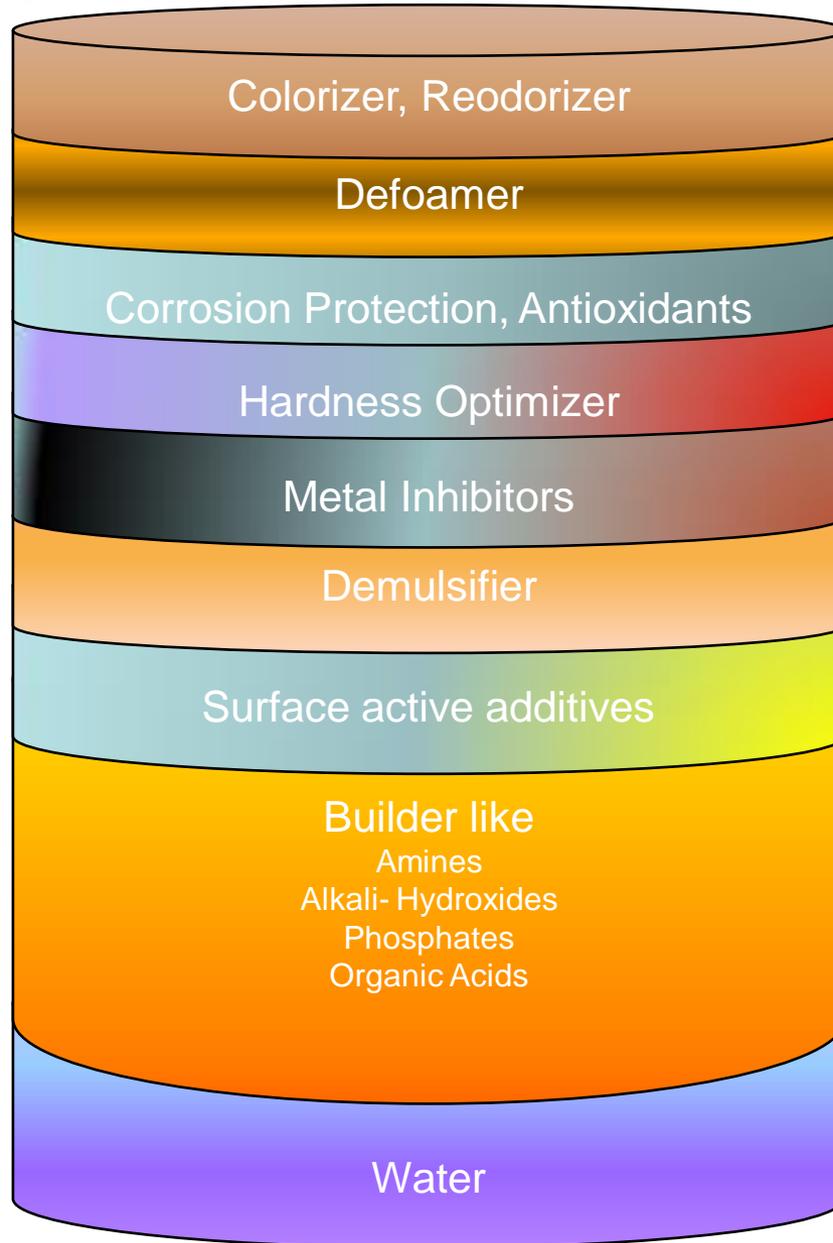
Cleaning Targets

- „Clean“ metal surfaces (to pass the “remaining particles test” for the automotive industry)
 - Removing layers that hinder diffusions (heat treatment)
 - Prepare for welding (absolute clean surfaces)
 - Hygienic surfaces (workspace- and floor cleaning)
 - Corrosion protection
- ➔ These targets are most times only to be reached with more chamber washing machines

Cleaning Parameters



Formulation of a water-based cleaner

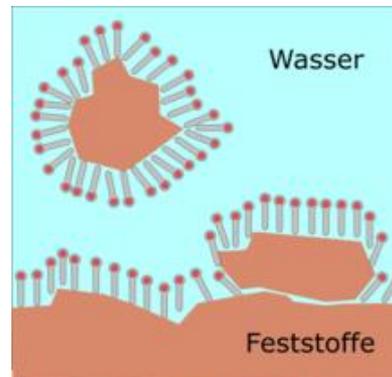


How does a cleaner works I

The main tasks of industrial cleaners are:

1.) To wet the surface of the component

- Wetting the surface of the component → remove dirt and particles
- Furthermore a corrosion protection layer will be build of these amines
- Modern formulations often without surfactants → wetting amines are chosen
- Responsible additives:
 - Amines and organic acids
act together and build a base, the corrosion protection and the buffer
 - Surfactants or wetting amines



Source: <http://www.Googel.de>

How does a cleaner works II

2.) Dirt transport (dirt carrying ability)

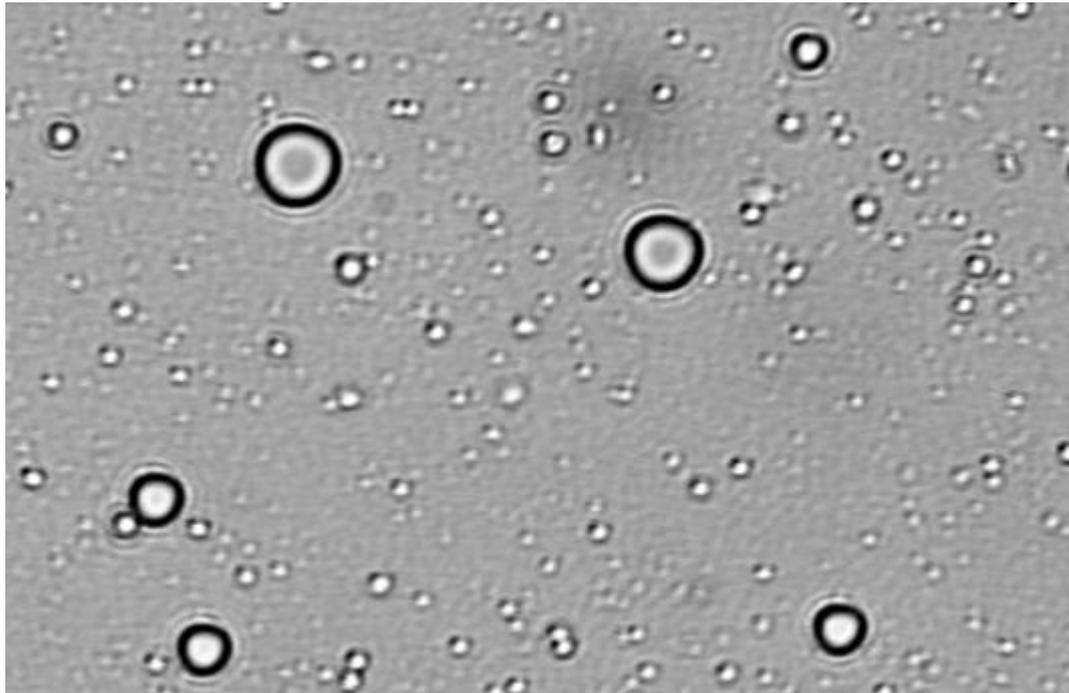
- Amines and/or surfactants transport organics and dirt
- Filter und skimmer remove the dirt → result is preventing re-contaminating
- Metallic dirt particles are added into oil drops: strong wetting amines
 - This way small metallic particles are transported and skimmed
- Responsible additives:
 - Amines
 - Surfactants



How does a cleaner works II

- Using FPIA (**F**low **P**article **I**mage **A**nalysis) it is possible observe cleaning fluids three-dimensional in a high precision
- Able to control and optimize the integration of metallic particles into oil drops

Result: Clean components and proper cleaning baths



How does a cleaner works III

3.) Clean the cleaner (demulsification)

- Long lifetime + technical cleanliness: dirt and oil/ester need to be removed from the washing-fluids
 - Mechanical by filtration
 - Chemically with demulsifiers
- Chemical modified, long-chain amines are used in modern systems
- In areas of slow fluid movement these demulsifiers act highly agglomerating
- Cationic surfactants are also in use

Responsible additives:

- Demulsifying agents
- Defoamers
- Stabilizers



Internal high pressure tests up to 2500 bar



The cleaners are tested at 70 ° C for 8 hours, circulating and spraying:

- FEROCLEAN A 185
- FEROCLEAN 22 DGI
- FEROCLEAN N 600



Internal high pressure tests up to 2500 bar



Result:

- No foam
- Very good pressure stability
- Best possible cleaning result

Neutral Cleaners

- Neutral cleaners are liquid products
- They are not really neutral. The pH value of a solution for application is 7.5 to 10.5 (per definition)
- Neutral cleaners are usually used in spraying, dipping and flooding systems at temperatures of 15 to 80 ° C without rinsing
- Most are salt free
- Typically they are usable for ultrafiltration
- Non-hazardous material



State of the art neutral cleaners

Product	pH-value 2 %	use Temp. [° C]	Corr. Prot.	Material	Concentration [%]	Application
FEROCLEAN N 404 → modern, surfactant containing cleaner, newest generation	9.2	40 - 70	+++	steel, stainless steel, cast iron, aluminum, yellow metals	1 - 5	Washing of aluminum without decolorizing, especially to be used in washing machines with vaporizers, to remove coolants, labeling free, bactericide free, long time stable, without formaldehyde releasers, boron free
FEROCLEAN N 600 → modern, surfactant free cleaner, newest generation	9,6	5 - 90	+++	steel, stainless steel, cast iron, aluminum, yellow metals	0,5 - 3	High corrosion protection is given already from low concentrations on, very good demulsifying properties, almost foam free, bactericide free, long time stable, without formaldehyde releasers, boron free; specially developed high pressure cleaner up to 2500 bar!

+ temporary corrosion protection
 ++(+) higher temporary corrosion protection

All cleaners are hard-water resistant.
 The use of deionized water is recommended.

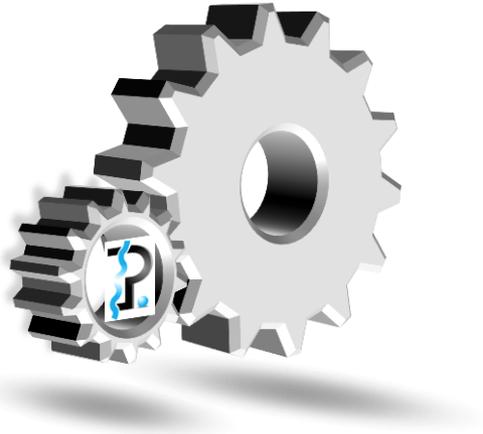
Neutral cleaners

Product	pH-value 2 %	use Temp. [° C]	Corr. Prot.	Material	Concentration [%]	Application
FEROCLEAN N-SF	9.0	60 - 70	++	steel, cast iron	1 - 3	Base cleaner for heat treatment prior to gas nitriding, very efficient cleaning and demulsifying properties, used for a residue-free step cleaning process by spray-washing and immersion
FEROCLEAN A 285	10.2	50 - 75	+++	steel, cast iron, partly aluminum	1 - 5	Heat treatment and mechanical production, especially in central systems, high efficient washing and demulsifying properties, biologically stable, leaving low residues, low foam

+ temporary corrosion protection
 ++(+) higher temporary corrosion protection

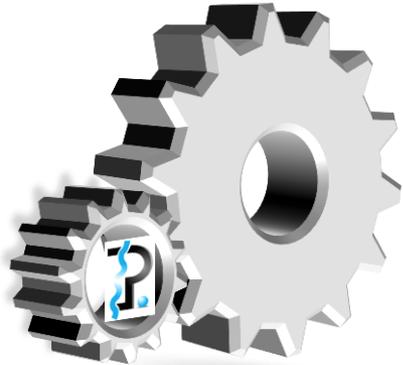
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FEROCLEAN N 600: Low temperature washing at OEM's



- For many employees odor caused by bacteria and fungi is a problem
- Modern products are formulated longtime-stabile
- State-of-the-art formulating using long-time stable amines and completely resign bactericides
- Thus, cleaners are more skin-friendly than conventional products
- No classification according to directive 1999/45/EC

FEROCLEAN A 285: Intermediate- and Final washing



- Foamless
- High demulsifying
- Usable from 50 to 75 ° C, unique, temperature stable surfactants
- Good corrosion protection
- Dipping, spraying and flooding
- Especially developed for heat treatment, leaves no diffusion hindrance layer
- Free of boric acid
- REACH registered
- Matches GHS
- For single and central systems







Thank You for Your attention

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