

# Cooling lubricants through the ages yesterday - today - tomorrow

Authors: Dr. Klaus Terveen, Manager Development Water-Miscible Cooling Lubricants,  
and Silvia Kählig, Manager Application Technology, Hermann Bantleon GmbH

Besides its product range, the company Hermann Bantleon GmbH, domiciled in Ulm, Germany, concentrates on user-specific concepts and approaches. Based on a holistic process approach, the lubricant specialist covers the complete process chain of the metal working industry. Combining custom-tailored product solutions with appropriate services is a challenge of the future. The manufacturing process is increasingly influenced by the complexity of the demands imposed. Upstream and downstream processes are of great importance – complementary product systems make the difference in final product quality. Bantleon develops and produces high-performance lubricants frequently adapted to the requirements of the respective customer and his processes. Ten years ago, cooling lubricants containing boric acid and amines were used predominantly. The boric acid content as a component of the concentrate often exceeded 5.5 %. In addition, it frequently contained biocides that were not subject to registration in the past. In the course of stricter classification guidelines, alternative formulations were found and tried in practical operation. The share of boric acid in all of Bantleon's concentrates is now below 5.5 %. Applicable frame regulations and process-related aspects are setting the trend. At present, cooling lubricants with boric acid are still being used, however with declining tendency. As expected, the demand for boron-free product concepts has increased significantly. The influence of national and international guidelines like

- REACH
- GHS
- CLP Regulation
- Biocides Directive
- chemical inventories such as EINCS, TSCA, DSL/NDL, etc.

on the development and application of cooling lubricants has tremendously increased for years and will keep on growing. The raw materials used in the product will have to be specified in the Material Safety Data Sheet under Item 3. The duty for labeling ingredients according to CLP Regulations will be increasingly extended to include labelling of concentrates. It is expected that the demands on cooling lubricant technologies will have to be defined on a regional or country-specific basis. Restrictions are already being faced these days concerning the global use of cooling lubricants. Looking on Europe, the trend is clearly towards boron- and biocide-free products. However, where the total price of a system filling and the expected lifetime is of major importance, products containing boric acid will continue to be preferred. The new types of cooling lubricants will rather be micro emulsions, i.e. with a low mineral oil content, with added lubricating components, may be renewable resources. The

advantages are

- reduced leakage,
  - thin layers on chips (facilitates the reuse of chips),
  - longer lifetime of cleaning baths (due to lower contamination).
- Especially for cutting high-strength materials (e.g. titanium alloys) a trend towards HP emulsions (stable up to 400 bars) can be realised.