FILTRATION news
8
September 2004

The importance of filtration when machining in series

HOW TO EARN MONEY BY INCREASING *"QUALITY REPEATABILITY"* WITH THE INSTALLATION OF CENTRAL FILTRATION SYSTEMS?

When machining parts in medium and large series production runs there is one decisive factor which really establishes the yield of the production process, this factor is **"quality repeatability"**, an indication of how many times a part can be machined without any sensitive variation that affects the end quality of the machined product.

When **"quality repeatability"** is achieved over long production periods **" the process of earning money"** comes into effect by reducing machining times, increasing cutting speeds, advances and pass depth in an attempt to get the same results from the process in a shorter time.



Paper band central filtration system with hydraulic vacuum type TADE 26 DA 120 to filter 8.000 l/min of flow rate with 120 m³ of total capacity of emulsion for production lines for gear box components.

This brings about an increase of the **"quality repeatability"** as the physical and chemical state of the coolant fluid is always the same during the machining process.

Continued on following page.....

HOW TO INCREASE *"QUALITY REPEATABILITY"*?

The answer is simple:

Installing central filtration and cooling systems for emulsions and cutting oils.



Visit us
HALL 2 Stand B-146
Our engineers will answer your queries in person

from 19.10.04 to 23.10.04
BARCELONA

KENFILT
novotecnic



FTD 20 DA 10 pre-coat Central filtration unit for derivation filtering and cooling of cutting oil for a line of 20 multiple spindle lathes at a flow rate of 1,000 l/min to ensure that all the lathes work with clean transparent oil at the same temperature.

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Centralising the cooling fluid system has the following advantages:

- **All the machines work with a coolant in the same conditions regarding filtration quality, temperature, chemical composition, etc.**

  This means that any part may be processed in any other machine, without there being any finish or dimensional problems due to a difference in the degree of purity or temperature of the cooling fluid.

- **Improved degree of filtration**

  As central filtration systems are of larger installations they incorporate much more complex purification systems but with a lower cost/litre of filtrate than for individual units.

  The calculation of the amortisation of the investment should consider that the higher the flow rate of the Central filtration system, the lower the cost per litre of filtrate.

  It is therefore more economical to install complex central filtration systems than simple individual ones.

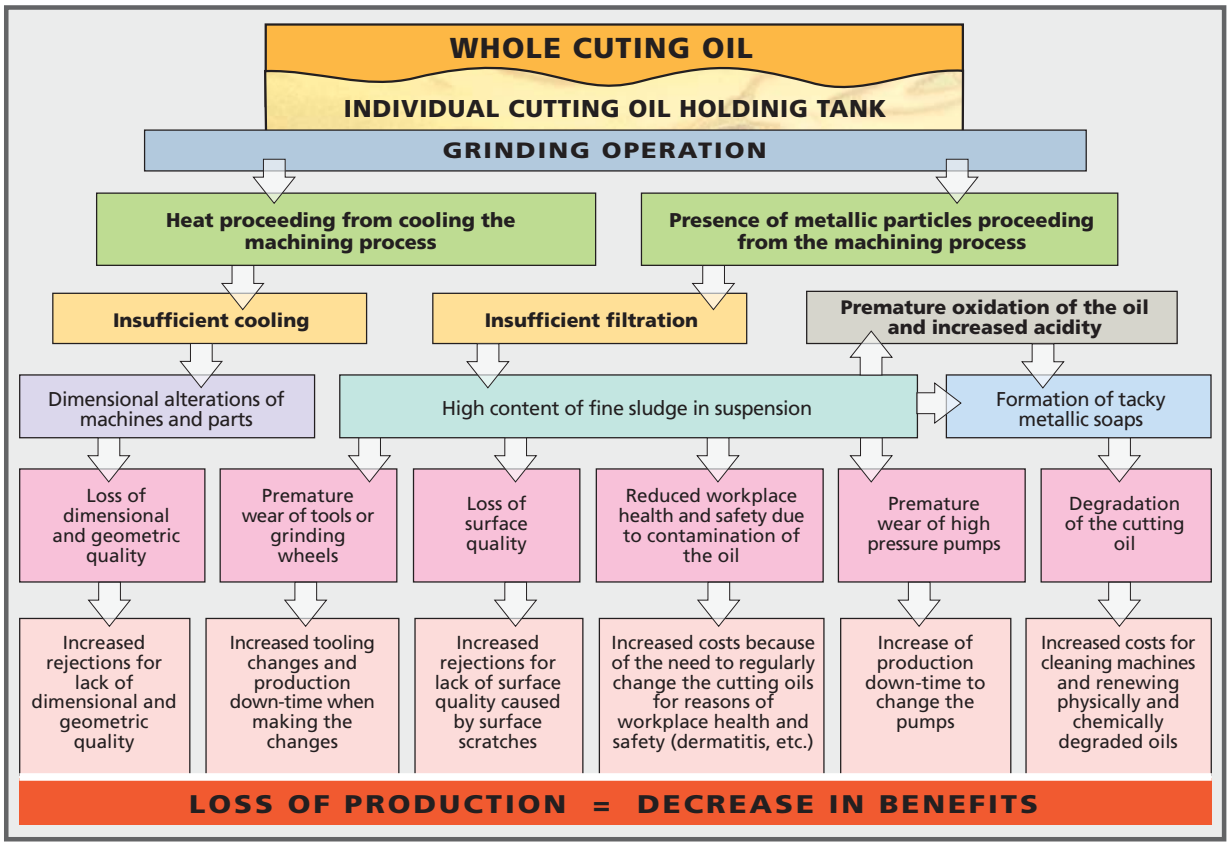
- **Improved temperature control**

  As central filtration systems are larger and more complex installations they can be fitted with more powerful cooling systems with a much lower cost per litre of filtrate cooled than individual units.

- **Improved control over the condition of the cooling fluid**

  As there is only one tank of coolant it is easier to perform regular controls of its condition. This control may even be carried out on a daily basis as it is only necessary to analyse one sample.

On the other hand, the installation of central filtration systems simplifies the possibility of contracting an effective maintenance or **"Fluid Care"** service from the coolant supplier. This then guarantees the state of purity and temperature of the



cooling fluid as well as its physical and chemical condition.

WHAT HAPPENS WHEN USING SIMPLE INDIVIDUAL TREATMENT INSTALLATIONS?

YOU SIMPLY WASTE MONEY!
In the majority of machine workshops each machine–tool has been supplied with the fluid cooling unit provided by the machine manufacturer. These units has special technical characteristics that are often different from the other machines in the line and therefore the physical and chemical condition of the cooling fluid varies from one machine to the other making it extremely difficult to obtain the same **"quality repeatability"** in all the machines as each is working under different conditions.

The diagram below shows the negative effects caused by the use of individual treatment installations for each machine.

It is important to stress that each rejected part causes a direct loss to the profits of the company equal to the sale price of the part.

DIRECT POSITIVE EFFECTS ON PRODUCTION OF A GOOD CENTRALISED FILTRATION SYSTEM

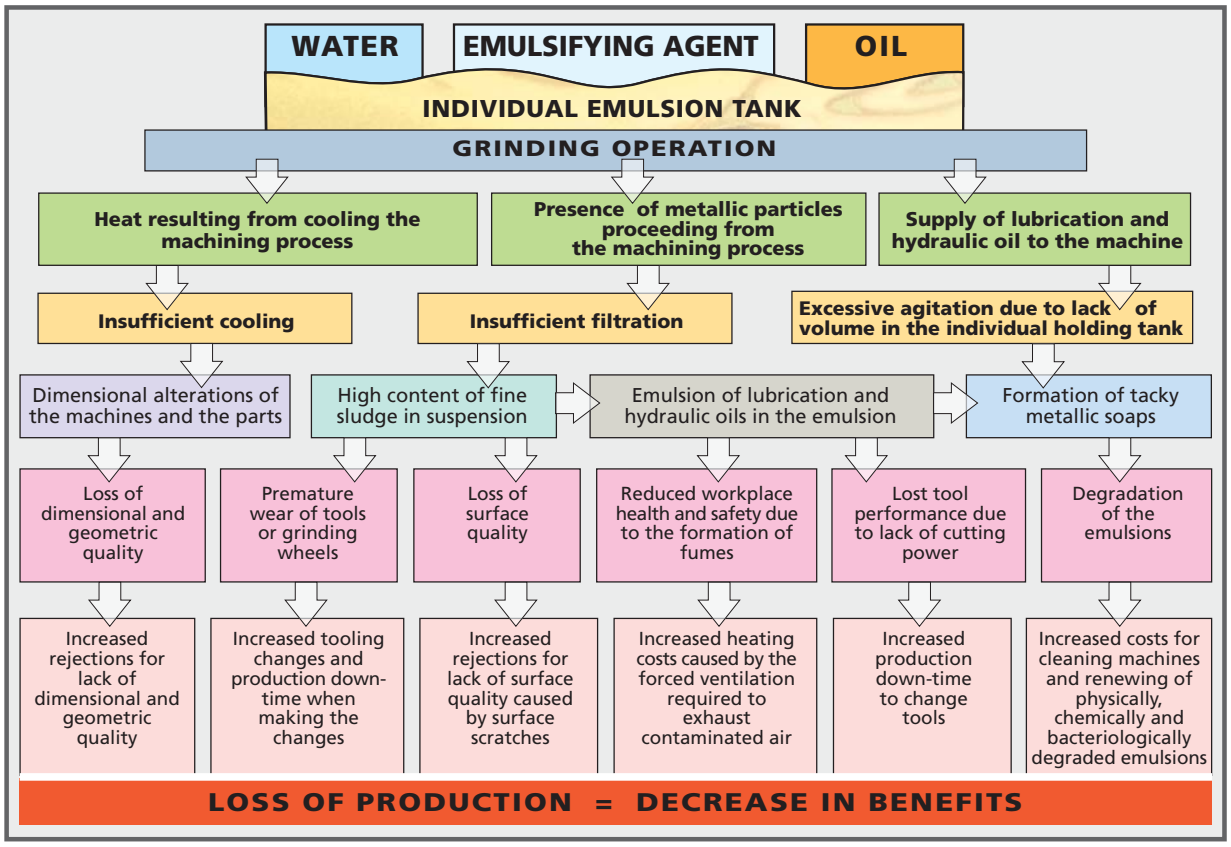
- Increased tool performance.
- Reduced costs of re-sharpening and purchasing tools.
- Reduced production down-time for tooling changes.
- Reduced number of rejected parts for problems with the surface or dimensional finish.
- Considerably lengthens the "life" of high pressure pumps for tools with internal cooling (gun drills, Mapal reamers, etc.) which in many cases may even be unlimited with good filtration.
- Reduced cost of maintenance of the filtration installation, as maintenance is limited to a single installation (cleaning, replacement, filtering medium, maintenance of pumps, valves, etc...).
- Reduced maintenance costs of the machines:

  Frequent cleaning of the part clamps or machined bars is not required.

  It is not necessary to regularly repair the feed shaft bearings, as damage is often caused by premature wear of the close seals.

  Is not necessary to repair the guides because of premature wear of the scrapers and close seals of the machine carriage guides.

All this results in an undoubtable increase of production with corresponding increase in company profits.



Circulating or submerged cooling systems

KENFILT-NOVOTECNIC designs and manufactures cooling units to suit customer requirements.

Control of the temperature of a liquid may be either by means of liquid-cold water heat exchanger (see Filtration News No. 5) or directly through an independent cooling unit.

In the latter case the two most common systems are:



A

SUBMERGED EVAPORATOR UNITS

The evaporator of these units is submerged in a tank that contains the liquid to be cooled.

KENFILT-Novotecnic supplies a coil (evaporator) custom made from steel alloy, stainless steel., copper, etc., pipe to suit each case.

ADVANTAGES	DISADVANTAGES
• No need to create a liquid circuit	• Increased volume of liquid to be cooled
• Easy to install	• Total height of the elevated unit
• Temperature control of the tank	• Maintenance of the submerged coil
• Longer fluctuations	• The coil is not commercially available on the market
• More regular operation	



B

UNITS WITH A RECIRCULATION PUMP

The liquid to be cooled is pumped through the evaporator of the cooling unit.

This system is the most common and is the same as normal water cooling units, but with the modifications required to adapt it to the liquid to be cooled (cutting oils, synthetic solutions, etc.).

ADVANTAGES	DISADVANTAGES
• All components of the installation are commercially available standards	• Creation of a secondary circuit (recirculation pump)
• Minimum volume of liquid to be cooled	• Sensitive to contamination of the liquid (installation of a safety filter)
• Smaller sized unit	
• May be installed anywhere	

SOLUTIONS KENFILT novotecnic

Country: **SPAIN**

Equipment/Central **FTD 20 DA 10**
Supplied 07.08.2003
NF-: 2137 / 3103

FILE Nº 2137

Manufacturer of: **THREADED PARTS OF CAR AND HOUSEHOLD APPLIANCE INDUSTRY**

Technical Data

Cooling Liquid:	**Cutting oil / 22 cSt at 40ºC**
Flow Rate:	**880 litres/min.**
Machined material:	**Steel, Brass and occasionally Aluminium**
Type of machining:	**Turning**
Number of lathes:	**16 multiple spindles**

Problem to resolve:

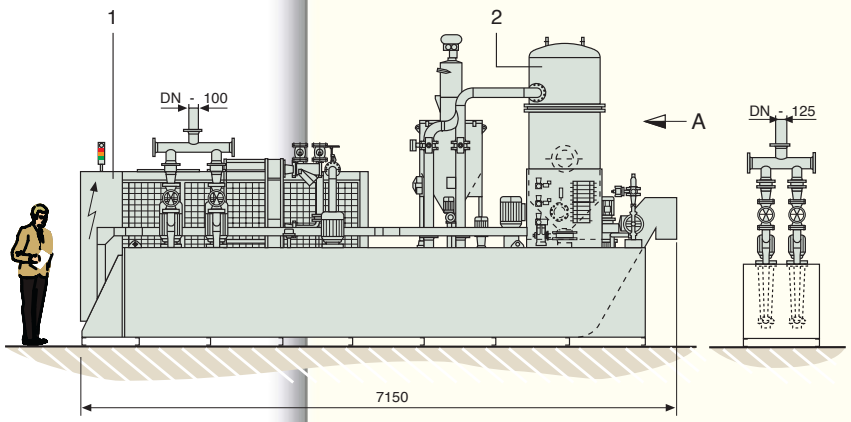
- Improve the quality of the turning
- Prolong the life of the coolant liquid
- Prolong the life of the tools

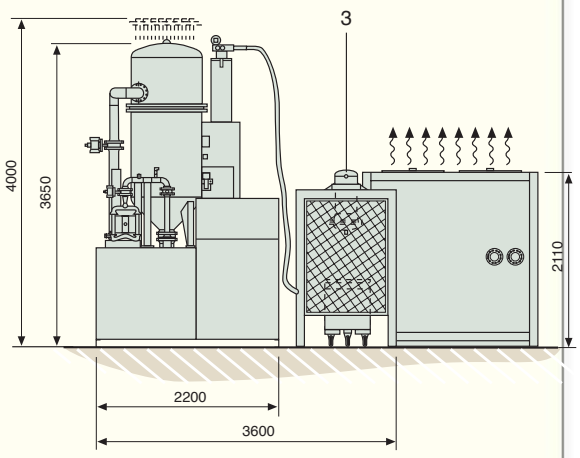
Adopted solution:

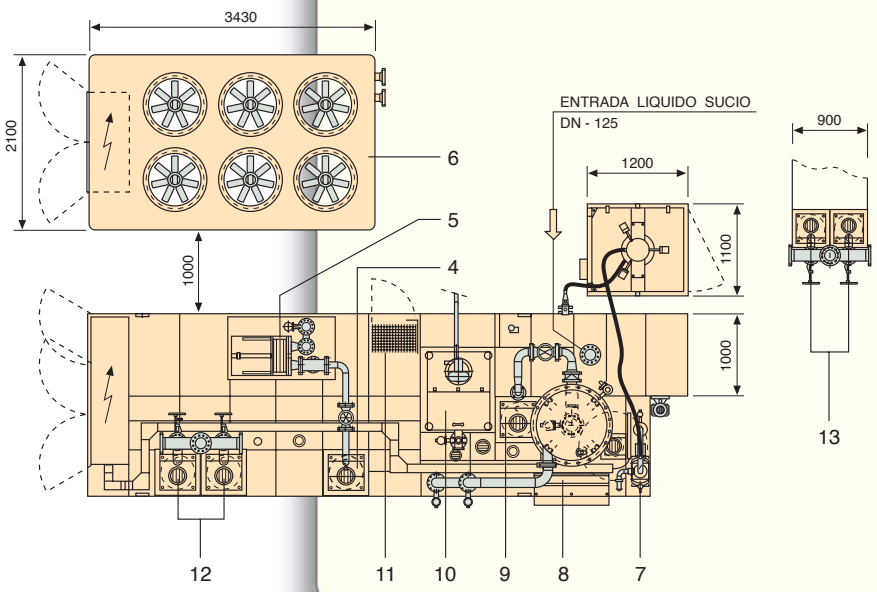
- **Installation of a Pre-Coat Central Filtration system, tofilter in derivation all the oil in use, with a rated filtration quality of 5 μm to obtain less than 15 mg/l of contaminants**

Obtained results:

- **Retention of contaminants in the cutting oil**
- **Reduction of rejected parts**
- **Increased repetitiveness quality of parts**
- **Maintenance of cutting oil quality in optimum conditions**
- **Decrease maintenance costs**







POS.	DESCRIPCIÓN
1	Armario eléctrico
2	Filtro FTD-20
3	Cámara secado de lodos
4	Bomba recirculación
5	Intercambiador de calor
6	Equipo de frío
7	Bomba secado de lodos
8	Panel neumático
9	Bomba filtración y recubrimiento
10	Dosificador filtro ayuda
11	Aspirador de nieblas
12	Bombas distribución
13	Bombas trasvase
	Capacidad total : ±10.500 l

Cutting oil central filtration system of gearboxes



View of the FTD 25 DA 20 cellulose type Central Precoat filtration system to filter the cutting oil for a gear grinding line at a flow rate of 900 l/min.



View of the electrical cabinet of one of the Central Filtration Systems FTD 25 DA 20 from the axle grinding lines.

FIAT – GM Powertrain has put its new lines for the manufacture of the latest generation 6-speed gearboxes into operation in its OPEL facility in Aspern/Vienna, Austria.

For the manufacture of these new gearboxes FIAT – GM Powertrain has installed the most modern, sophisticated machinery and suitable production and control technologies to ensure the construction of gearboxes with extraordinary reliability and the highest level of performance.

The shafts of this gearbox are machined on two lines each with 5 TACCHELLA grinders. They work with CBN grinding wheels and use cutting oil as the cooling fluid. The oil is filtered in two **KENFILT –Novotecnic** type FTD 25 DA 20 precoat central filtration systems.

The gears of these gearboxes, after being submitted to a heat treatment process that could cause small geometric deformations of the teeth of the gear wheels, are machined on THREE lines of high performance REISHAUER grinders that use cutting oil as the cooling fluid. This oil is then filtered by three **KENFILT - Novotecnic** precoat central filtration systems.

Two of the lines each include of 2 Mod. RZ-150 grinders.

The other line consists of 4 Mod. RZ-400 grinders.

The groups of grinding machines are linked to each other by automatic conveyor belts. This is why it is important that the oil has the same working temperature in all the machines.

for the manufacture

To ensure that neither the grinding machines, nor the machined parts suffer any deformation due to dilatation caused by temperature variations during the grinding process, the central cutting oil filtration process incorporates a cooling system that maintains the oil at a constant temperature of 22°C ± 1°C. This thermal stability ensures the highest possible quality and repeatability.

KENFILT - Novotecnic central filtration systems incorporate a sludge drying system that uses compressed air to recover the cutting oil that impregnates the sludge proceeding from the regular discharges of the pre-coat filters. This system enables discarding sludge with a very low content in cutting oil.

The 5 pre-coat central filtration systems supplied by **KENFILT – Novotecnic** use cellulose as a filter aid and enable maintaining the content of solids in suspension in the oil below 35 mg/litre, with a filtration quality rating in the order of 5 μm, equivalent to ISO 4406 CODI 19/16.

These machining operations and the quality of the filtration obtained in the **KENFILT-Novotecnic** pre-coat filters ensure the exceptional quality of the dimensional and geometric tolerance of the gear shafts and teeth, as well as the surface roughness.

This process achieves better sliding of the gears, improving the transfer of forces, and resulting in increased energy performance of the gearboxes. When combined with the six gears, this means a considerable reduction in fuel consumption, providing benefits to the user of the vehicle as well as the environment in general.

On the other hand, the geometric perfection of the profiles of the gear teeth ensures a noticeable reduction of noise and vibration in the gearboxes, increasing user comfort as the vehicle runs much more silently.



Front view of the FTD 25 DA 20 cellulose precoat central filtration system.

Our window

Increased participation in national and international trade fairs during 2003-2004.

Trade fairs already held:

EMO '03 - Milan

Last October we attended a new edition of the EMO fair, of great international renown in our industrial sector. We welcomed numerous visitors during the 8 days of the event including people from: Germany, Austria, Belgium, Brazil, Korea, China, Denmark, Spain, France, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Portugal, Sweden, Switzerland, the UK and the USA.

TOOLING '03 - Birmingham

The Tooling 2003 fair took place in the National Exhibition Centre in Birmingham, from November 11 to 13, 2003, and we participated as exhibitors with CUTAHARST LTD., our representative in the United Kingdom.

MACH '04 - Birmingham

Presentation of our units in the stand of our representative, CUTAHURST LTD. Technical support was provided during by a sales engineer from **KENFILT-Novotecnic**.

BIEMH '04 - Bilbao

Participation together with our representative in the Basque Country, IZEKA, S.L.



KENFILT-Novotecnic stand in the EMO in Milan 2003.

Upcoming Fairs:

BIMU '04 - Milan

Participation through our representative IPR MACCHINE, SRL. October1 to 6. Pavilion 15 Stand C 05.

MAQUITEC '04 - Barcelona

We will be in Pavilion 2 Stand B-146. October 19 to 23, 2004.

JIMTOF '04 - Tokyo

Tokyo November 1 to 8, we will be present in the event in the stand of our representatives, YKT Corporation. Stand E-6003.

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WE ARE ON THE WEB !

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