



Improving quality, reducing costs
rhenus **SPECIAL COOLANTS**
for efficient composite machining

Safer process.
Safer profit.



Composite machining with **rhenus** special coolants — up to **60% higher** feed rate and **four times more** parts produced

State-of-the-art machining processes rely on efficient machining of composite materials. Analyses show that conventional machining processes, such as dry machining or minimal-quantity lubrication, often deliver sub-optimal quality. By contrast, the use of special coolants demonstrates significant advantages in the process, meaning it is often the superior alternative.

Improve machining quality, reduce cost of waste

The machined workpieces made from composite materials are associated with a high degree of added value. As such, poor quality components and a high level of tool wear often generate very high costs. This makes these advanced materials less competitive.

What's more, dry machining in particular generates large amounts of fine dust, which is associated with significant health risks. The process of removing this fine dust from the machining centres involves the use of highly complex extraction and filter systems. These costs can be avoided by using coolant.

Using special coolants has a direct and positive impact on the quality of the cuts and drillings, the cost per hole, the process costs and costs of waste, as well as other key process figures.

Composite machining with rhenus special coolants

Materials for machining

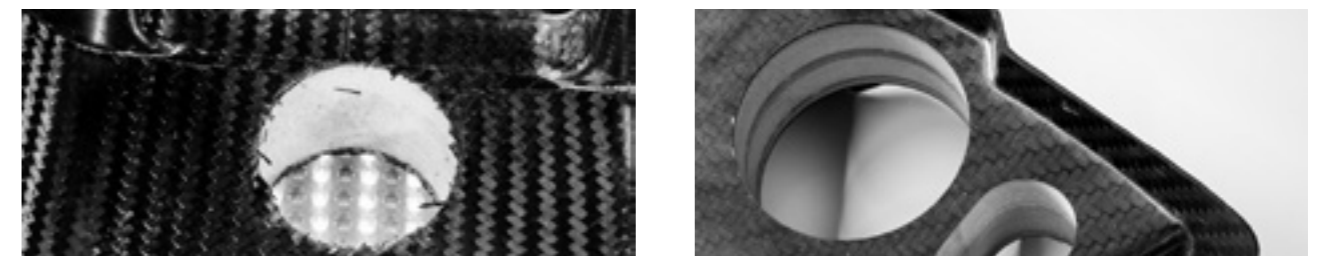
- Carbon fibre reinforced polymers (CFRP)
- Glass fibre reinforced polymers (GFRP)
- Combined lightweight construction materials/stacks

Process-related benefits

- Scope to use existing machinery
- Possible to retain existing processes for wet machining
- Possible to use existing tools
- Scope to contribute to fail-safe strategies when machining sensitive components

Quality and cost benefits in the machining process

- Reduced tool wear minimises tool costs
- Higher feed rate results in increased cutting speeds and therefore shorter production times
- Special rinsing effect keeps the machine room cleaner
- Less rework necessary as delamination is avoided
- Increased component quality
- Improved health and safety and working environment during use whilst maintaining compatibility with specific aerospace alloys



Machining processes compared: dry (left), rhenus special coolant (right)

rhenus special coolants for the composite machining process

- rhenus XY 190 FC
- rhenus XT 46 FC

Practical results

Tool	Cutting data without coolant	Cutting data with coolant	Without coolant	With coolant
Solid carbide milling cutter, pyramid profile, Ø6	8500 rpm 1200 mm/min	13500 rpm 2000 mm/min	6 parts = 42 m	40 parts = 150 m
Solid carbide milling cutter, Ø 4.8	7600 rpm 700 mm/min	7600 rpm 700 mm/min	6 parts = 1.7 m	40 parts = 6.8 m

Up to 60% higher feed rate and four times more parts produced

Absorbs fine dust, improves health and safety

When it comes to the essential issue of health and safety in the workplace, the benefits of this machining process are obvious:

- Optimal dust formation during machining
- Prevent potentially carcinogenic dry dust from forming in the workplace
- Maximum acceptance among process owners and machine operators



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