

Safer process.
Safer profit.



rhenus AIRCRAFT SAFETY OF THE HIGHEST STANDARD

Metal working fluids for the aviation industry

**rhenus
aircraft**
technology

Quality lubricants from **Rhenus Lub** for your process safety

The combination of tradition and innovation is deeply ingrained in the DNA of lubricant specialist Rhenus Lub. With a high level of expertise, the company develops and produces high-performance products for a wide range of industrial applications and sectors and understands the fluid management of its customers as

an experienced process expert. This makes rhenus one of the world's top brands for special lubricants.



Driven by innovation, Rhenus Lub succeeds in producing lubricants that not only meet the requirements of our time but also guarantee economic and ecological added value over the long term.

Rhenus Lub is unique in that it stands for a holistic approach to lubricant usage and plays a decisive role in successfully prolonging service life and reducing process costs. Rhenus Lub is therefore an indispensable

premium partner to industry – highly innovative, always reliable and with in-depth expertise in metal working fluids, industrial greases and fluid management.



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With safety of the highest standard – solutions for aviation

Those who have approval from renowned companies in the aviation industry need to reach new heights in terms of safety, performance and cost-effectiveness.

The special products from Rhenus Lub are used in internationally active companies in the aviation industry.

Weight-reducing and high-strength materials such as titanium and nickel-based alloys are extremely difficult to machine, result in high tool wear and longer processing times. Even under these complex conditions, special lubricants from Rhenus Lub meet the requirements placed on material compatibility.

- Machining of structural, fuselage and wing components as well as engine parts
- Innovative materials including titanium, nickel-based alloys
- Approvals from companies such as AIRBUS, Rolls-Royce, MTU, SNECMA, Messier Dowty, Embraer
- Airbus Industries Material Specification, (metal working fluids pursuant to AIPS 00-00-010, AIMS 12-10-001 requirements)
- Optimal machining performance



Long-term partnership with leading manufacturers in the aviation industry

ACITURRI • Airbus • Alenia Aermacchi • Biersack • Bombardier

Cesa • EADS • Embraer • GAZC • LEONARDO • Leuka

Liebherr • MTU • Ohnhäuser • PFW • PMG • Pratt & Whitney

PRAE-AERO • Premium Aerotec • Rolls-Royce • Safran • Serta

Sikorsky / Lockheed Martin • Spitzl • TEI • Telair • Toolcraft



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rhenus metal working fluids

Manufacturing aircraft components more efficiently

Our high-performance metal working fluids meet the latest requirements of the aviation industry. They provide the best results in terms of machining and long-term stability, with

extremely high cost-effectiveness.

As a customer of Rhenus Lub, you can put your trust in us, knowing that all fluid parameters are fulfilled in a stable and safe way to consistently high quality standards.

Fuselage

Turning, drilling, milling, grinding

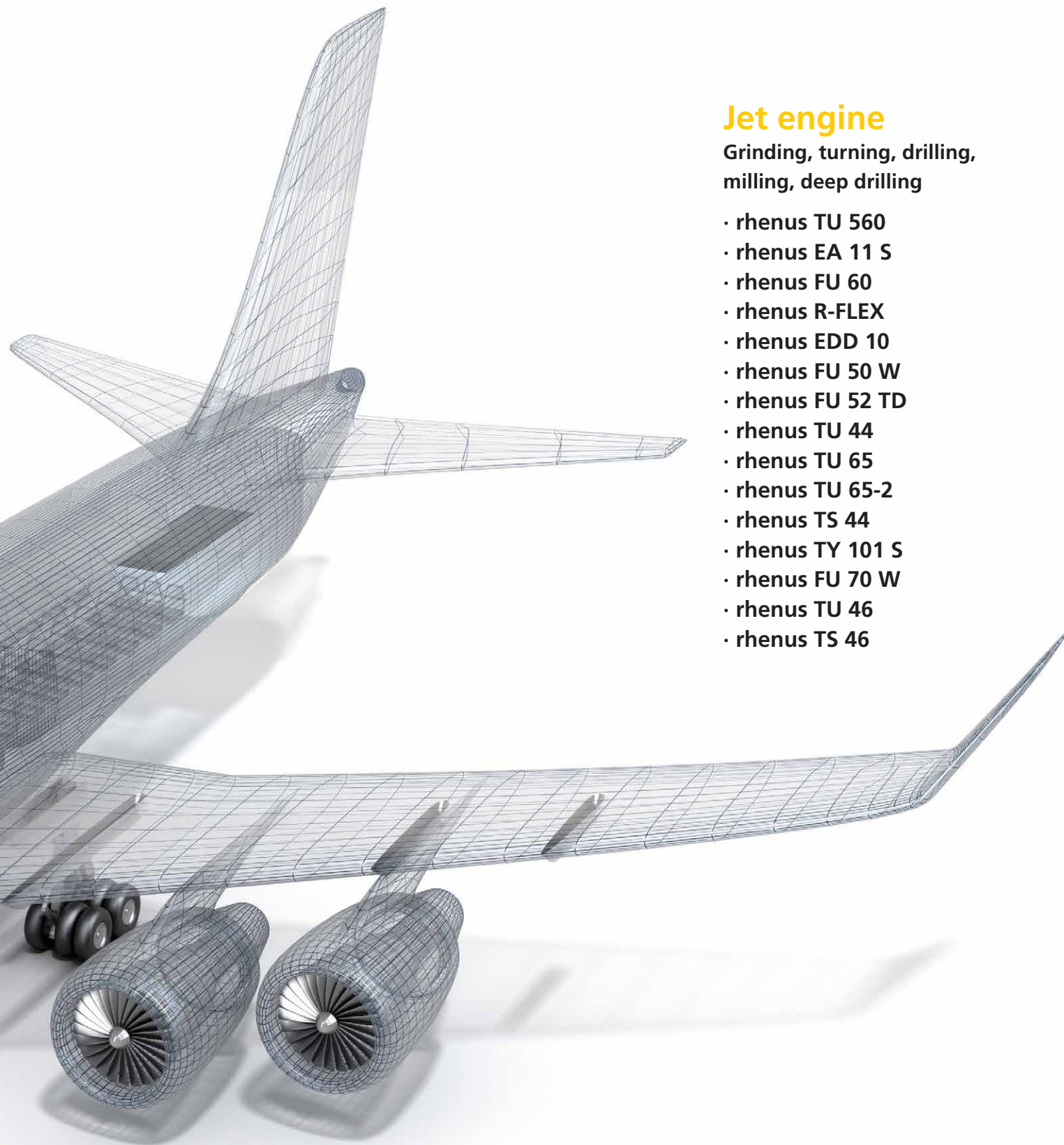
- rhenus TU 560
- rhenus EA 11 S
- rhenus FU 60
- rhenus EA 12 S
- rhenus TU 43 P
- rhenus TY 101 S
- rhenus TU 65
- rhenus TU 65-2
- rhenus CBR

Ribs, structural components

Turning, drilling, milling

- rhenus TU 560
- rhenus TU 43 P
- rhenus FU 70 W
- rhenus TU 65
- rhenus TU 65-2





Jet engine

Grinding, turning, drilling,
milling, deep drilling

- rhenus TU 560
- rhenus EA 11 S
- rhenus FU 60
- rhenus R-FLEX
- rhenus EDD 10
- rhenus FU 50 W
- rhenus FU 52 TD
- rhenus TU 44
- rhenus TU 65
- rhenus TU 65-2
- rhenus TS 44
- rhenus TY 101 S
- rhenus FU 70 W
- rhenus TU 46
- rhenus TS 46

Landing gear parts

Turning, drilling, milling

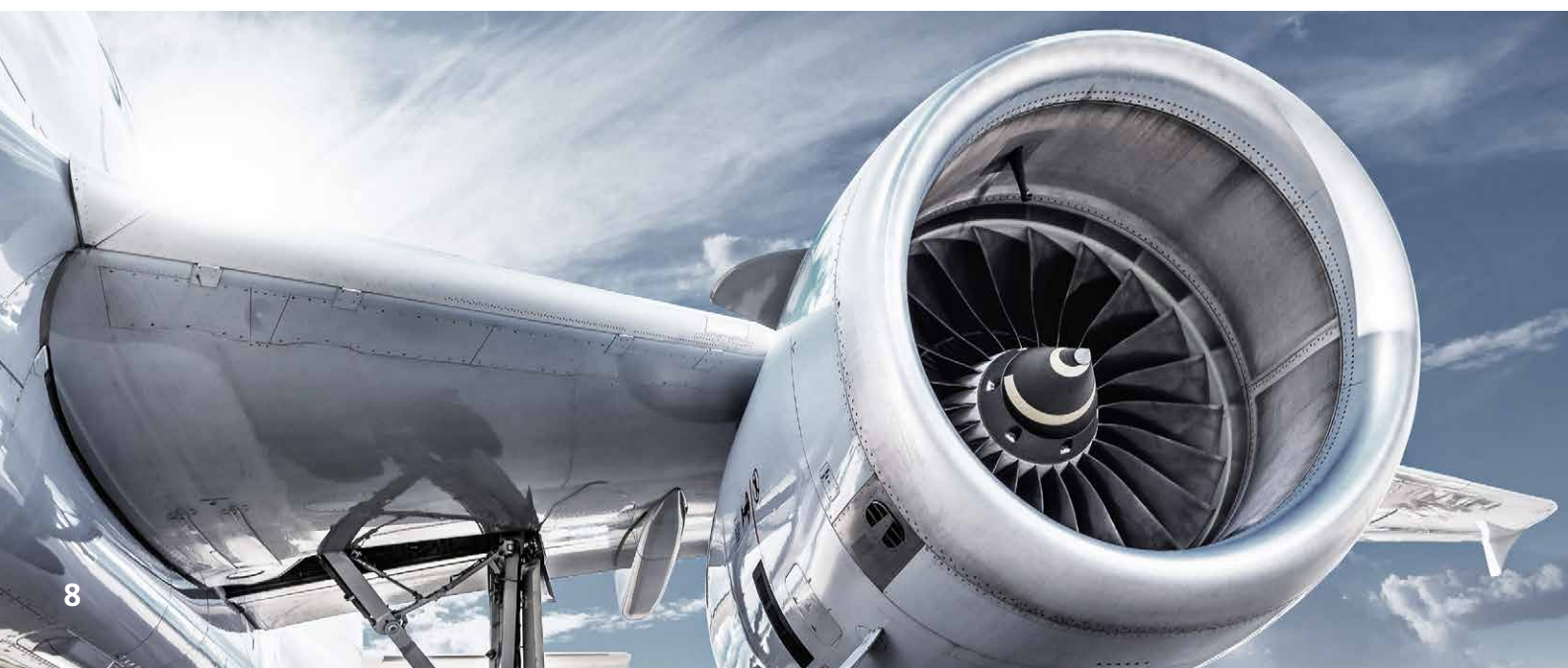
- rhenus TU 560
- rhenus EP 11 M
- rhenus EA 12 S
- rhenus FU 60
- rhenus FU 70 W

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rhenus core products at a glance

Jet engine		Fuselage	
Products (geometrically defined cutting edge)	rhenus FU 60	Products (geometrically defined cutting edge)	rhenus FU 60
	rhenus TU 560		rhenus TU 560
	rhenus TU 43 P		rhenus TU 43 P
	rhenus EA 11 S		
Products (geometrically undefined cutting edge)	rhenus TY 101 S	Typical components/ machining options	Frames, loading systems
	rhenus R-FLEX		Seat rails
Typical components/ machining options	Turbine blade		Cross beams
	Blisk		U-profile for flap track, seat rails
	Compressor wheel		
	Blades		
	Housing		
Materials	Aluminium	Materials	Aluminium
	Nickel-based alloys		Titanium (e.g. Ti6Al4V)
	Titanium (e.g. Ti6Al4V)		
	Nickel-based superalloy (e.g. Waspaloy)		
	Hard metal		



Landing gear	
Products (geometrically defined cutting edge)	rhenus EP 11 M
	rhenus EA 12 S
	rhenus FU 60
	rhenus TU 43 P
	rhenus TS 44
Typical components/ machining options	Structural landing gear parts
	Suspensions
Materials	Titanium (e.g. Ti6Al4V)
	Aluminium Steel Chromium

Wing	
Products (geometrically defined cutting edge)	rhenus FU 60
	rhenus TU 560
	rhenus TU 43 P
Typical components/ machining options	Wing ribs
	Hinges
	Landing flaps
	Mounting for vertical stabiliser
	Reinforcement ribs
Materials	Aluminium
	Titanium (e.g. Ti6Al4V)



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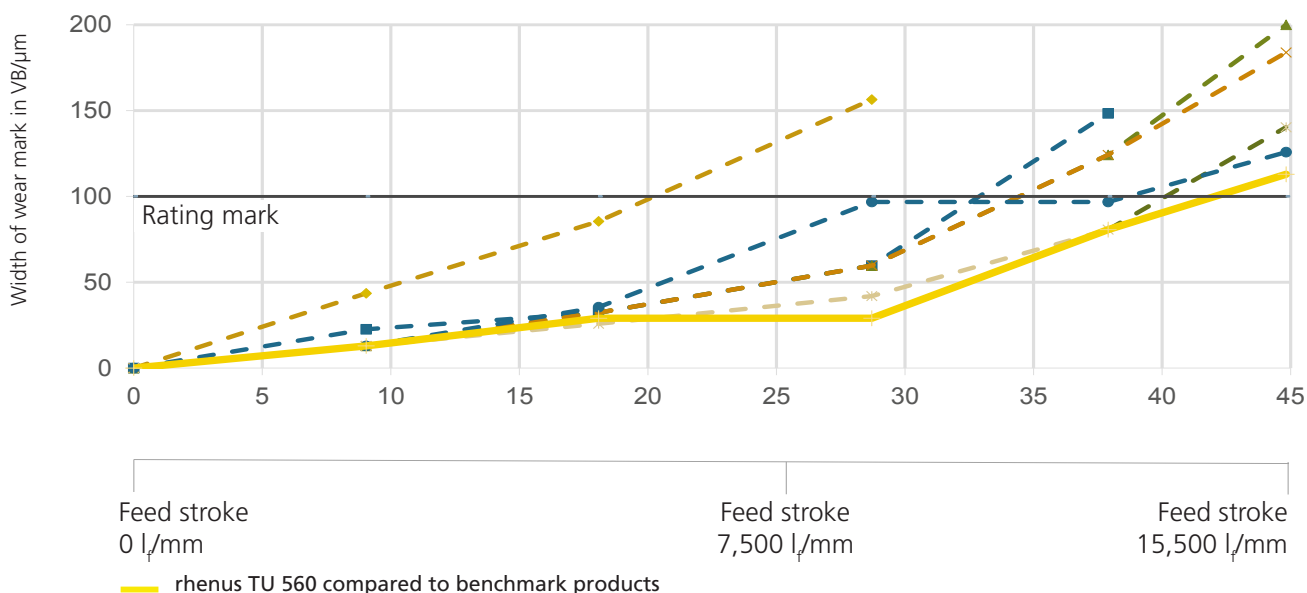
rhenus TU 560

The high-performance premium product

A metal working fluid should have particularly effective lubricating properties for the machining of nickel-based alloys (such as Inconel or Waspaloy). In addition, titanium machining calls for a high-performance combination of cooling and lubrication – rhenus TU 560 is particularly recommended for this.

Wear test VB (end milling, TiAl6V4)

Extremely long tool life in titanium machining.



Key properties

- Produces little foam during use
- Tested for PU compatibility
- Tested for material compatibility in accordance with AIMS 12-01-001

Environment and occupational safety

- No SVHC ingredients
- No GHS pictograms
- Good skin compatibility
- WGK 1 (water hazard class)

Efficient composite machining with special coolants

Precision and high tech, stability and weight reduction: the demands placed on components for the aviation industry are constantly growing. They are accompanied by high performance requirements in the production of parts – for materials such as aluminium, titan and composites, as well as for machines and tools in machining processes. We stand for better component quality, while simultaneously reducing tool costs, with coolants specially developed and approved for the machining of aviation components.

Overcome the challenges of efficient composite machining

The new special coolants from Rhenus Lub represents a significant upgrade over conventional dry machining processes. Improve the tool life and the quality of your workpieces.



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

Your advantages at a glance:

- Significantly reduced tool costs thanks to low tool wear
- Increased productivity due to adapted cutting data
- Increased component quality
- Avoids delamination, less post-processing required
- Special rinsing effect keeps machine rooms clean
- Tested for material compatibility, no interference with the raw material

With our **rhenus XY 190 FC** and **rhenus XT 46 FC** special coolants, you can now machine fibre-reinforced polymers such as CFRP or GFRP as well as stacks with your existing equipment and tools efficiently and easily.

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