

# MECWASH CHEMICAL CONSIDERATIONS

## Which cleaner should I use?

The choice of cleaner depends on:

The substrate that is being cleaned and the residue on the substrate

The following provides a useful guide.

Please consult MecWash for further details and for specialist applications such as Aero-Space Projects.

CHEMICAL	APPLICATION/pH
AC-20	pH6.5 (concentrate)/7 (working dilution) Mild chemistry base for brass and aluminium alloys, will brighten; Very low residue cleaner; Suitable for single stage process without rinse; Removal of light soluble oils; only short term rust inhibition on ferrous parts
AC-20IF	pH 6.5(concentrate)/7 (working dilution) As AC20 but 'inhibitor free', making it ideal for ideal for yellow metal alloys; Will brighten and can be used without a rinse
AC-25	pH10.5 (concentrate)/10.1 (working dilution) Mild chemistry base; Multi-metal use; Low residue cleaner; Low foam; Excellent corrosion protection; Removal of light to medium oils; Also used as a 'Rust Inhibitor' additive in rinse tanks for ferrous parts
AC-25IF	pH10.5 (concentrate)/10.1 (working dilution) Mild chemistry base; Multi-metal use; Low residue cleaner; Low foam; Reduced ferrous corrosion protection; Ideal as an additive in rinse tanks for aluminium and brass.
AC-25 EAF	pH10.5 (concentrate)/10.1 (working dilution) Mild chemistry base; Multi-metal use; Low residue cleaner; Low foam; Excellent corrosion protection; Removal of light to medium oils; Also used as a 'Rust Inhibitor' additive in rinse tanks for ferrous parts. Benefits from enhanced antifoam package.
AC-30	pH 12.0 (concentrate)/10.6 (working dilution) Medium alkalinity, free of caustics and silicates; High detergency; Ferrous metals; Removes coolants, oils and greases; Short term rust inhibition; Also highly effective on plastics/plastic containers; No rinse
AC-32 & AC-32 EAF	pH10.5 (concentrate)/10 (working dilution) As AC30 but with multi-metal compatibility; Improved low foam and rust inhibition; Needs rinse for brass parts. EAF version has additional antifoam properties.
AC-32IF	pH10.5 (concentrate)/10 (working dilution) As AC32 but with reduced ferrous corrosion inhibition and ideal for aluminium and brass with very slight brightening properties.
AC-32S	pH10.5 (concentrate)/10 (working dilution) As AC32 but with enhanced oil splitting properties for use in high mineral oil and emulsified oil content applications.
AC-33	pH12 (concentrate)/11.5 (working dilution) Medium alkalinity cleaner for plastics. Can also be used for ferrous parts, but not suitable for non-ferrous alloys.

AC-35	pH 11.8(concentrate)/11.5 (working dilution) Medium alkalinity, no caustics or silicates; Multi-metal, except brass; Multi-soil; Excellent for high neat oil load situations due to rapid oil split; Aerospace approved; Needs a rinse
AC-36	pH 11(concentrate)/ 10-11 (working dilution) Medium alkalinity, free of caustics and silicates; High detergency; Low residue, Ferrous metals only; Removes coolants, oils and greases; Long term rust inhibition
AC-38 & AC-38 EAF	pH10-11 (concentrate)/10-11 (working dilution) As AC32 but with extra power for removing tenacious oils and other contaminants. Silicate free, Recommended for cast iron components, but also suitable for multi-metal applications; Needs rinse for brass parts. EAF version has additional antifoam properties
AC-39	pH 10-11 (concentrate)/10-11 (working dilution) As AC38 but with enhanced oil splitting properties for use in high mineral oil and emulsified oil content applications
AC-41	pH 12.5 (concentrate)/12 (working dilution) As AC42 but with enhanced oil splitting properties for use in high mineral oil and emulsified oil content applications
AC-42	pH12.5 (concentrate)/12 (working solution) High alkalinity, high detergency multi-metal cleaner and inhibitor with low foam properties
AC-44	pH11-12 (concentrate)/11 (working dilution) As AC38 but with extra power for removing highly tenacious oils and other contaminants. Recommended for cast iron components
S-5	pH3 (concentrate)/3-4 (working solution) Moderate acid cleaner for cleaning and brightening aluminium and brass, not for ferrous parts
Zinc Stearate Cleaner	pH3 (concentrate)/3-4 (working dilution) Organic acid cleaner for removing zinc stearate.
Polishing Compound Cleaner	pH11 (concentrate)/10.5 (working dilution) Moderate alkalinity cleaner for removing polishing compound
S-10	pH >1 (concentrated)/2.0 (working dilution) Machine de-scaling and cleaning acid
A-10	pH13.5 (concentrate) Alkaline solution for neutralising de-scaling acid
ADS-1	pH13.5 (concentrate) Alkaline solution for de-scaling Aqua-Save systems
WH-1	pH neutral Water hardness modifier to overcome foaming problems in soft water areas
AF-10	pH neutral General purpose anti-foam additive for cleaners and machining coolants
AFW-10	pH neutral Combined anti-foam and water hardness additive for low cleaner concentrations in soft water areas

AQD-10	Demulsifier for Aqua-Save pre-heat
AQF-20	Aqua-Save emulsifiable cleaner/foam control solution for cleaning solutions
AQF-30	Aqua-Save emulsifiable cleaner/foam control solution for floor cleaning solution and coolants
AQ-30	Aqua-Save emulsifiable cleaner
AQF-60	pH 10 - Aqua-Save emulsifiable cleaner/foam control solution, high strength version

### **Can I use the cleaner in both the wash and the rinse?**

Yes, in most cases, the wash chemicals are formulated to function in both the wash and the rinse. We recommend that you consult MecWash to discuss your application on an individual basis.

### **What concentration should the wash cleaner be?**

MecWash cleaners are typically designed to be used at 3 to 5% in the wash solution  
If the residue is more tenacious, a higher concentration may be required  
For example > 6% for some polishing compound applications and > 8% for Aero-Space and NDT applications  
In other cases, concentration levels as low as 2% can be used, however only on consultation with MecWash

### **What concentration should the rinse chemical be?**

Typical concentration range 0.1 to 1.0%  
Highly application dependent, consult MecWash for individual cases

### **How do I measure the concentration of the cleaner?**

MecWash can supply a tablet test method, which avoids the use of hazardous chemicals and glassware.

For example AC32 is tested as follows :

- 1) Take a 50ml sample from the wash tank immediately after the end of the cycle using the 250ml sampling jug supplied; allow the solution to cool to room temperature.
- 2) Measure 20ml of wash solution into conical flask, using the measuring cylinder; add a further 80ml of tap water.
- 3) Add the test tablets one at a time, with vigorous shaking each time, until the end point; ensure that each tablet is fully dissolved before adding the next one.
- 4) The end point is when the colour changes from the original yellow colour, through the intermediate colour range, to crimson red. Add one more tablet to check that the red colour does not intensify. NB if the wash solution is dirty, the end colour may not exactly match the crimson red colour. NB, do not include the final tablet in the concentration measurement.
- 5) Note total number of tablets used.

11 tablets = 3.1%

12 tablets	=	3.4%
14 tablets	=	4.0%
16 tablets	=	4.5%
18 tablets	=	5.1%
20 tablets	=	5.7%
22 tablets	=	6.2%

### Notes

It can be quite easy to lose count of the number of tablets added. A useful hint is to take 25 tablets from the bottle. Use these for the test and obtain the number used by difference.

After carrying out a determination, wash all apparatus with fresh, clean water and dry

The cleaner is designed to be run at 3 to 5%, so expect to use 11 to 18 tablets for 20 ml sample

### Test Kit Contents:

#### Description

1. Sampling Jug
2. Measuring Cylinder
3. Tweezers
4. Conical Flask
5. Test Tablets

### **Can I use my existing equipment to measure the strength of the cleaner?**

Yes, however, as there are many different combinations of acid, acid strength, and type of indicator and over 30 different MecWash products, it is recommended that the customer uses the test kit tested and provided by MecWash.

### **How long will the wash solution last for?**

Depends on individual usage, days to months, and whether an Oil Separator and / or Aqua-Save is available to keep the solution clean. Using the Oil Separator / Aqua-Save combination can enable indefinite solution life in some cases.

### **How long will the rinse solution last for?**

Depends on individual usage, days to months, and whether an Aqua-Save, carbon demineralised or specialised filtration mechanisms are available to keep the solution clean. Using the Aqua-Save combination can enable indefinite solution life in some cases.

### **Can I dump the wash solution down the drain?**

Where possible, MecWash use environmentally friendly ingredients for their cleaners, however, as soon as the wash solution has been used to clean components, the wash solution becomes contaminated with the residue from the components. It is that nature of the residues that need to be considered, rather than the MecWash detergent.

MecWash therefore developed the Aqua-Save unit to clean-up the wash solution to reduce, or remove the necessity for dumping the wash solutions. In the event that the wash solution needs to be disposed of, confirm disposal procedures with environmental engineer and local regulations.

#### **Why is my wash chemical a different colour?**

The wash solution will take on the colour of the residues being removed from the components; using an Aqua-save unit will reduce the concentration of any contaminants in the wash solution and extend the solution life.

#### **What is the maximum concentration of oil that I should have in the wash solution?**

Depends on the level of cleanliness required; the lower the oil content the better, typically less than two to three percent would be required for most applications, but significantly less than 1% for more critical applications.

NB, customers washing very dirty components, or with high oil levels may experience significantly higher levels and may therefore require the addition of demulsifying chemical(s) to help control the oil content.

#### **Why is the wash solution foaming?**

Is the correct detergent being used? Is the detergent concentration too low. Is the process temperature too low? Check temperature of solution returning from the process chamber independently with calibrated thermometer. Is the level of contamination too high? Is the Aqua-save / oil separator working? Has a foreign body been processed? Are products containing a polishing compound, or other "soap forming" media being processed? Have the metal working solutions or other contaminant on the components been changed, are they in specification? Is the water very soft? Is a water hardness modifier being used?

#### **Why is the Rinse solution foaming?**

See above

#### **Why are my parts discoloured?**

Is the correct detergent being used and at the correct concentration? Has the type and nature of the substrate changed? Is the temperature of the process solution too high for the components? Is the hot air dry temperature too high or operating for too long? Is the wash chemical too dirty? Are the wash or rinse filters blocked or over-contaminated? Is wash chemical being left on the surface? Is the rinse process removing the wash chemical from the component surface? Is the final mist rinse process working? Is ultrasonics being used on sensitive substrates or surface finishes?

#### **Why are my parts corroding?**

Is the correct detergent being used and at the correct concentration? Is a non-inhibited rinse being used for ferrous components? Are the parts already corroded prior to entering the wash process? Are the process solutions hot enough? Is the correct process being used? Is the hot air dry functioning correctly? Is the water supply quality suitable i.e. contaminants such as salt can cause corrosion. Are the parts exiting the process clean and dry? Is the storage after processing sufficient? Is a volatile corrosion inhibitor required to protect the components? Are too many components being processed simultaneously?

**Why are my parts wet?**

Are the solution process temperatures correct? Check independently with calibrated thermometer. Is the hot air dry functioning? Is the vacuum dry functioning? Has the process changed? Does the machine require a service? Are there too many parts in the process basket?

**Why do I have white spots on the components?**

Is the correct detergent being used and at the correct concentration? Is the process temperature correct? Is the level of contamination too high? Is the rinse solution removing the wash chemical from the surface? Are the parts already in this state prior to processing through the MecWash machine? Is the coolant being used in the metal working machines suitable for the substrate and being maintained within specification? Are there too many parts in the process basket? Is the water supply to machine soft or hard?

**What is the recommended operating temperature range of the wash and rinse solutions?**

The majority of MecWash detergents can be used between 60°C and 85°C. Operating at lower temperatures could result in foaming of the wash solution and operating at higher temperatures could result in a breakdown of the detergent formulation. Please consult MecWash for further details.

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