

# Database for Metal Cleaning



The European Union supports a large scale innovative Project in order to improve all aspects of metal cleaning practices in small and medium enterprises. The project does *not* focus on convincing practitioners to apply new methods, rather the other way round: to identify reliable practical solutions, document them and make them accessible.

The project consortium consists of a German institute of applied research, a Spanish university department, a Greek public power supplier, an Estonian environmental agency and an Icelandic technological institute.



## Information for the user

There are two possibilities to access the data: Firstly, users find basic information on different cleaning methods and can view all related processes stored in the database. Secondly, users enter all individual requirements via a comprehensive search interface. This may include parameters for material, dirt, size, geometry, amount and subsequent process. The search results will appear in a list along side a rough basic evaluation. From this list the interesting processes can be selected and the respective technical sheet with almost all stored data can be retrieved.

These information are shown in extra screens and include e.g. removed dirt, all process steps and the agents used in these steps, the type of equipment and the cleaning procedure in detail.

## Evaluation

Search results can be evaluated by the system according to the individual requirements be they **technological, quality, environmental, health and safety or cost** considerations.

Thereby all criteria will be further subdivided, in order to avoid coming up with a summarized score, which will have little meaning to the practitioner. The users are to decide how to weigh the different categories according to their individual requirements. This tool gives out evaluations on a scale of one to five and has the following structure:

### Technology

In this area users can see how the company technician evaluates the equipment. Here we do not publish advertisement of plant producers nor views of theorists, but the unemotional statement of a practitioner. In addition important selection criteria are given like: maximum equipment utilization, size of equipment, cleaning steps, auxiliary equipment and necessary qualification level of operator.

### Quality

Under quality – defined as customer satisfaction – users are presented with the following criteria: quality of the process as seen by the plant technician, description of the subsequent process as a scale for the required cleanliness, description of the applied internal and/or external standards and a description of the analytical methods applied.

### Occupational Health and Safety

Health and safety criteria are broken down into the areas agent, equipment and the combination of agent and equipment with their special hazards.

#### a) Cleaning agent

The users get all ingredients plus their percentages listed as far as they could have been ascertained, together with the related danger symbols,

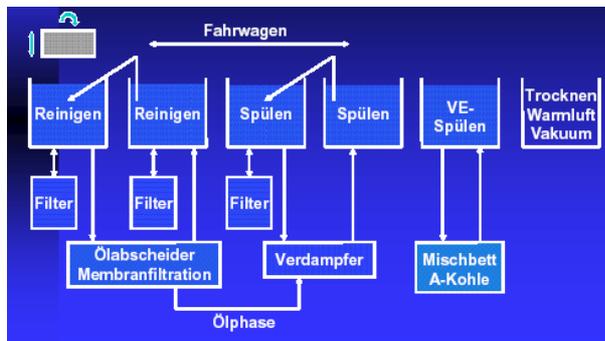
R- and S- phrases and the occupational exposure limits.

In addition an evaluation based on the column model<sup>1</sup> will be displayed. According to the R-phrases and other criteria specified by the model an evaluation for the following sub criteria is given: acute health hazards, chronic health hazards and fire and explosion hazards.

The working concentration in the plant thereby serves as basis for the establishment of the R-phrases and other criteria. This is important regarding aqueous cleaners, where concentrations of the delivered product may vary considerably. This would distort a comparison of different agents and their properties during the cleaning process.

### b) Equipment

Here users are informed as to whether the equipment meets the related standards and the CE directive and thus a risk assessment and a subsequent optimisation has been applied.



### c) Combination agent/equipment

Also in this area the column model has been applied. However the criteria under the heading "Hazards caused by procedures" have been largely supplemented. A matrix was developed, which considers all major aspects like degree of plant confinement, size and type of exhaust, volatility and temperature of agents plus the hazards caused by the agents.

### Environment

Environmental hazards caused by the agent are also evaluated by using the column model, considering the R-phrases, the danger symbol N and the German water pollution classes. Hazards caused by the exposure potential follows also the column model. Here state of aggregation and vapour pressure are used for the evaluation. Finally the methods of disposal are stated, but only for the cleaner. The dirt is not considered in order not to devalue a good process for a bad dirt, as this cannot be blamed on the process. As in the area of

occupational health and safety all evaluations are based on the working concentration as used in the plant..

More equipment related are then the statements of energy- and water consumption as well as the generated amount of sewage.

### Costs

Evaluation of costs for cleaning processes poses a special challenge. Even within one country the prices for energy, water, agents etc. may vary, not to mention variations between different countries. To overcome these problems, CLEANTOOL provides an interactive feature, encouraging users to enter their individual labour-, energy-, water- etc. costs into the calculation interface and get back a customized estimation of cleaning costs.

Users may view single processes or they may compare different selected processes fitting their individual demands. In the first case they get the concrete energy and water consumptions as well as the amount of sewage plus the annual costs. In the second case the parameters are related to the removed dirt, in order to have a common gauge for the comparison. The values are then presented on the background of a scale based on all stored data.

### Community

Considering the vast amount of different cleaning requirements CLEANTOOL will not be able to answer all questions satisfactorily. For this reason the web presentation was also carefully developed. It will provide a fast means for all questions in the field of metal cleaning, e.g. by displaying optimisation potentials, developed by previous projects, by giving access to various magazines, specialists and practitioners, links to other databases, etc. CLEANTOOL aims at enhancing greatly the accessibility of information especially for the workshop practitioners.

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See also

[www.cleantool.org](http://www.cleantool.org)

<sup>1</sup> The column model is part of the German TRGS 440 (Download under: [www.hvbg.de/d/bia/pramodell/spaltee.htm](http://www.hvbg.de/d/bia/pramodell/spaltee.htm); an electronic version can be found under <http://www.aser.uni-wuppertal.de/>)