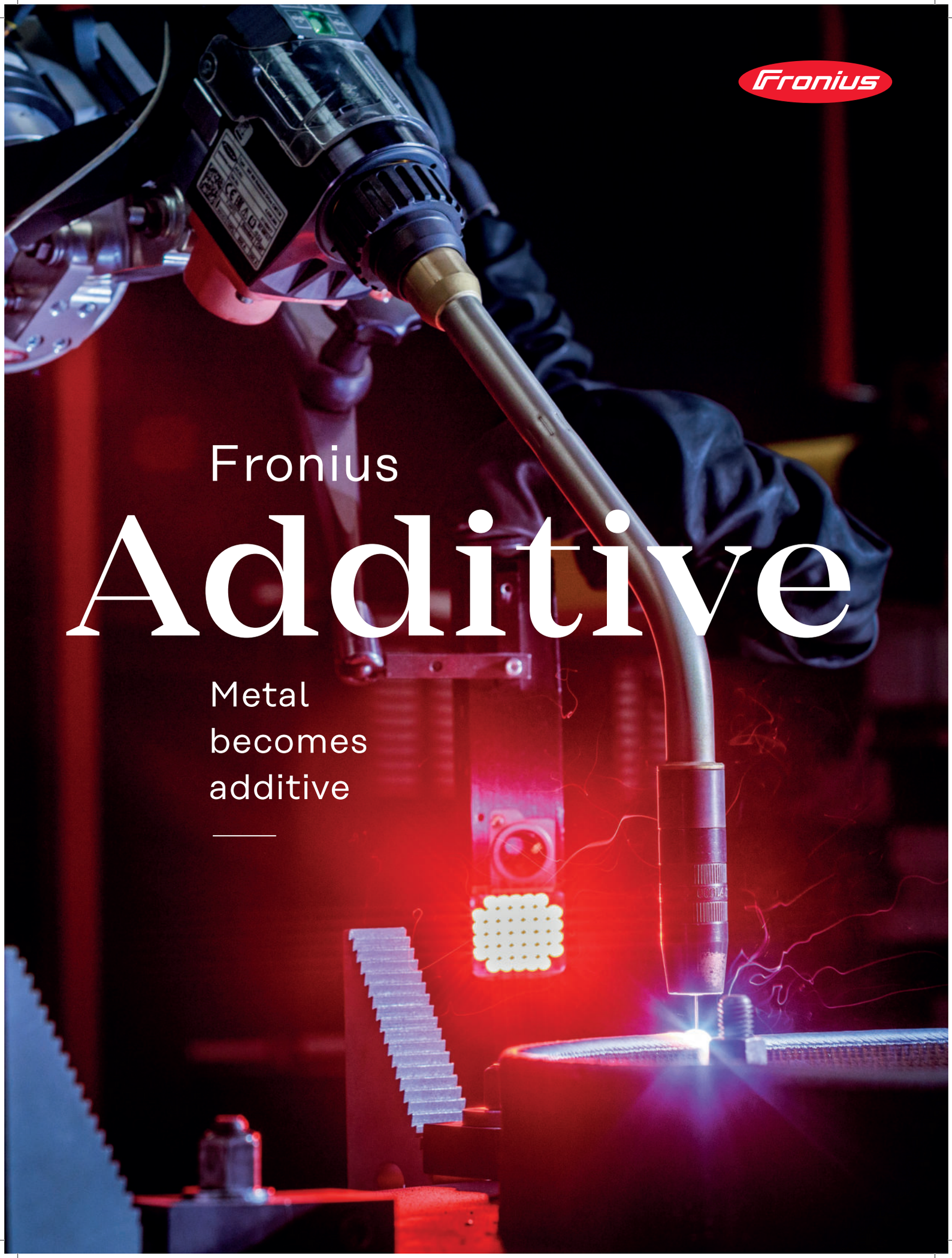

Fronius
Fronius
Additive
Metal
becomes
additive

Layer by layer

A layered build-up creates components seemingly out of thin air.

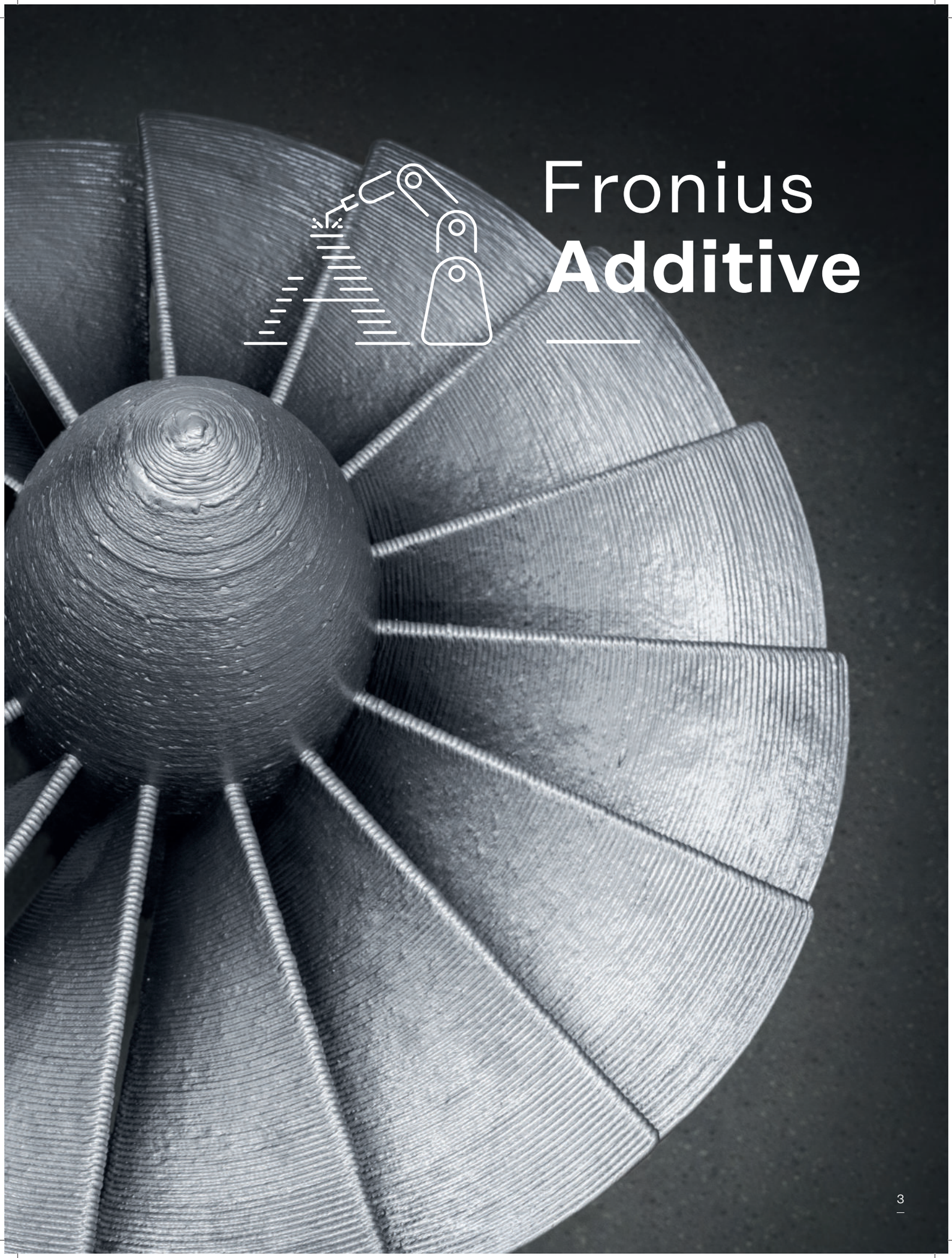
Individual design freedom and technical precision come together to transform weldable materials into tailor-made components.

In contrast to conventional subtractive processes that remove material—such as milling or cutting—additive manufacturing adds material to produce the desired component.

The future of additive manufacturing: Push the boundaries of what's possible.

Fronius Additive is revolutionizing the manufacturing industry with this fast, cost-effective, and precise method for producing components.

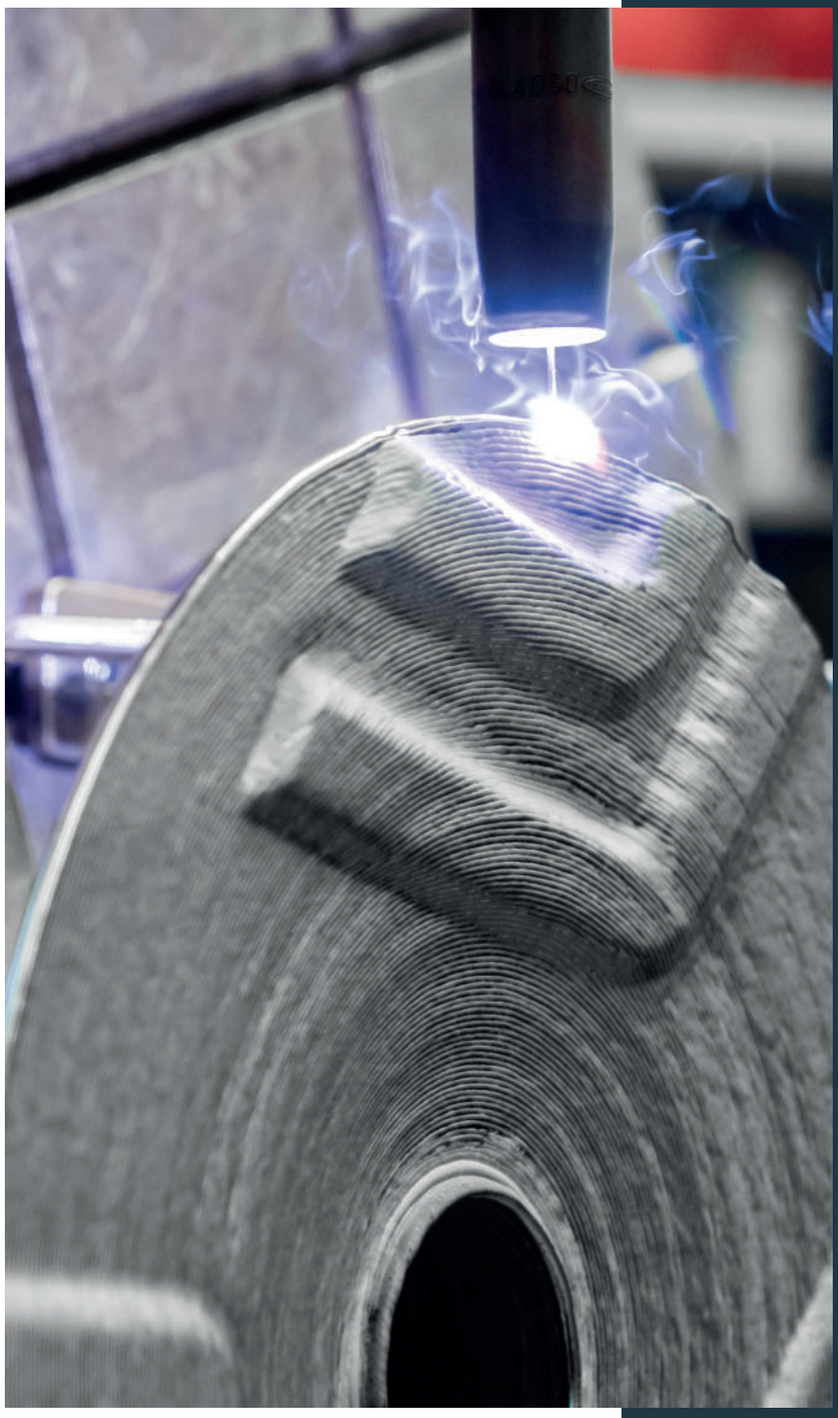
The wire-based and arc-based CMT process permits complex geometries and a high degree of flexibility in component design while delivering high deposition rates, all of which make this process ideal for prototype construction and small batches.



Fronius **Additive**

CMT Additive Pro

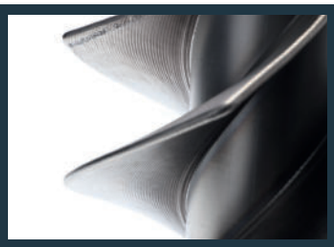
For maximum additive control

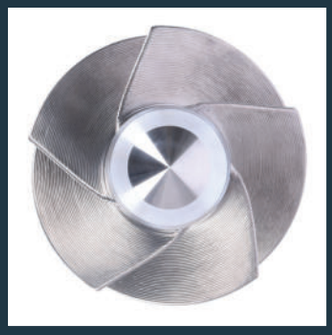


Efficiency and process stability

The synergy between stability and flexibility is crucial to producing components in additive manufacturing—and a reliable welding process and efficient heat management are key.

Thanks to its revolutionary reversing wire movement, the CMT process is extremely stable, making it a perfect solution for additive manufacturing. Layers are built up consistently, evenly, and virtually spatter-free, ensuring that the welded layers and components produced meet the highest standards of quality.





Exclusive features

for additive manufacturing

We developed the CMT Additive Pro welding characteristics specifically for additive manufacturing.
They make it easy to achieve a reproducible uniform layer structure, as well as deal with other challenges.

For the first time, you can also get positioning feedback during welding without any external sensors.

All in a single characteristic

Deposition rate stabilizer

The deposition rate is regulated by the welding process. Layers are built up more consistently while boosting the reproducibility of production.

Pulsed HotStart

It's simple to start welding in pulsed arc, so you can achieve sufficient penetration and adhesion even without adjusting the operating point.

CTWD measurement

The CTWD value [mm] is measured in real time and was specially developed for materials with low electrical conductivity, such as steel.

Power correction

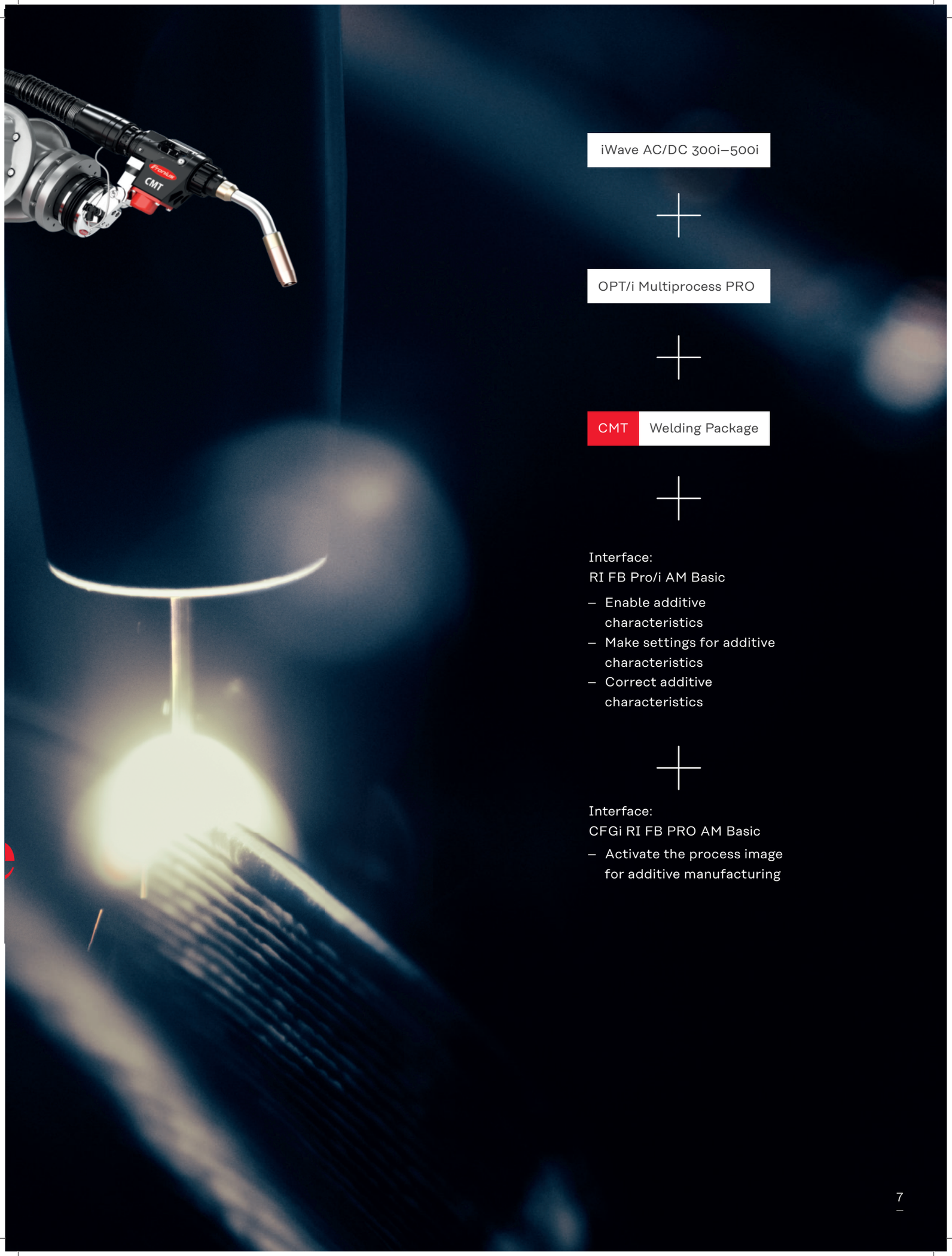
Heat input can be precisely regulated thanks to the power correction, so you can keep the seam geometry almost constant, even at elevated temperatures.

Equipped for the challenges

of tomorrow

Your complete solution for today, tomorrow, and beyond

Our perfectly coordinated equipment for additive manufacturing is compatible with conventional robot systems and includes the following Fronius components.



iWave AC/DC 300i–500i

+

OPT/i Multiprocess PRO

+

CMT Welding Package

+

Interface:
RI FB Pro/i AM Basic

– Enable additive characteristics
– Make settings for additive characteristics
– Correct additive characteristics

+

Interface:
CFGi RI FB PRO AM Basic

– Activate the process image for additive manufacturing

Fronius Additive Cell

Plug-and-play ecosystem

The Fronius Additive Cell is our turnkey system for immediate use. From the robot mechanics and software to a thermally optimized clamping system, we offer you a validated, all-in-one system from a single source—designed to seamlessly integrate into your manufacturing process.

Complex processes, effortles-scontrol.

Includes:

Vectris

software bundle

The Vectris software bundle, combining the Machine Tool Service Kit and a postprocessor, has been shaped by Fronius's longstanding expertise. It sets the stage for simple and stable additive welding applications with high process reliability and no time-consuming programming.

Machine Tool Service Kit

Integrated kinematic model

Reachability checks, collision checks, and optimized motion sequences for the eight-axis robotic kinematics with welding torch.

Adapted user interface

Clear, pared-down interface with a unique set of Fronius features. Faster to use thanks to streamlined tools and integration with the Polaris system controls.

Operations

Predefined, tested welding operations for additive manufacturing processes—reliable and ready to go.

Build styles

Geometry-based detection of different component regions (such as exterior walls and fillings) or specific characteristics (such as overhangs or component joints) offers flexibility when inputting process parameters.

Postprocessor

Converts the toolpath directly into ABB RAPID robot code. Developed here at Fronius, the integrated "FroArc" welding command takes the complexity out of the robot code while also increasing functionality, making it ideal for additive welding applications.

Prototyping
and small series
Solutions that impress

360°- service

From the feasibility study to the pilot series

Our comprehensive service package gives you everything you need to optimize and carry out your additive manufacturing processes. We offer custom solutions to meet your individual requirements.

Our experts work closely with you, from the initial consultation and feasibility check to the development and production of your component. By taking this approach, we help you manufacture your first prototypes and preproduction series and ensure you get off to a smooth start with the additive manufacturing process.

Our goal is to unleash your projects' full potential by minimizing time to market, mitigating risks, and identifying opportunities. To this end, we also give you sound recommendations on:

- Feasibility
- Cycle times
- Quality
- Implementation options
- Calculable data
- Costs for a prototype and start of production

Prototyping center

Space for innovation and technology

At our prototyping center in Wels, Upper Austria, we guarantee maximum confidentiality with several robot cells and systems that are partitioned off from one another. In an area covering 900 m2, our experts work to make your project a reality:

- Consulting and feasibility studies
- Simulations
- Mechanical processing (such as milling)
- Metallurgical analyses
- 3D component measurement
- Offline programming and welding simulation
- Welding tests with detailed data documentation
- Material testing and quality control
- Logistics
- Project management

Additive services

Prototyping & additive manufacturing

Take advantage of our team's capacity and expertise and outsource your additive manufacturing projects. Our experts handle all aspects of the process engineering and provide you with solutions that have been thoroughly tested and approved.

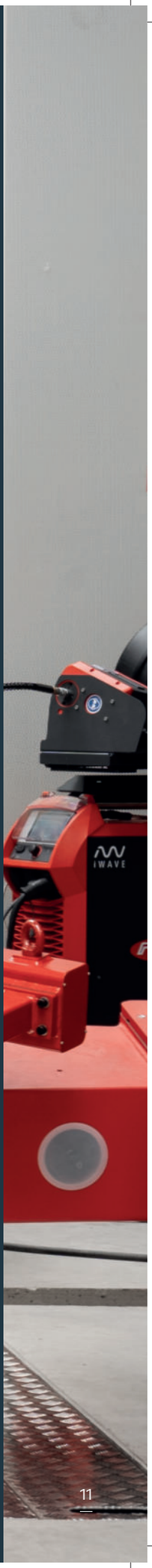
Ready-to-use additive "recipes"

Process development and parameter optimization

We develop, test, and certify the optimal welding and pressure parameters for your materials and geometries. Drawing on our many years of experience in additive manufacturing, we create robust, reproducible configurations that ensure high component quality and process reliability.

Working to a structured process, we optimize all welding variables from energy input and wire feeding to layer-by-layer deposition and thermal behavior. And we achieve this using state-of-the-art simulations and real-world validation.

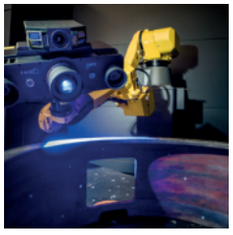
The result is a ready-to-use additive "recipe" that includes all parameters and processes. You can license this validated package directly for your own use and start working quickly, safely, and cost effectively, without any development risk on your part.



Reverse Engineering

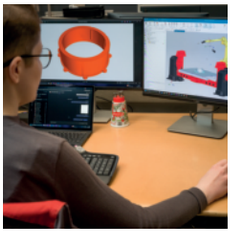
Step 1

Digitalization and reconstruction



Step 2

Programming the weld paths



Step 3

Additive manufacturing

Step 4

Mechanical finishing

Additive-manufactured spare parts on demand

Supply shortages, discontinued spare parts, or missing CAD data typically lead to production downtime. When critical components fail, their delivery time affects the productivity of entire plants.

We analyze, digitalize, and reconstruct defective or obsolete original parts and use Fronius Additive to manufacture new components that match the originals as closely as possible. Our Prototyping & Manufacturing Center has the entire process chain covered. The advantages for you include end-to-end quality assurance and certified component approval—all from a single source.

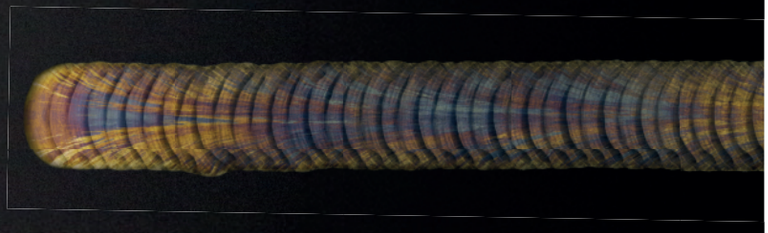
Metallurgy

Metallurgy and materials testing

Precision down to the microstructure

You don't have to choose between efficiency and quality. By combining cross-the-board expertise, the latest testing methods, and direct access to laboratory facilities, we deliver transparent results and reliable insights for your decision-making: so you can have confidence in your manufacturing process from start to finish.

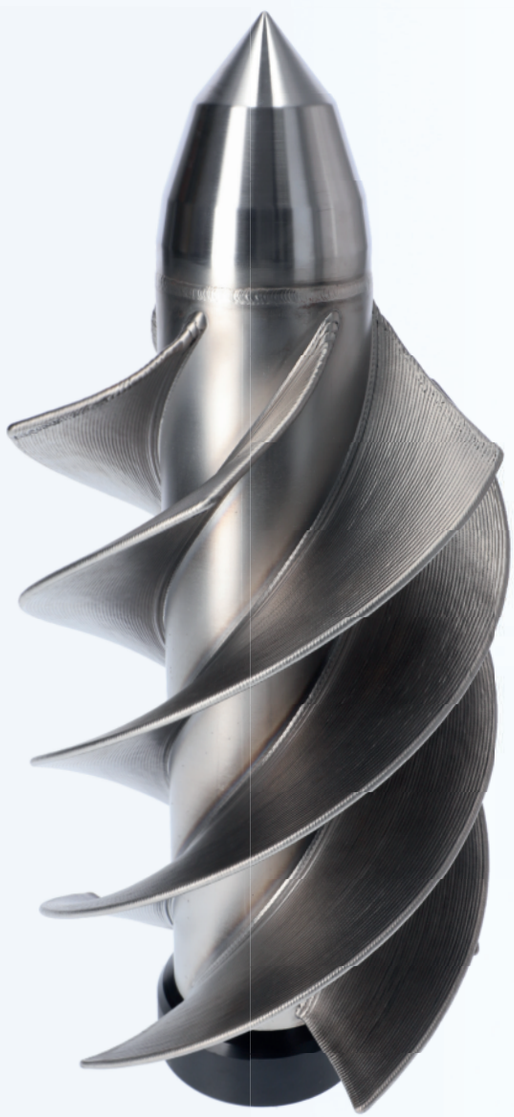
Maximum safety starts with the details



In modern manufacturing, material properties play a decisive role in safety and a long service life. Fronius offers a full range of metallurgy and materials testing to reliably verify the quality of your welded joints and ensure compliance with international standards.

Our experts help you ensure that your business is compliant with standards such as EN ISO 3834-2, EN 15085-2, and DIN 2303. Drawing on our experience and state-of-the-art analytical methods, we ensure that your manufacturing processes can withstand even the most rigorous audits and demands.

Combining
key factors
for your success



Wide range of materials

Many different materials can be used, including low-alloy steels, aluminum, nickel-based alloys, and stainless steel.

Material efficiency

A layered build-up keeps material usage to the required minimum. This reduces material consumption compared to conventional manufacturing methods.

Printing on demand

Spare parts and tools can be produced at any location right when they are required. In addition to incredible time savings and flexibility, the advantage of this method is that it eliminates transport and warehousing.

Reduced production costs

Large, complex tools and casting molds are no longer needed to produce components. This significantly speeds up prototype production and thus time to market.

Stable process

The Fronius Additive Features optimize the welding process, give you more control over heat input, and make it easier to start welding.

Connected by welding | United by passion

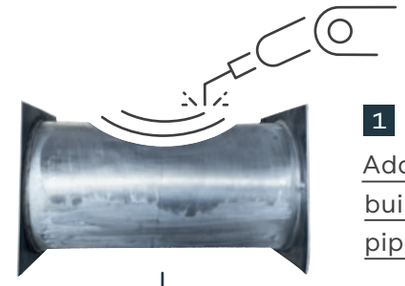
We focus on connections—between people, industries, and metals. Find out more here.

www.fronius.com/welding/aboutus

Additively manufactured pressure vessels

The application story on this component provides an insight into additive welding while highlighting the quality and safety that come with the prEN 13445-14 certification. Scan the QR code to view the documentation presenting the entire manufacturing process with this technology and everything it can do.

Pressure vessel technical data	
Welding process	CMT Additive Pro
Welding machine	iWave AC/DC 500i
Material	1.2 mm AlMg4.5Mn
Additive material weight	4.12 kg
Welding time	3 h 26 min
Deposition rate	1.2 kg/h



1 Additive build-up on pipe section

2 Finished component

For further information visit www.fronius.com

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