



OVERVIEW OF SERVICES

Cooling Lubricant Systems Technology

Our 5 value propositions:

1. avoid „grinding burn“
2. increase productivity
3. reduce coolant consumption
4. comply with lubricoolant purity
5. coolant system monitoring / control

The cooling nozzle fabrication

- I. The audit result/ you fill in the grindaix questionnaire
- II. You supply a STEP file of the nozzle environment (collision) / interface machine
- III. We design an individually adapted coolant nozzle for you

What we pay attention to in the process:

- (interface, position, collision, installation space, ...)
- (supply geometry, distance, air cushion...)
- (**Geometry**, distance to the grinding point, pressure losses, Curvatures, radii, cross-sections, beam pattern, beam pressure, Air cushion penetration; beam expansion, beam deflection)
- (cycle-related pressure, volume flow, discharge velocity)
- 1 nozzle as many component types as possible (supply geometries)
- **Pressure requirement indication (recommendation) at the nozzle inlet**
- **Your nozzle characteristic**, coolant recirculation, coolant purity
- (**external wear protection - coatings, stabilisers, ...**)
- (**pressure sensor**, coolant monitoring)
- (pressure losses, pipe friction, flow simulation)
- (**easy assembly, quick-change systems,...**)
- (Nozzle test in the grindaix test stand, processing, material selection)

Project sequence: Machine optimisation

I. Choose one of your destinations:

- Avoid grinding burn
- Increase productivity
- Reduce coolant consumption
- Adhere to Lubricoolant purity
- Lubricoolant system monitoring / control

II. The Coolant Audit - on-site compliance audit

- Machine (actual/target consumption, collision, installation space, ...)
- Tool (condition, additives, service life, dressing tool...)
- Material (grinding burn tests - destructive / non-destructive)
- Pumps (suitability test, dimensioning, selection, ...)
- Nozzles (suitability test, position, coolant consumption, jet pattern)
- Valves (suitability test, dimensioning, selection)
- Lubricoolant lines (suitability test, dimension, cleaning, ...)
- Sensors, coolant monitoring (pressure, volume flow measurement, ...)
- Regulation (pressure, volume flow, discharge velocity)
- Lubricoolant purity requirements (residual dirt content, particle sizes)

III. The audit result (audit report)

- Statement on the fulfilment of objectives (from 1. Objectives)
- Technical conversion concept
- Construction drawings
- Parts list / Lubricoolant plan
- Offer (conversion / components)

IV. Your commissioning of our conversion recommendation

- V. Implementation / conversion
- VI. Commissioning / acceptance
- VII. Test Target fulfilment

The coolant nozzle

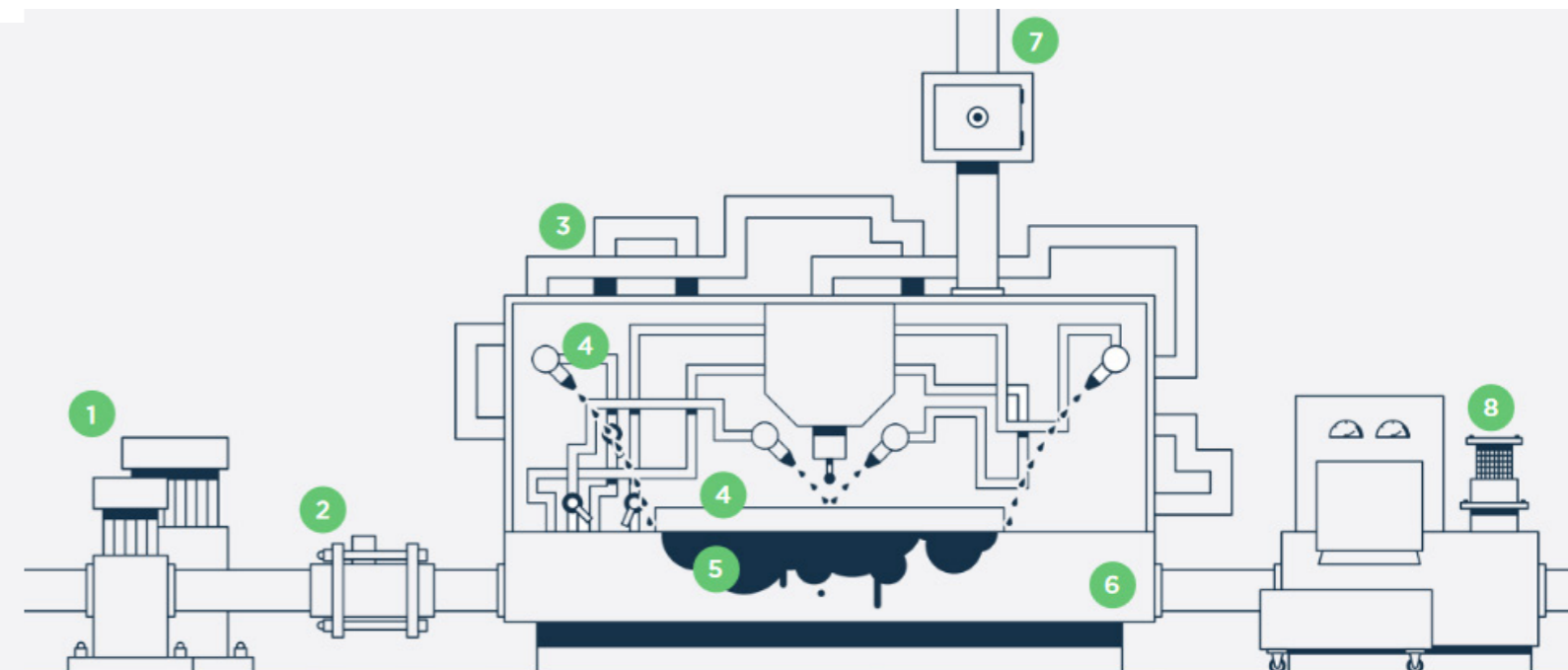
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The sole nozzle job only takes into account which in grey letters highlighted points

The Coolant Audit takes into account all listed points

The Coolant Audit

- 1 Pumps
- 2 Valves
- 3 Pipelines
- 4 Nozzles
- 5 Bed rinses
- 6 KSS return
- 7 KSS/Air - Extraction
- 8 Coolant filtration



Audit type	M1/2	M3	M4	M5
For users	✓	✓		
For machine manufacturers			✓	✓
Goals				
Avoid grinding burn	✓		✓	✓
Increase productivity	✓		✓	✓
Reduce coolant consumption	✓		✓	✓
Determination of the KSS requirement	✓	✓		
Increase energy efficiency	✓	✓	✓	✓
Complete KSS engineering				✓
Aftersales customer service with conversion			✓	
Service recipient - grinding burn			✓	
On-site analysis				
Pump technology	✓		✓	
KSS feed	✓		✓	
KSS system installations (valves, taps, pipes,...)	✓		✓	
Coolant consumption/ demand per grinding cycle	✓		✓	
Creation of a KSS consumption profile	✓	✓	✓	
Preparation of a KSS pressure and quantity supply plan for KSS individual and central supply		✓		✓
KSS requirements in different operating scenarios, e.g. all machines in use		✓		
Redesign of all coolant nozzles, design of coolant pressures according to requirements, Volume flows, supply lines and components, pump type and performance, taking into account the complete range of applications for your machine.				✓
Creation of a KSS and electricity consumption profile: Pumps (kWh) and coolant (pressure/quantity) per cycle				✓
Results				
Complete retooling engineering: (incl. drawings, technical data and product recommendations for an optimal coolant supply)	✓		✓	
KSS requirements plan for the ACTUAL state: preparation of an individual offer for a Grindaix conversion package (nozzles, pumps, optimised settings)	✓		✓	
Complete concept and design of the TARGET KSS situation incl. parts list; design drawings, detailed quotations				✓
Advantages				
Longer tool life	✓		✓	✓
Higher delivery/advance	✓		✓	✓
Grinding fire prevention	✓		✓	✓
Reduction of cooling lubricant and energy consumption	✓		✓	✓
Reduction of the filtration load	✓		✓	✓
Determination of cooling lubricant pressures and volume flows in line with requirements		✓		✓
Acquisition of dimensional variables for coolant components and filtrations		✓		✓
Customised optimised coolant supply				✓

Project sequence: Optimization filtration

I. Choose one of your destinations:

- Performance test existing single filtration <= 3 machines
- Performance test existing central filtration > 3 machines
- New procurement of single filtration
- New procurement of central filtration
- Your Lubricoolant purity: ACTUAL TARGET

NAS (oil) _____ _____
 DIN 4406 (emulsion): _____ _____
 Residual dirt content: _____ _____ (mg/l)

II. The Coolant Audit - on-site compliance audit

- Machines supplied (consumption actual, site planning, consumption target, ...)
- Evaluation of the reusability of existing filter systems
- Dirt load (in kg/h; chip types, tool abrasion, ...)
- cooling of cooling lubricants (heat exchanger, cooling medium/principle, ...)
- Pumps (line distance, dimensioning, selection, ...)
- Filter principles (suitability test, dimensioning, selection)
- Filter material (suitability test, consumption, operating costs, ...)
- Lubricoolant lines (dimension, bad point control, cleaning, ...)
- Sensor technology, Lubricoolant monitoring (pressure, volume flow measurement, ...)
- Robust processes: Control (constant pressure, volume flow control)
- Installation space / dimension filtration (dirt tank, clean tank, suction, ...)
- Operating aggregates: chip shredder, grinding sludge presses, ...
- Operating cost comparison fluid management (Lubricoolant costs / year)
- Environmental requirements (WHG / accident prevention, installation site, emissions, ...)

III. The audit result (audit report)

- Complete description of all customer requirements
- Selection of a suitable (additional) filtration process
- Examination of a plant dimensioning in line with requirements
- Preparation of a specification sheet / a rebuild recommendation
- Determination of different possible suppliers
- Accompaniment of the offer preparation (dialogue with suppliers)
- Comparison of offers (benchmark) according to up to 200 criteria
- Management summary for the customer's investment decision
- Preparation of a cleanliness specification / cleanliness test method

IV. Commissioning of the conversion recommendation

V. Implementation / conversion

VI. Accompaniment of commissioning / acceptance

VII. Inspection of target fulfillment (Lubricoolant purity)

Audit type	F1	F2	F3	F4
For existing installations	✓	✓		
For new acquisitions			✓	✓
Goals				
Performance verification for decentralised filtration	✓		✓	
< 3 machines				
Performance test for central cooling lubricant systems > 3 machines		✓		✓
Selection/assessment of an optimal coolant filtration system for the customer			✓	✓
On-site analysis				
Find existing problems due to MWF contamination	✓	✓	✓	✓
KSS uniform classes and requirements	✓	✓	✓	✓
Required filtration capacity (dirt load/quantity of coolant)	✓	✓	✓	✓
Analysis of the performance of the existing coolant filtration plant	✓	✓		
Results				
Creation of specifications			✓	✓
Technical catalogue of measures	✓	✓		
Conversion planning (engineering concept)	✓	✓		
Evaluation of different alternative solutions	✓	✓	✓	✓
Parts list	✓	✓		
Request for proposal			✓	✓
Offer overview including evaluation in technical and financial terms			✓	✓
Advantages				
Rapid information procurement	✓	✓	✓	✓
Product neutral support	✓	✓	✓	✓
Transparency	✓	✓	✓	✓
Cost-optimised solution development	✓	✓	✓	✓
Clean comparability from a technical, financial and organisational perspective			✓	✓

1. what does grindaix do?

- Complete cooling lubricant system analysis incl. conversion and commissioning

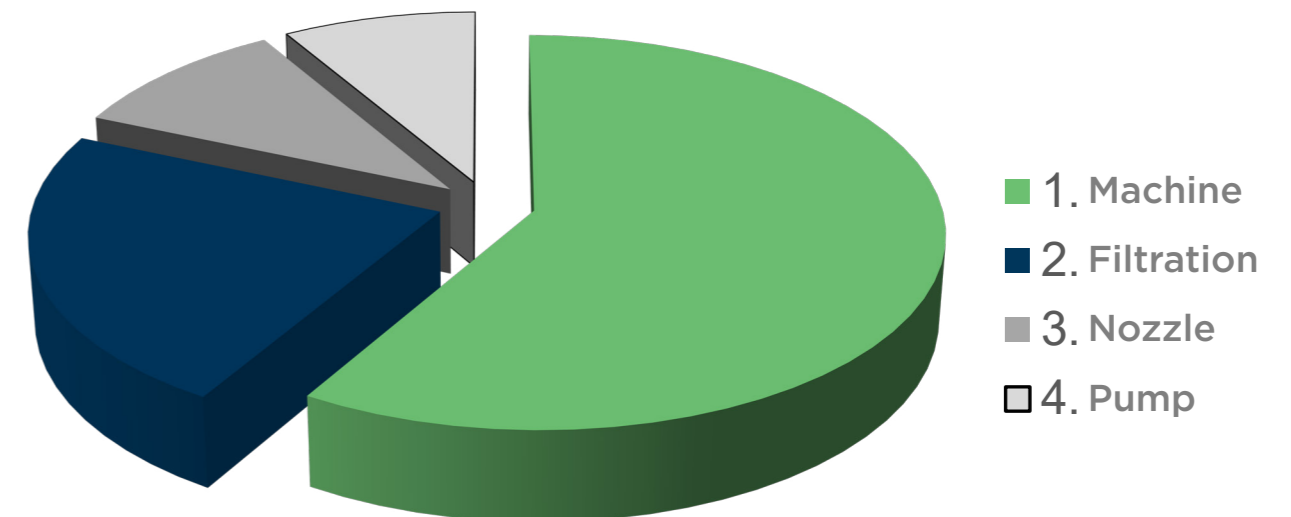
2. why grindaix?

- One contact for all your cooling lubricant supply questions
- professional, reliable, fast and flexible

3. What can grindaix do?

- Comprehensive coolant system optimisation taking into account all influencing variables in the coolant system
- Grinding burn test
- Nozzle design
- Pump dimensioning, selection
- Testing, cleaning, dimensioning of coolant piping systems
- Design / benchmarking of coolant filtration systems
- Integration of a coolant monitoring system

Your lubricoolant optimisation potential - harnessed by Grindaix!



Tackle the WHOLE and achieve MORE!



Your professional partner
around all coolant system questions

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