



Filtration of Coolants

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Function of Coolants

Liquid coolants are used in various grinding, honing and polishing processes in machine construction and in the metal, automotive and glass industry. They reduce the amount of heat produced and are designed to remove process residues from the treated area.

Coolant Quality Requirements

Reducing the impurities is important to keep the coolant flow clean and functioning optimally. Especially important is the reduction of particles in the fine grinding and polishing applications, such as processes with internal coolant supply.

Potential impurities in Coolants

- Metal and glass particles from the production and processing of the component parts
- Grinding residues, produced by grinding wheels or grinding strips
- Oil from coatings on component parts or machine leakages
- Fluff, dust and other impurities

Advantages of improved coolant quality

- Surface qualities of the product component parts which meet specifications
- No rework / no rejections / no measurement errors
- Low maintenance costs for the cooling system
- Limited production interruptions
- Low coolant costs
- Low labour costs
- Improved work environment
- No bad odours and improved visual appearance of the coolants
- Better protection of the operators
- Considerable improvement of the process reliability
- Shorter component parts processing times



High performance filter cartridges

3M high performance 740 Series High Capacity filter cartridges - the innovative filtration solution for high quality coolant

Applications

- Fine filtration within the central coolant supply to centrifuge / belt filter / deposition filter / vacuum drum filter, etc.
- Point-of-use filtration directly before the metal removing tool
- Use in separate filtration circuit



Advantages using the 3M high performance filter cartridges of the 740 Series

- Long filter service life because of the large filter surface and high dirt holding capacity
- High process reliability because of absolute grading and consistent filter quality
- Space-saving filter housing
- High coolant quality and therefore improved surface quality of the end product
- Excellent cost effectiveness

Reference example from a German automotive supplier

- Filter used: 3M 744B – 5 µm absolute
- Cartridge: Fine filtration of coolants in the central coolant supply to vacuum drum filter
- Central coolant flow supplies 5 UVA polishing processing centres
- Flow rate 9 m³/h; Medium Shell Macron 2205M7

Particle retention

According to ISO 4406:

Particle concentration (mg/l) ppm:

Reduction from 22/19/12 to 18/11/4

Reduction from 1.1 ppm to 0.020 ppm

Minimum particle size in coolant	Maximum particle size in coolant	Average particle size in coolant	Number of particles without using the 3M 744B	Number of particles using the 3M 744B
2 µm	2.4 µm	2.91 µm	4073	518
5 µm	5.9 µm	5.43 µm	1128	9
8 µm	9.3 µm	8.63 µm	273	0

Cost Effectiveness

Calculation cost effectiveness

Filtration in full-flow; circuit mode

Annual System Cost Calculation		
System data	Former system*	3M high performance 744B filter cartridge
Filter changes per year	52	6
Cost per filter	70 €	315 €
Filters per change	5	1
Cost per filter (hr.)	0.5	0.25
Labour costs (€/hour)	50	50
Filter costs	18,200 €	1,890 €
Labour costs	6,500 €	75 €
Annual total costs	24,700 €	1,965 €
Annual savings		22,735 €
Monthly savings		1,849.58 €

*Individual POU (point-of-use) Filter for each processing centre



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