FILTRATION news
4
2001

Greetings

Welcome to the latest issue of FILTRATION NEWS.

In this issue we will be talking about emulsions and water-based solutions, among other things. We think that our experience with these products could be useful to you, even though the current trend is to use more unmixed cutting oils.

I am pleased to announce that we have nearly finished the expansion work on our factory. We have added an extra 3,200 m^2 to our existing capacity.

We will also be changing our trademark and our company name to KENFILT.

We set up NOVOTECNIC 30 years ago when we went into filtration, 7 years after starting our business. At that time, it was a novel and original name, but over the years, "NOVO" has become so popular that we feel we now need to differentiate by adopting a new trademark.

We hope that KENFILT will continue to enjoy the good reputation for hard work and seriousness that NOVOTECNIC has earned worldwide.

Yours cordially,

JAUME LLEAL
Executive President

The filter is never guilty



Band filter with hydraulic vacuum TADE 12 DA 30 (3.000L/MIN.)

During a technical conversation about filtration and different systems and types of filter, Mr. Lorenz Klein, manager of Kabelschlepp Int. said... *"THE FILTER IS NEVER GUILTY, bad yield is due to INCORRECT USAGE"... We have adopted this* concise and clear "rule" as our own.

After 30 years of experience designing and selling installations and filters for all types of liquid used in the Metallurgical Industry, we know IT IS TRUE - the filters are good ... correct application is key, i.e. the right filter for the right use.

For filtering and cleaning liquids used in the metallurgical industry, the most important thing is to choose the right filtration system.

This choice must never be left to "amateurs".

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Hannover
12-19·9·2001
Halle 026 / Stand E 19

novotecnic

KENFILT

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Experts with an excellent knowledge of machinery and productive processes invariably have little or no experience of filtration systems. This often leads to the wrong filtration system being chosen.

The wrong choice of system leads to poor results and the conclusion that **the filtration system is not good. What's has really happened is that the choice of filtration system was wrong.**

- **The decision on which filtration system to use should always be taken by professionals with a comprehensive knowledge and experience in the study, design and manufacture of filtration systems.**

NOVOTECNIC's Filtration Engineering Office has more than 30 years' experience of designing and developing new filtration equipment.
CONSULT US !!

Emulsifiable or water soluble coolants

Emulsion manufacturers currently have a number of products on the market that can give excellent results, provided that a series of basic principles are taken into consideration when choosing the emulsion. The main factors to bear in mind are:

- The work to be done (grinding, turning, milling, boring, rolling, etc.)
- The compatibility of the products
- Sanitary-hygiene considerations
- Environmental protection

CHOOSING THE BEST LIQUID FOR THE JOB

In most cases, products supplied by different manufacturers can be fully tested. They can be tried out on one or several machines to gather real data on their performance in terms of production (cutting speed, advance, consumption of tools or grinding wheels) and finishing quality (surface texture, geometrical quality).

On the basis of this analysis, it is then possible to determine which product has given the best results for the job.

However, it should be borne in mind that the product that gives the best yields often has to be disregarded because of compatibility problems with other products used in the process (sanitary-hygiene problems or environmental considerations).

Compatibility with other products used in the production process

When choosing an emulsifiable or water-soluble coolant, it is always necessary to check that it is totally incompatible with:

- **Hydraulic oils**
- **Lubricating oils**

This is very important to ensure that any leaks of hydraulic or lubricating oils from the machines cannot be emulsified in the coolant fluid. This would alter the effectiveness of the fluid and give rise to a number of problems, such as reduced efficiency and blunt grinding wheels, etc. This is very easy to test by mixing the cutting fluid with 10-20% of the hidraulic or lubricating oils used in the machines.

Shake the mix vigorously and leave to settle. After 60 seconds, all the hydraulic and lubricating oil should be floating on top of the coolant.

If only a small part of the oil is floating, this indicates that the rest of it has been emulsified.

This means that the oil is compatible with the liquid. In this case it will be necessary either to change the water-soluble or emulsifiable product, or change the machines' hydraulic and/or lubricating oil for one that does not emulsify.

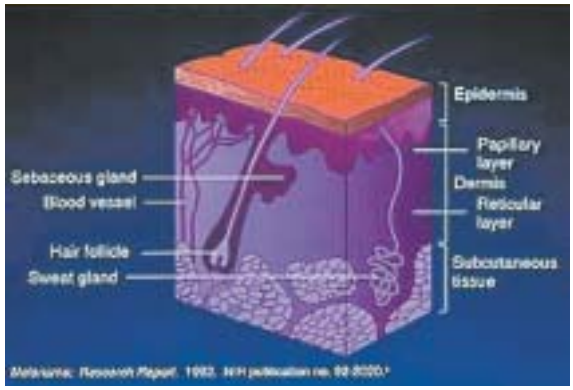
Degreasing liquids

Care should be taken that the degreasing liquid, which can impregnate the material machined, do not alter the coolant liquid.



If possible, water-based degreasing liquids should be chosen, as solvents can cause problems when they are mixed with water-based coolants.

Sanitary-hygiene considerations



It is important that the product should not cause any skin reaction or have an irritant effect.

The supplier of the emulsifiable or water-based product should confirm that it would not harm the skin of workers who might be in contact with the product.

It is also advisable that the manufacturer of the water-soluble or emulsifiable product should also supply the skin protection products. These are especially designed so that the workers who are in contact with the coolant in question are well protected against reactions from product incompatibility.

Environmental consideratons

It is essential to check legal restrictions and regulations in force in the area where the product is to be used. For example, the following factors should be taken into consideration:

- Laws relating to water resources
- Regional water laws
- Rules and regulations relating to industrial plants
- Administrative regulations about this type of plant

The cost of environmental protection measures will depend on the degree of contamination of the product's components.

Coolants with formulations containing boron and its derivatives are considered to be products that contaminate vegetation. Although the derivatives delay bacterial growth, they also facilitate the growth of fungus. For this reason, formulations with boron derivatives must contain fungicides (another environmental contaminant).

It is important to bear in mind that formulations with boron derivatives and amines can also cause chemical reactions resulting in dangerous nitrosamines. All this can lead to the need for very expensive installations to ensure that the ground and subsoil cannot be contaminated in any way, by spills or by constant or intermittent leaking of coolant liquid with formulations containing boron.

At present, there are water-based cutting liquids, which do not contain boron or amines. It is also important to note that products without boracic acid and amines have the advantage of being the most suitable ones for machining both ferrous and non-ferrous materials.

Substances that are harmful to water

INSTALLATION VOLUME m^3		WKG			
		0	1	2	3
		NOT HARMFUL	SLIGHTLY HARMFUL	HARMFUL	VERY HARMFUL
0	<0,1	A	A	A	A
>0,1	<1	A	A	A	C
>1	<10	A	A	B	D
>10	<100	A	A	C	D
>100	<1000	A	B	D	D
>1000		A	C	D	D

WKG
Water nocivity degree in Germany

NOCIVITY DEGREE	
A	Low
B	Medium
C	High
D	Very high

Protection requiriments

An example of these types of control can be found in the protection requirements for ground level storage installations in NORTHRHINANIAN-WESTPHALIA in Germany.

INSTALLATION VOLUME m^3	WKG 0	WKG 1	WKG 2	WKG 3
0 <1	F0, R0, I0	F0, R0, I0	F0, R0, I0	F1, R2, I0
>1 <10	F0, R0, I0	F0, R0, I1	F1, R1, I1	F2, R2, I0
	—	—	—	F1, R3, I0
>10 <100	F0, R0, I0	F1, R1, I1	F1, R1, I2	F1, R2, I0
	—	—	F2, R2, I0	F1, R3, I0
>100	F1, R1, I0	F2, R1, I2	F1, R2, I0	F2, R2, I0
	—	F2, R1, I1	F1, R3, I0	F1, R3, I0

F Protection and Surface Sealing	R Retention capacity	I Substructure, organising and technical measures
F0 Not necessary	R0 Not necessary	I0 Not necessary
F1 Impervious surface	R1 Depending on leak potential without preventive measures	I1 Supervision with automatic failure warning devices in the case of work rooms that are occupied full- irregularities are noted
F2 As F1, but with steady water-tightness and constant resistance. Drip tray if necessary	R2 Depending on leak potential without preventive measures	I2 Undertake a plan of alarms with measures
	R3 Double wall with leak indicator	

Choice of filtration equipment for water-based liquids

When purifying or filtering water-based liquids, it is just as important as it is with oils to collect data that will help to understand the problem to be solved and to find the right solution.

Basic technical data necessary to determine the features of the filtration equipment

MATERIAL MACHINED
- Steel ☐
- Hardened steel ☐
- Drawn steel ☐
- Casting ☐
- Pig iron ☐
- Nodulous casting ☐
- Copper ☐
- Brass ☐
- Zamac ☐
- Aluminium ☐
- Magnesium ☐
- Speed steel ☐
- Hardmetal ☐
- Ceramics ☐
- Others ☐

TYPE OF MACHINING
- Milling ☐
- Boring ☐
- Drilling ☐
- Deep drilling ☐
- Grinding ☐
- Outside ☐
- Inside ☐
- Grooves ☐
- Profiles ☐
- Honing ☐
- Inside ☐
- Outside ☐
- Cold rolling ☐
- Hot rolling ☐
- Spark erosion ☐
- Chemical erosion ☐

TYPE OF ABRASIVE
- Corundum ☐
- Carborundum ☐
- Diamond ☐
- Borazon ☐

BINDING AGENT
- Ceramic ☐
- Resin ☐
- Rubber ☐
- Metallic ☐

TYPE OF COOLANT %
- Emulsion ☐
- Synthetic solution ☐
- Semisynthetic solution ☐

TYPE OF CHIPS %
- Short ☐
- Long ☐

TYPE OF SLUDGES %
- Polyhedral shape ☐
- Fibrous shape ☐

QUANTITY KG/H
- Metal chips ☐
- Sludges ☐

SURFACE QUALITY
- Ra ☐
- Rz ☐

TEMPERATURE CONTROL °C
- Temperature wanted ☐
- Cooling water available ☐
- Power installed in kW ☐

The importance of temperature control for coolant liquids

It is becoming more and more important in the machining processes in the metallurgical industry that the liquids used in the production process are kept at a constant temperature. A number of factors depend on this:

- The structural stability of the machine
- The dimensional quality of the product
- The yield of the tools
- The performance of the machine
- The stability of the coolant

All these factors have an influence on the end product. By controlling the temperature of the coolants, the number of rejects can be reduced, and profits increased.

For example, in the machining process of a flat surface of a Diesel injection pump, a variation of only 3ºC in the temperature of the coolant can vary the automatic control of the part during the machining process. This leads to rejects, as the pieces are no longer within the required tolerances.

Therefore, cooling equipment is needed in central filtration plants to keep the coolants at a constant temperature.

THE MOST FREQUENTLY USED TYPES OF TEMPERATURE CONTROL EQUIPMENT ARE:

A **Cooling units with compressor and evaporator immersed in the liquid to be cooled.**
This type of equipment is very compact and has the advantage that it can be installed directly in the clean liquid tank. It is usually used only for medium power – up to 40,000 Kcal/h. The disadvantage is that it cannot be expanded.

B **Heat exchanger cooling units.**
In this type of equipment, the liquid to be cooled is made to circulate through a heat exchanger. Cold water circulates through the secondary circuit. The temperature is controlled by means of an assisted servovalve. This type of equipment has the advantage of not having any power limit and, it can also be expanded.

C **Water cooling units.**
For medium and high power installations, water-cooling units are always used combined with heat exchangers.
These cooling units have a water circuit. Once the water has been cooled, it is then sent to one or more cooling units with heat exchangers.



COOLING UNITS CAN BE EQUIPPED WITH DIFFERENT TYPES OF CONDENSERS

- **Air-cooled**. All the heat absorbed from the liquid is expelled into the air on the factory floor. This can be a disadvantage in hot countries.

- **Water-cooled**. A circuit of water-cooled by means of an evaporation tower or other system.

- **Evaporative**. These systems are used in warm countries when large cooling power (>250,000 Kcal/h.) is required. The dimensions and energy consumption of the refrigerating compressors can be reduced by 20%.

All these different types of equipment are manufactured by NOVOTECNIC, using the best materials on the market (**Bitzer, Copeland, Danfoss, Alfa Laval**, etc.)



PAMA saimp

PAMA-Saimp has developed the GALILEO high performance grinding machines project, used in the manufacture of camshafts and crankshafts for motors.



This grinding machine has been developed to work with CBN grinding wheels, and it has a number of technological innovations that makes it very competitive.

One of the results of this project is the confidence shown by VOLKSWAGEN Group's SKODA with the purchase of two machines for its factory in Mladá Bolslav in the Czech Republic.

Pama-Saimp has entrusted NOVOTECNIC with the supply of the filtration equipment incorporated in these grinding machines with borazon grinding wheels.

Pure cutting oils are vital for maximum performance with borazon grinding wheels (see Filtration News No. 1). So NOVOTECNIC has developed the FTD 9 AD DO type precoating filtration equipment, especially designed to be coupled with these grinding machines. A 35,000 Kcal/h. cooling unit is incorporated, as well as clean oil distribution pumps of up to 80 bars for cleaning the borazon grinding wheels.



News in brief

The Delphi Group invests 96 million Euros in its diesel engine pumps in Sant Cugat.

As part of its plan for diesel pump development, Common Rail, the company behind the Delphi Group, plans to increase its investment in the factory to increase production to 2 million Common Rail diesel pumps per year.

The project will be developed in several stages to be completed in 2004.

Strict quality levels are required in the manufacture of this type of pump. NOVOTECNIC is supplying the centralised filtration system for the cutting oil, to ensure the necessary levels. The system consists of 3 central filtration plants 2 FTD 60 AD TA with a total flow of 15,000 l/min. for the flexible machining lines, 2 central FTD 12 AD TA plants with a total flow of 1,200 l/min. for the grinding operations.

All the central filtration installations dispose of a cooling system in order to maintain the oil temperature at 25ºC.

JAGUAR implants cast iron jackets on the cylinders of the 8-cylinder aluminium V motor block

Jaguar has added a Gehring honing machine to the production line for the first finishing process on its turned and bored cast iron jackets. The jackets are then fitted to the motor blocks before the final honing and superfinish. NOVOTECNIC has supplied a 120 l/min. FTD 4 AD TA filtration equipment for semi-synthetic water-based honing solution.

The equipment can use either cellulose or diatomite as filter-aid material. It also has a cooling system to keep the honing solution at a constant temperature. This is essential to maintain the strict tolerances required for the production of a high performance engine.

FRITZ SCHIESS AG installs a central filtration plant for synthetic grinding in its factory in Lichtensteig, Switzerland.

This important Swiss manufacturer of high precision fine cutting dies has decided to change its grinding machines' cleaning equipment (centrifuges, hydrocyclones, magnetic separators, paper band filters, etc.). SCHIESS has chosen a NOVOTECNIC BPR 70 DA 7 central filtration plant capable of filtering a flow of 700 l/min. of synthetic grinding solution.

The central filtration plant has a settling tank before the filtration process so that only a minimum amount of sludge will get through to the paper band drum filter.

This means that a high capacity filter paper can be used. The consumption of filtering paper is low as only small quantities of sludge are retained.

HAM-LET, one of the world's top manufacturers of special steel tube fittings for the Pharmaceutical, Chemical, Electronic and Aerospace industries, has chosen to purchase a FTD 40 AD TA central precoating filtration plant for filtering the 1,100 l/min. flow of cutting oil. HAM-LET has also ordered a 2 FTD 75 AD TA + 2 DL 80 central plant for a 14,000 l/min. distribution flow of cutting oil, to be installed in its new machining plant.

The exceptional internal finishing quality required in the type of tube fittings and components manufactured by HAM-LET, makes it necessary to ensure that the oil is completely free of any particles in suspension as it reaches the tools. These could damage the finished surface of the machined part.

HAM-LET has disregarded existing depuration equipment with paper bands and centrifuge as being inefficient (see FILTRATION NEWS 2) in favour of NOVOTECNIC's precoating central filtration plants. These meet ISA 4406 code 19/16 standards for solid contents and even stricter qualities, such as code 16/13, when using the proper filter aid.

We shall always remember him



2000 was a good year for all of us at NOVOTECNIC in terms of our achievements and future prospects, but it was also a very sad year for us.

Our colleague, José Carlos Sánchez died in June 2000. For 12 months he fought bravely against a serious illness. His calm and serenity were an example to us all.

José Carlos came to work with me when he was 16. He was 41 years old when he died, so all his working life – 25 years – was spent with us.

Needless to say, for me he was much more than an installation manager.

His fellow workers and the customers, with whom he worked on installation and service projects, will remember the quality and efficiency of his work.

He was an example to us all of "a job well done".

Customers in Germany, Great Britain, Belgium, France, Italy, Japan, Korea, Taiwan, Brazil and other countries will remember José Carlos Sánchez's qualities.

We will always remember him and miss him, with affection and nostalgia...

JAUME LLEAL – Executive President

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