



## CASTROL INDUSTRIAL EUROPE

### MAINTAINING METALWORKING COOLANT DURING EXTENDED SHUTDOWN

Proper maintenance of metalworking fluid (MWF) during an extended shutdown period is important. It can prevent foul odours, preserve coolant stability, and avoid downtime when production resumes.

#### PRIOR TO SHUTDOWN

Completing some work prior to the shutdown will aid the overall goal of returning to production with coolant in good condition.

##### CLEAN

Bacteria flourish in stagnant systems in which metal chips accumulate at the bottom and corners of the system and a floating oil layer at the top of the fluid prevents aeration from taking place. Clean out all accessible chips to remove bacteria havens. This includes chip pans, conveyors, chip troughs, and chips on the inside of the machine. Also, empty out the chip bins that the conveyors feed.

##### SKIM

Skim off free floating tramp oil (when the system is idle). This helps minimize the potential for tramp oil to seal the system from air. Wheel and rope skimmers work well, if used in the shop. Oil/water separators are also effective. A shop vacuum can be employed if no permanently installed equipment is available. Skimming tramp oil should also be considered during the shutdown as well, if oil is found collecting from leaks.



## LEAVE MACHINE CABINET DOORS OPEN

When machines are idle without coolant circulating, leave the machine cabinet doors open. This prevents a closed cabinet from becoming a humidity chamber, which can have condensate accumulate on the interior surfaces and wash away the rust protection of the remaining coolant film. If an extended shutdown is anticipated, beyond 2-3 weeks, consider using a rust preventive to protect bare metal surfaces (see list below)

## DURING SHUTDOWN

### CIRCULATE

Adequate circulation and aeration of the metalworking fluid makes it much more difficult for odour causing anaerobic bacteria to thrive. Circulate the system as much as possible during a shutdown to prolong the life of the fluid. Some machines have built-in programming to regularly circulate the coolant during shutdown. If circulation is not possible, an alternative is to use an air source to bubble air into the coolant to help prevent anaerobic bacteria growth.

### CONCENTRATION CONTROL

Over an extended shutdown, testing your metalworking fluid frequently and maintaining the concentration remains very important. If the fluid concentration is allowed to drop, some fluid components may become insufficient to maintain the bio-stable nature of the system. Many coolants are formulated with balanced levels of biocide and fungicide and/or other components highly resistant to bio activity. Routine monitoring of the concentration ensures that a depletion of the chemistry is avoided.

Continue to test the fluid normally, in accordance with the fluid's control plan, throughout the shutdown period. Additionally, good practice is to add a small amount of fresh fluid concentrate just prior to an extended shutdown to ensure that a portion of the fluid components are replenished.

### STARTUP

When coming out of extended shutdown, coolant systems should be circulated for several hours and concentration brought into proper range. If concentration is already within range, adding a small amount of coolant concentrate (about 1%) is still recommended in order to boost the coolant components.

In most cases, these actions will bring the Castrol coolant parameters back into control. In cases where it does not, the following products may be used for adjustment:

#### **Central systems & single sum systems in good condition**

- **Castrol pH Adjuster 400:** 0.2%
- **Castrol pH-Adjuster 401:** 0.2%
- **Castrol Inhibitor 611:** 0.2%
- **Castrol Techniclean 45 XBC** (not for aluminium): 1% to 3%
- **Castrol Techniclean 80 XBC or 90 XBC:** 1% to 3%

In case of high contamination with microbiology and their films, we recommend addition of biocides. **Handle biocides safely!** Potential products and concentration:

- **BODOXIN AE:** 0.2%
- **Acticide MV 14:** 0.02%
- **Acticide MV:** 0.2%

**IMPORTANT: Ensure all equipment components and pipes are rinsed with MWF (circulation or weekend mode). If this is not possible, the surface of the fluid should be monitored closely and kept free of oil (e.g. by skimming).**

### **Single sump systems in degenerated condition**

If the machine is heavily contaminated with foreign oil, swarf, chips or microbiology in combination with a low pH-value (< pH 8.9), we recommend:

- Clean and flush the machine with a system cleaner – e.g.
  - **Castrol Techniclean MTC 43** at 2% to 3% concentration
- Keep the emptied machine in “dry” condition
- If needed, protect critical components with additional corrosion protection – e.g.
  - **Castrol Rustilo WDP Spray**
  - **Castrol Rustilo DW range products**
  - **Castrol Rustilo corrosion protection oils**

## **ANOTHER OPTION**

Depending on the duration of the shutdown and the sump size, it may be more economical to drain smaller systems and recharge them when returning. Review the system history, while assessing site capabilities for monitoring concentration and circulation, to determine whether to drain or maintain the machine tool metalworking fluid.

Regardless if machines are empty or remain filled with coolant, remember to leave cabinet doors open to avoid rust-causing condensation. Also, if the shutdown is extended, apply a light film of rust preventive to fixtures and other metal surfaces.

Please review the Appendix for an Extended Shutdown Checklist with additional details.

If you have any further questions, please contact Castrol Technical Support.

# APPENDIX

## Extended Shutdown Checklist

1. Identify system(s) to be idled
2. Confirm duration of shutdown for facility or affected system(s)
3. Verify inventory of coolant concentrate and fluid additives (if needed) on hand is sufficient for shutdown period.
4. Confirm level of access (employee, visitor, vendor) to facility during shutdown
  - a. Will facility be staffed during shutdown, if so who/when?
  - b. What job role services will be available during shutdown?
  - c. Will vendors be allowed on-site during shutdown, if so, is access limited to set time(s)?
5. Verify availability of utility and engineering services during shutdown
  - a. Will utilities (electricity, compressed air, water etc.) be available fulltime or limited to a rolling schedule? If limited, what is schedule?
  - b. Will facility go "dark"? If so, when?
  - c. Will systems be circulated during down period?
  - d. Full system circulation (through flumes, overhead pipes, drop lines, side stream high pressure units etc.) or filter pumps only?
  - e. If circulation is limited to filters, will headers, remote plumbing, drop lines be drained back into bulk tank prior to shutdown?
  - f. Verify hours of circulation per day / per week
  - g. Is facility compressed air available for necessary controls or to aerate idled fluids?
  - h. Will water metering systems, proportioners, OWS (Oil Water Separator) units be active or disengaged during shutdown?
6. Assess system contaminant load
  - a. Chips
    - i. Remove all chips from chip pans, conveyors and return troughs
    - ii. Chip masses are great sites for bacteria and fungus to flourish
  - b. Tramp Oil
    - i. Verify OWS operation (if present), assess condition of unit
    - ii. Correct oil leaks (if present)
    - iii. Remove any free oil via skimming, OWS separation, vacuum, etc.
    - iv. Consider use of High Loft filter media in systems with heavy tramp oil loads
  - c. Residues

- i. Remove gross residue formations (if present) – oil, chips, swarf, suspect biofilms
- d. Filter cleanliness / efficiency (where possible)
  - i. Assess condition of bag/cartridge filters, replace/clean heavily fouled bags/cartridges
  - ii. Assess cleanliness of side stream high pressure units, clean heavily fouled units

7. Assess Fluid Condition of systems slated for shutdown

- a. Review system fluid condition reports, on-site system checks, or Castrol general condition analysis at least 2 weeks prior to shutdown
- b. If system is not routinely analyzed, submit representative fluid sample(s) to Castrol lab for general condition analysis.
- c. Respond to any recommended actions to treat bio activity or to raise concentration, and pH.

8. Leave Machine Cabinet Doors open when coolant not circulating

- a. Closed machine cabinets can have condensate form inside, especially over a chip pan and filter that contains coolant.
- b. Condensate can form on interior surfaces and wash off the coolant film that provides short term rust protection.
- c. Apply a light rust preventive film on machines that are anticipated to be idle for more than 2-3 weeks. See suggestions above.

If system conditions warrant treatment, please treat or adjust as recommended.

## Castrol Industrial Europe

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IT'S MORE THAN JUST OIL. IT'S LIQUID ENGINEERING.

