

## 90%+ FLUID RECYCLING AT NISSAN



Any company facing growing demand for its products naturally welcomes the challenge with open arms. But, along with increased production comes the potential for increased waste and that needs dedicated management. Nissan Motor Manufacturing (UK) Limited is a case in point.

At the NMUK plant in Sunderland, increased production of cylinder heads led to its swarf-wrapping system extracting upwards of 1000 litres of machining fluids per day. This was disposed of as waste and the cost was spiralling. For a company keen to embrace ISO 14000 - the series of international standards on environment management - a radical re-think became vital.

### First in UK

The Unit Machining Engineering Section was therefore charged with the responsibility of reducing the volume of waste, principally in the form of soluble oil products and wash fluids. Recycling was the obvious conclusion and we, at Master Chemical Europe, have provided the solution. The resultant system was installed in March 2004 and it is the first fully automated system of its type in the UK.

NMUK's introduction to Master Chemical Europe came at a Coolant Management Seminar held at St. James's Park, Newcastle. We are unique in the marketplace, as the company is both a manufacturer of metalworking fluids and of recycling equipment. We therefore had the necessary expertise to tailor a system to meet NMUK's needs precisely.

### Fluid management

Our approach recognises coolants as a production item, not just machine maintenance fluids. Good fluid management requires the monitoring and control of all coolant/wash fluid related variables. This not only results in freedom from coolant/wash fluid waste disposal problems, it also optimises tool life, increases productivity, improves the overall shop environment and adds a regular and significant profit contribution to the bottom line.

At the heart of the system that we designed for Nissan Motor Manufacturing (UK) Ltd., is a mobile XYBEX® 3000 Autodesludge Centrifuge Recycling System. This is a water miscible fluid recycling system, specifically configured to remove tramp oil and particulate matter from coolant and wash fluids. It accepts fluid from central

coolant systems, batch tanks and parts washers using a self-priming centrifugal pump and then returns the recycled fluid to the system or holding tanks by means of an in-built centripetal discharge pump.

### 8 microns or less

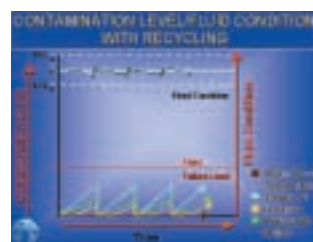
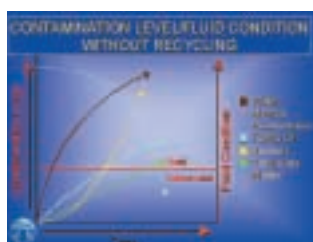
The unit is equipped for use on high temperature and high pH fluids. And being mobile, it is able to process fluids in different locations within the Sunderland factory. With a flow rate of 750-1400 litres per hour dependant on the type of fluid used, the XYBEX® removes both free and emulsified tramp oil to 0.5% or less and particles down to 8 micron or less.

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The associated XYBEX® tank system is a Master Chemical standard design and fully automated to operate with the mobile XYBEX® system. It holds coolant from NMUK's chip wringer or from standalone machine tools in a 2000 litre capacity holding tank, ready for processing by the XYBEX® 3000. The fluid is then pumped to the production fluid top-up tanks or directly to the central system.

The third option open to NMUK is for the fluid to be transferred to a mobile XYBEX® Junior System. This is a single product coolant recycling system with a flow rate of 350 - 500 litres per hour and ideal for use with the company's standalone machine tools.

The initial aim of the MCE Waste and Fluid Management System was to reclaim between 60% and 80% of these production fluids. The system is substantially exceeding this target. "We are currently hitting 90% - 95%," NMUK's Steve Tobbell concluded. "A great result for us and for the environment."



## NEW DISTRIBUTOR FOR IRELAND



In just six years, AquaChem Limited has become the third largest water treatment services company in Ireland. With fourteen employees, it now has more than 200 customers ranging from major food manufacturers to injection moulders. In addition to designing water treatment systems, the company offers a variety of allied services including water testing.

It is this facet of the business that has led to AquaChem becoming our strategic partner in Ireland. As owner Kieran Coleman explains, "We're used to testing for bacterial concentration and pH in water so our providing a testing service for production fluids is a natural progression."

In addition to expanding its service activities, AquaChem will also supply the full range of TRIM® metalworking fluids and in particular TRIM® C270 that has proved to be so popular with Irish manufacturers. This is a hybrid cutting and grinding fluid formulated to have the best characteristics of both synthetic and semi-synthetic fluids.

AquaChem Limited is at Unit 9, Dunboyne Business Park, Dunboyne, Co. Meath, Ireland.

Telephone: +353 1 825 2775  
Fax: +353 1 825 2783

## MINIMAL LUBRICATION

Interest in minimal lubrication is growing. Drastically reduced fluid consumption, minimum stock holding and no in-use care and attention are the cost- and timesaving benefits behind this trend. Those adopting this policy produce near-dry chips with increased value. Components have less tendency towards built-up edge than with dry machining. And from a health and safety point of view, fewer fluids on the shop floor equal a cleaner working environment.

To meet this need, we have added to our product programme, a dedicated range of minimal lubrication fluids. The range includes TRIM® TAP NC a synthetic tapping compound, with built-in emulsifiers for applications where parts cleaning is still desirable. It is available in light, medium and heavy grades.

A new addition to this range is TRIM® ML 55B, a low viscosity mixture of vegetable and mineral oils, which is having good success in mainland Europe through the Master Chemical distributor network.

Master Chemical minimal lubrication fluids are formulated to be mixed and dispersed through a stream of compressed air and the resultant mist applied externally or through-the-tool. Under suitable circumstances, this method can replace flood coolant or those dry machining operations where built-up edge may occur.

A typical operating quantity of these TRIM® fluids to produce components and chips that can be classified as dry, is 25ml per hour.

# ANOTHER HIGH PERFORMER

High chemical and mechanical lubricity, minimal maintenance and a formulation suited to the most demanding of fluid management systems are the distinguishing characteristics of our new high quality, universal soluble oil, TRIM® E805.

The stability of this latest addition to the TRIM® range makes it the perfect choice for consistent parts manufacture. Its qualities have already earned it the approval of one of the world's leading aero-engine OEMs.

As well as a long operational life, it is also formulated for both grinding and machining. In high-speed turning and milling, TRIM® E805 has the perfect balance of cooling and lubrication qualities to provide superior tool life and surface finish.

During trials, one manufacturer was able to increase the surface quality on its aluminium tail rotor supports significantly by switching to TRIM® E805 as well as greatly extending sump life. Tool life was an issue at another trial site - a manufacturer of aero-engine turbine and compressor blades.

In this trial TRIM® E805 was installed in a Bridgeport VMC1000, a machining centre responsible for the

heaviest duty cutting. Whilst previous coolants had made little contribution to reducing the excessive and expensive tool wear, the new TRIM® fluid concentrate made - and continues to make - a big difference.



TRIM® E805 has been designed to protect machine tool surfaces while also preventing sticky ways; the coolant is easily removed with water, working solution or aqueous cleaners.

Extremely hard water tolerant, this new emulsion has a fine particle size that reduces carry-off and facilitates the fluid's delivery to the cutting point. TRIM® E805 is

compatible with aluminium, steel alloys, cast iron and yellow metals and is easily recycled.

As expected from a new addition to our coolant family, TRIM® E805 does not need costly and hazardous additives such as phenol to maintain its long life. Its non-chlorinated and non-sulphurised formulation controls build-up even in the toughest of operations. This was confirmed by a manufacturer of aluminium profiles who was experiencing residue problems with its existing coolant.

TRIM® E805 was put to the test in a CNC machining centre, employed to roll tap M3 aluminium profiles. Not only did TRIM® E805 keep the machine clean with no residue problems common to the previous coolant, it was also used at just 10% concentration. The old coolant did not even deliver this performance at 15% so thanks to TRIM® E805, this company improved quality and reduced costs.

## NEW TO THE 'E' SERIES EXCELLENT FOR HARD WATER



TRIM® E705 is a new, high quality universal soluble oil that requires minimal maintenance in even the most demanding fluid management systems.

It is suitable for a broad range of machining and grinding applications and for a wide variety of materials - from aluminium and steel alloys to cast iron and yellow metals. This is a stable emulsion whose chemical and mechanical lubricity makes it the ideal choice for high quality, consistent parts manufacturing.

Features of this new product include higher alkalinity in dilution and an improved biocidal package to ensure even better sump life, particularly in hard water environments; it has been formulated to run in up to 900 ppm. And naturally this improved performance has been achieved without compromising its 'green' credentials.

In high-speed turning and milling, TRIM® E705 has the correct balance of cooling and lubrication to provide good tool life and surface finish. It does not foam and will run effectively for long periods without the need for costly additives. Its fine particle size reduces carry-off and ensures the point of cut receives consistent coolant supply.

TRIM® E705 leaves an oily residue to protect the machine and fixtures that can easily be removed with water, working solution or aqueous cleaners.

## Success in the field

Field trials of the product have proved highly successful. Its superior sump life and performance in a hard water area were confirmed by a motorsport component manufacturer. The emulsion was used in both a lathe and a milling machine for the production of aluminium and steel parts. The customer also reported improved machine cleanliness and low odour.

Having reported its existing coolant was degrading in 4 - 6 weeks, a company in the aerospace sector was also selected to put TRIM® E705 to the test. As well as aluminium and steel, the company machines Modulan - a lightweight, hard material used for scale model testing. It confirmed no degradation or discolouration of the Master Chemical fluid during the test period and complete satisfaction in the fluid's subsequent performance.

## ALL THE BENEFITS OF EP SOLUBLE OILS ... and more

Improved tool life, low foam, improved machine cleanliness and low odour were some of the main production benefits proven at trials of our new TRIM® E905. The product trials, conducted by aerospace and automotive manufacturers, involved tapping and reaming holes down to M2 in aluminium billets.

Thanks to its stable formula, TRIM® E905 has also provided long operational life and consistent performance during a trial with a subcontractor. Again the customer used this new coolant in the drilling, tapping and reaming of cast aluminium at a pressure of 40Bar.

TRIM® E905 is now this company's preferred option. Unlike its previous coolant that had been showing signs of separation in the machine sump, TRIM® E905 demonstrated a far superior sump life and delivered high quality surface finishes.

Formulated to have cutting and grinding performance equivalent to our high EP soluble oils, TRIM® E905 also has several additional characteristics. Features of this improved product include higher alkalinity in dilution, improved sump life - particularly in hard water areas - and good corrosion protection.

This new addition is ideal for multi-metal job shops as it is suitable for ferrous, non-ferrous and non-metallic machining. In common with its forerunners in the TRIM® range, TRIM® E905 contains no nitrites, secondary amines, nor phenolics. It has been formulated to comply with all current and anticipated health and safety legislation and is therefore classified as non-hazardous under the new CHIP 3 regulations.

As is expected of any new coolant from Master Chemical, TRIM® E905 is suitable for recycling with good tramp oil separation and without significant changes in emulsion characteristics.

## UNSUPERVISED FOR UP TO A YEAR

The higher level of automation provided by the Master Chemical Xybex 3000 recycling system was a key criterion for another of our automotive customers. The programmable filters together with the self-cleaning pre-filter and centrifuge enable the unit to run without supervision or maintenance for long periods. This can be up to six months. And after a service, a further six months can be expected.

The fully automated Xybex 3000 with programmable controller has been in operation since August 2002. It was purchased to control tramp oil and particulate contamination in two central coolant systems totalling 105,000 litres in coolant volume.

It is programmed to recycle fluid from each of the central systems on a preset interval but can be manually overridden should, for example, one of the systems require greater attention to remove heavier oil leaks. The system works by taking coolant from one of the central systems and passing it through the self-cleaning, media-free filter. It is then fed through a high-speed, self-desludging centrifuge. This removes free and emulsified tramp oil to below 0.5% and particulate to below five microns in size.

Finally, the centripital pump on the centrifuge returns the recycled coolant to the central system. This process continues on bypass until the end of the preset cleaning cycle at which point the Xybex 3000 system automatically switches over to the other central system.

This system was chosen in preference to other cheaper systems and the customer confirms it is worth every extra penny.



• MASTER CHEMICAL - the ORIGINAL Coolant Management Company •

Master Chemical Europe, Maitland Road, Lion Barn Business Park, Needham Market, Suffolk IP6 8NZ

Tel: +44 (0)1449 726800 Fax: +44 (0)1449 721719

www.masterchemical.co.uk e-mail: info@masterchemical.co.uk