Aspects of Degreasing
Process-specific requirements

A significant building block for the successful employment of a degreasing product is the process-specific consideration of the system periphery.

Stage 1 Production technology
At the beginning, all necessary information on the production type and variety is collated. This forms the basis for the following analyses.

Stage 2 Cleaning technology
The cleaning-specific parameters, such as cleaning type & time, flushing conditions, type of the concentration measurement and temperature are recorded.

Stage 3 Waste-water technology
The process parameters recorded in the second stage are determined and evaluated with regard to regenerative measures and waste-water conditions.

Stage 4 Target definition
Specification of the requirements in case of cleaning quality and waste-water characteristics. The degreasing methodology is developed adapted to this.
Tensides

These are substances which can take over very different functions, with reference to soiling. They provide for a stronger wetting, where they reduce the surface tension, decrease the adherence and support the detachment of the dirt from the surface to be cleaned. There exist different tenside classes:

**Anionic tensides**
These offer a good emulsifying capability, however, this is not controlled. Due to the foaming activity, anionic tensides find application mainly in boiling-degreasing, immersion-degreasing and ultrasonic-cleaning.

**Non-ionic tensides**
These can be adapted very well to conditions in practice. The physical characteristics are controlled over the cloud point: The degreasing effect is maximized near the cloud point, the anti-foaming effect is maximized above the cloud point and the wash-off capability is maximized below the cloud point.

**Cationic tensides**
These indicate a very marked absorption characteristics on the surface to be cleaned.

**Amphoteric tensides**
These are also designated as zwitterionic tensides and are frequently used for solubilization (increasing the solubility of a material in a solvent through the addition of a third material).

Builders

In combination with tensides, these increase the cleaning effect by a multiple. The contamination is dispersed (held in suspension in the cleaning solution) in order to avoid the resoiling of the cleaned surface.

Alkalis

Alkalis, for example sodium or potassium hydroxide, react with unsaturated compounds (unsaturated fatty acids) from the dirt to form soap, which can have an effect which is positive with respect to washing activity or which is negative with respect to foam formation. They serve as conductivity providers for electrolytic degreasing processes.

Softeners

These complexate the water hardness and thus improve the cleaning products. Threshold inhibitors represent an alternative which, unlike the complexing agents, disperse the water hardness and thus positively affect the waste water technical characteristics.

Corrosion inhibitors

The addition of corrosion inhibitors influences the degree of material removal and the material attack during the cleaning process.
In considering degreasing processes, changes in soiling occur with the passage of time through enrichment, foaming or leakage. The bath concentration changes, for example through entrainment losses, chemical changes and cleaning discharge over process-regenerative elements.

The degreasing process is a dynamically-changeable process.

**Preparation of degreasing baths**

*The membrane filtration is a suitable method to regeneratively process degreasing baths and to further optimize the cleaning process.*

A favorable factor for the membrane filtration process is the schematic represented to the right. A further dynamizing of the process conditions results, where the contamination entered into the degreasing process (e.g. oil, greases, pigments) can be different manufacture-related. The contamination elements do not correspond to a defined substance in the type of chemical composition, rather they are structured diversely. In part, the contamination elements include additives / emulsifying agents, which can have great similarity with the tensides of the cleaning agent.

**Change of concentration through membrane technology**

The tensides can be held-back by the filtration membrane and the proportional composition of the cleaning agent changes as a result.
Process-accompanying measures

In order to make statements about the performance of a filtration system and the characteristics of a soiled degreasing bath, a practice-oriented procedure is recommended.

The potential of a membrane filtration system and the filtration characteristics, in combination with the degreasing agent used, is an extremely complex subject. In order to be able to give the customer the best recommendation, the following procedural method is employed:

### Stage 1
Verification and coordination of the degreasing agent to be possibly used, with reference to the membrane compatibility

### Stage 2
Test of the elimination characteristics of the tensides on different membrane materials / geometry and pore widths

### Stage 3
Extraction of representative bath samples from the degreasing process, for the determination of the elimination capability of the bath soiling

### Stage 4
Test system filtration experiment on site, subject to observation of already existing regenerative process elements and conditions

### Stage 5
Cost-benefit analysis and assessment of the filtration experiments. Generation of a report with recommendations for the project

Service and service-provision offers for degreasing baths

After application of a degreasing agent or a membrane filtration system in a process sequence, it is important, particularly in the initial phase, to offer process-accompanying support to the customer.

ROBOTCHEMIE accompanies projects, not only the during conception and application phases, but over and above this in accordance with the desires and requirements of the customer.

A small selection of the process-accompanying possibilities are:

**Solid matter / Surface investigation**
- Paint compatibility
- Electron spectroscopy/raster electron-microscopy
- Test of the corrosion-protection capability

**Waste water / Environmental analysis**
- Waste-water investigations
- Determination of the chemical oxygen consumption
- Toxin analysis

- Metal analysis

**Process-oriented bath analysis**
- Alkalinity / Conductivity determination
- Surface tension measurement
- Fingerprint analysis
- Determination of the bath loading

**Sampling support**
- Automatic sample devices, including operational startup for representative samples
- Collection service for bath samples - also express service in case of urgent analyses
- Comprehensive analysis reports with result-oriented recommendations

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Do you have any questions and do you require a product consultation?

Our sales team and our chemistry-technical consultation service are glad to remain available to you.

Contact us by telephone: +49 (0)209/95899-0 or by e-mail: info@robotchemie.de