Managing sumps and bacterial contamination

Equipment

- Cover sumps - keep them free from:
  - accumulations of swarf or fines; and
  - food, tea-bags and urine etc.
- Minimise leaks of tramp oil (hydraulic, lubricant, gearbox oil) into the sump. Remove tramp oil by skimming, by coalescers, or manually.
- Maintain and clean the system in accordance with the machine tool supplier’s instructions. You may also need fluid specific advice from your supplier.
- Measure the sump fluid temperature regularly and record your findings. Consider cooling the fluid if its temperature rises significantly above the workroom temperature.
- Eliminate any dead end lines in the fluid system.

Maintenance examination and testing

Fluid quality of water-mix fluids

- Check input water quality.
- Check for bacteria. One way of doing this is dip slide testing.
- Every day check the fluid appearance. Are there any reports of an unusual odour?
- Regularly check that tramp oil is less than 2%. Get advice from your fluid supplier on a suitable measurement method.
- Keep fines and dissolved metals within control limits. Well managed sumps typically have fines below 100 mg per litre of fluid – 100ppm. Get advice on condition monitoring from your fluid supplier.
- Measure the fluid concentration (refractometer) and pH every week.
- Follow your suppliers’ recommended levels of fluid concentration and pH.
- Ask your supplier for advice regarding measurement of biocide concentration.
- If you need to add biocide, choose a point of high turbulence - ensure complete mixing.
- Decide what precautions you need to take before approaching machinery and for handling biocides

Caution: Never overdose with biocide for routine use.
Dip slides
✓ Take dip slides once a week.
✓ If you want to reduce the frequency you need to demonstrate that your controls are effective. This includes:

- dip slide test records; and
- concentration and pH test records.

✓ Only a ‘competent person’ can advise on changes and recommend new testing intervals, eg priority being given to more vulnerable systems.
✓ Stir the sump before testing, to avoid tramp oil coating the slide.
✓ Use a slide incubator to keep the temperature for developing slides the same all year round.
✓ Incubate the slide at 25ºC for 48 hours, or follow the slide supplier's instructions.

Results from dip slides
✓ If you find only reasonable or poor control, investigate and take action.
    Control is defined as:

- Good control - less than $10^3$ CFU/ml (1 000 colony-forming units per millilitre of fluid). No further action is required now.
- Reasonable control - between $10^3$ and $10^6$ CFU/ml. You may need to clean the system, or change your biocide regime. Get advice.
- Poor control - more than $10^6$ CFU/ml. Act immediately. This normally means draining and cleaning.

✓ Or take any other measures which are equally effective.

Records
✓ Keep records of all tests for at least five years.
✓ Keep dip slide records in graph form. This makes it easy to spot gradual changes and to put in place systems to help you dose when necessary - see example on page three.
Useful links

- Your fluid supplier, as a member of the United Kingdom Lubricants Association (UKLA), can advise you on safe application of metalworking fluids. The UKLA can be found at www.ukla.org.uk.
- For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.
- See www.hse.gov.uk/metalworking.
- Contact the British Occupational Hygiene Society (BOHS) on 01332 298101 or at www.bohs.org for lists of qualified hygienists who can help you.
- Look in the Yellow Pages under ‘Health and safety consultants’ and ‘Health authorities and services’ for ‘occupational health’.
- Also see www.nhsplus.nhs.uk.

This document contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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Dip slide records
Keep your dip slide records in graph form to help you spot gradual changes and dose when necessary - see example below.

### BACTERIAL ACTIVITY

- **Machine**: Milling
- **Location**: Workshop 1
- **Plant No.**: 2
- **Capacity**: 200 litres
- **Product**: Fluid A
- **Concentration**: 5% by refractometer
- **Date of last fluid change**: 30/1/06
- **Sump clean and fluid change**

![Graph](image)

- **Bacterial count (CFU/ml)**
- **Week number**

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