HERMITH

TITANIUM ADVANCED TECHNOLOGIES

HERMITH GMBH

- ADVANCED TITANIUM SOLUTIONS IN THE CENTER OF EUROPE

Aerospace

Automotive

Industrial

Medical

HERMITH
TITANIUM ADVANCED TECHNOLOGIES

CONTENT

- About Hermith. History of the company
- Approvals and Qualifications
- Production
- Advanced product development and R&D
- Market and customers

ABOUT COMPANY

HERMITH
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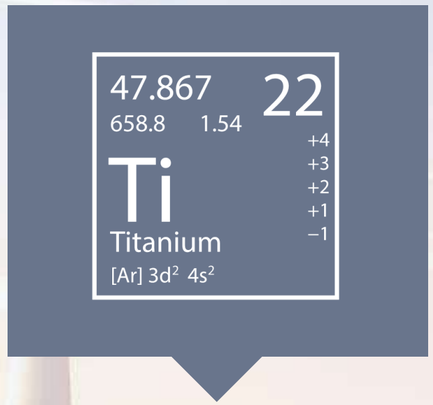
Based in Germany, Munich

17 years of experience

4 separate global markets



Titanium of high quality

Dozens of patents

ABOUT COMPANY

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2004

Founded in Munich, Germany

- Cooperation with leading titanium producers and project kickoff with car OEMs.
- Serving to the motorsport industry, predominantly F1 and F2.

2011

Hermith certified with EN/AS 9120 and ISO9001

- Ongoing projects with Aerospace OEMs & Tier suppliers.
- Established strategic cooperation with titanium parts supplier for the product development.

2016-2017

Awarded a prize of the German Government in nomination “Best exporting company in Bavaria”

- Fully integrated titanium production organized and certified acc.to EN/AS 9100.
- First design and engineering work on drawing welding wire line for additive technologies.

2018-2019

Improvement of own production

- First 36 tons for European aerospace approved and contracted.
- Preparation for the strategic cooperation in Russia establishing a Joint Venture for the production of titanium alloys and final products.

2020-2021

Active production, advanced research and development.

- Ongoing product development, actively collaborating and growing industries such as automotive spring wire, specialized medical alloys and wire production.

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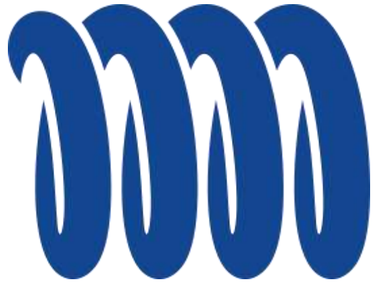

APPROVALS AND QUALIFICATIONS

APPROVALS AND QUALIFICATIONS

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TÜV NORD EN/AS 9100

TÜV NORD EN/AS 9120

TÜV NORD ISO 9001

TÜV NORD ISO 13485*

* QMS implemented, expecting official certificate by the end of 2021.

TÜV NORD

CERTIFICATE

Management system as per

EN 9100:2018

(technically equivalent to AS9100D and JIS Q 9100:2016 and in conformity with the requirements of ISO 9001:2015)

The Certification Body TÜV NORD CERT GmbH hereby confirms as a result of the audit, assessment and certification decision according to EN 9104-001:2013 and ISO/IEC 17021-1:2015, that the organization

Hermith GmbH
Englmannstraße 2
81673 München
Germany

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Details of certification structure „Campus" according to the annex

operates a management system in accordance with the requirements of EN 9100:2018 and will be assessed for conformity within the 3 year term of validity of the certificate.

applies a management system in line with the above standard for the following scope

Manufacture, stock holding and distribution of ingots, billets, bars, wires, sheets, stripes, plates and tubes and machining of these products in the entire range of titanium alloys

Certificate Registration No. 44 117 111040
Audit Report No. 3529 3173

Issue date 2021-05-27
Expiry date 2023-10-18
Initial certification 2017

Certification Body
at TÜV NORD CERT GmbH

Essen, 2021-05-27

TÜV NORD CERT GmbH Langemarckstrasse 20 45141 Essen www.tuev-nord-cert.com

DAkkS Deutsche Akkreditierungsstelle D-ZM-12007-07-00

BDLI German Aerospace Industries Association

TÜV NORD CERT GmbH is accredited by DAkkS within the ICOP-scheme.

TÜV NORD

CERTIFICATE

Management system as per

EN 9120:2018

(technically equivalent to AS9120B and SJAC 9120A and in conformity with the requirements of ISO 9001:2015)

In accordance with TÜV NORD CERT procedures and the EN 9104-001:2013, it is hereby certified that

Hermith GmbH
Englmannstraße 2
81673 München
Germany

HERMITH
TITANIUM ADVANCED TECHNOLOGIES

Details of certification structure „Campus" according to the annex

applies a management system in line with the above standard for the following scope

Stockholding and distribution of semi-finished titanium products such as ingots, billets, bars, wires, sheets, stripes, plates and tubes for aerospace industry

Certificate Registration No. 44 119 111040
Audit Report No. 3527 2739

Issue date 2020-08-04
Expiry date 2023-07-20
Initial certification 2017

Certification Body
at TÜV NORD CERT GmbH

Essen, 2020-08-04

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.

TÜV NORD CERT GmbH Langemarckstrasse 20 45141 Essen www.tuev-nord-cert.com

DAkkS Deutsche Akkreditierungsstelle D-ZM-12007-07-00

BDLI German Aerospace Industries Association

TÜV NORD CERT GmbH is accredited by DAkkS within the ICOP-scheme.

- ✓ All ingots melting and materials' production done within the Hermith production facilities.
- ✓ All final quality documents and material certificates issued by the Munich Office.

APPROVALS AND QUALIFICATIONS

HERMITH
TITANIUM ADVANCED TECHNOLOGIES

LEONARDO

PILATUS

BOMBARDIER

AIRBUS A220

LEONARDO
HELICOPTERS

Statement of Approval
No. : LH/0107

This is to Certify that

HERMITH GMBH

ENGLMANNSTR. 2
81673 MUNICH
GERMANY

is hereby approved as a Supplier to

Leonardo Helicopters

in accordance with QRS01 'Quality Requirements for Suppliers', the scope of which is defined within the attached Scope of Approval

Date of Issue: 28 November 2017

For, and on behalf of
Leonardo Helicopters

ROBERTO PIAS – Head of Quality System

This certificate unless cancelled, suspended or revoked shall continue in effect indefinitely

PILATUS

CERTIFICATE OF APPROVAL

HERMITH GMBH
PIL REF. 20188

Has been assessed by Pilatus Aircraft Ltd and found to be in conformance with requirements LEQ QAR'S.

APPROVAL FOR:

Raw Material for Aerospace

This approval remains valid under the condition that all applicable standards, regulations and quality requirements as of the date of the approval are maintained.

Qualification Date: 15.11.2019

Marco Barbaro
Director Quality Manufacturing

Rolf Mock
Quality and Process Manager

Pilatus Aircraft Ltd
P.O. Box 992, 6371 Stans, Switzerland
www.pilatus-aircraft.com

Certified to EN 9100/ISO 14001 standards
This Approval may be extended or withdrawn in writing by Pilatus at any time

✓ In 2019 Hermith GmbH received the Official Certificate of Approval from Bombardier Aerospace. The certification by Bombardier also qualifies Hermith to supply material for Airbus A220 programs (specifications: AMS4928, AMS4911, AMS4945, AMS6931).

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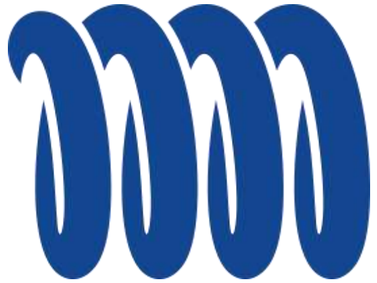


PRODUCTION

HERMITH OPERATIONS

HERMITH
TITANIUM ADVANCED TECHNOLOGIES

SOLIKAMSK
Titanium Sponge Producer

GLAZOV
Production campus 1

MOSKAU
Representative office

ZLATOUST
Production campus 2

MÜNCHEN
Headquarter

HERMITH PRODUCTION CYCLE

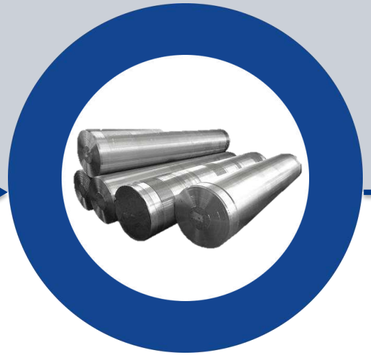
HERMITH
TITANIUM ADVANCED TECHNOLOGIES



Control at every stage


TITANIUM ORE, CONCENTRATE


PROCUREMENT OF SPONGE


INGOTS


PRODUCT

CUSTOMER

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TITANIUM ADVANCED TECHNOLOGIES

TITANIUM INGOTS PRODUCTION

Pressed briquettes Ø200…360 mm
for furnace electrodes

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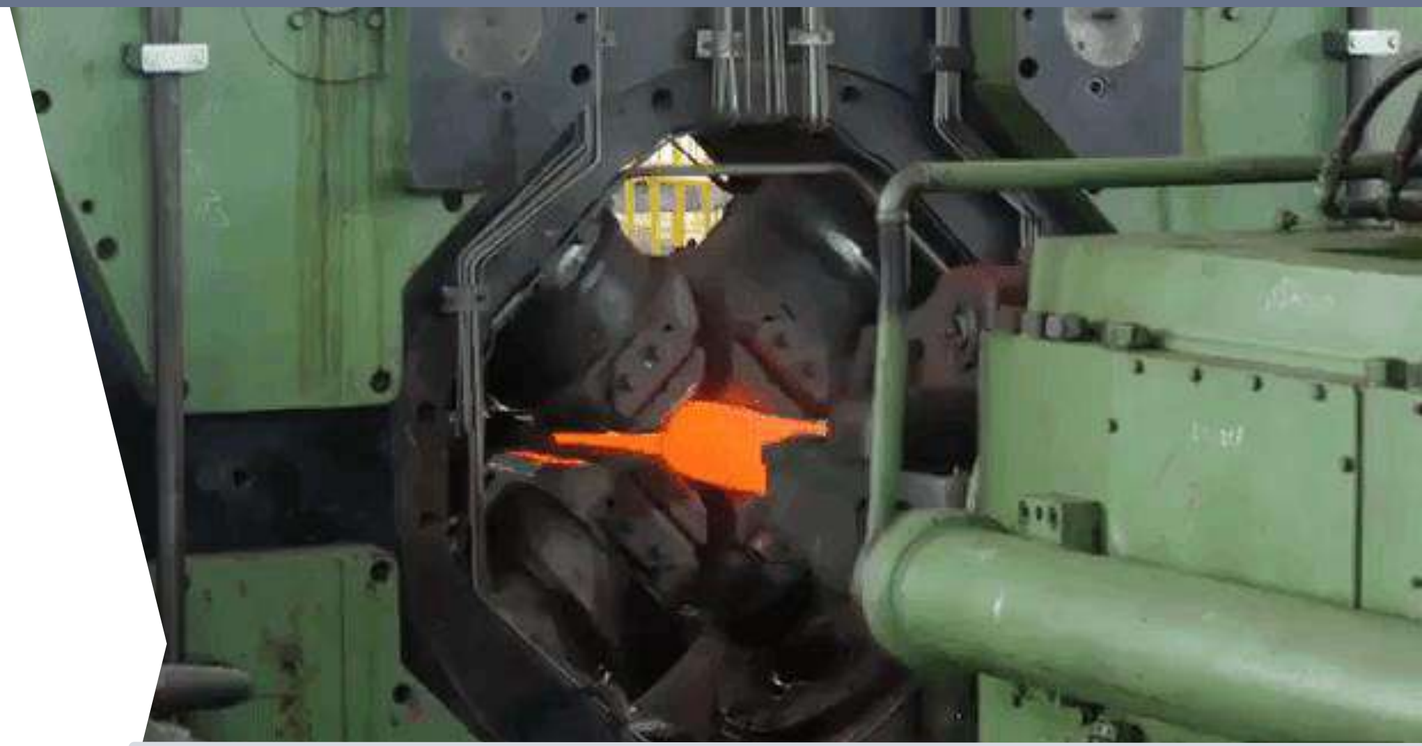
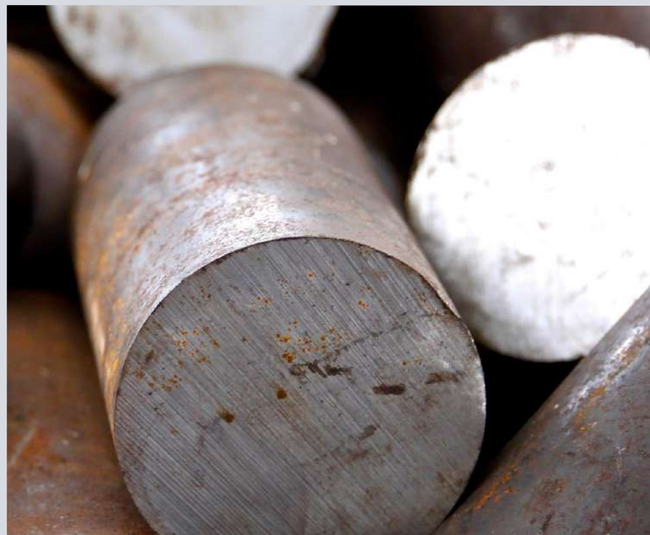
FORGING & HEAT TREATMENT

Hot forging process
(round and flat materials).
Heat treatment on horizontal
and vertical electric and
vacuum furnaces





HERMITH
TITANIUM ADVANCED TECHNOLOGIES

FORGING & HEAT TREATMENT

Hot forging process
(round and flat materials).
Heat treatment on horizontal
and vertical electric and
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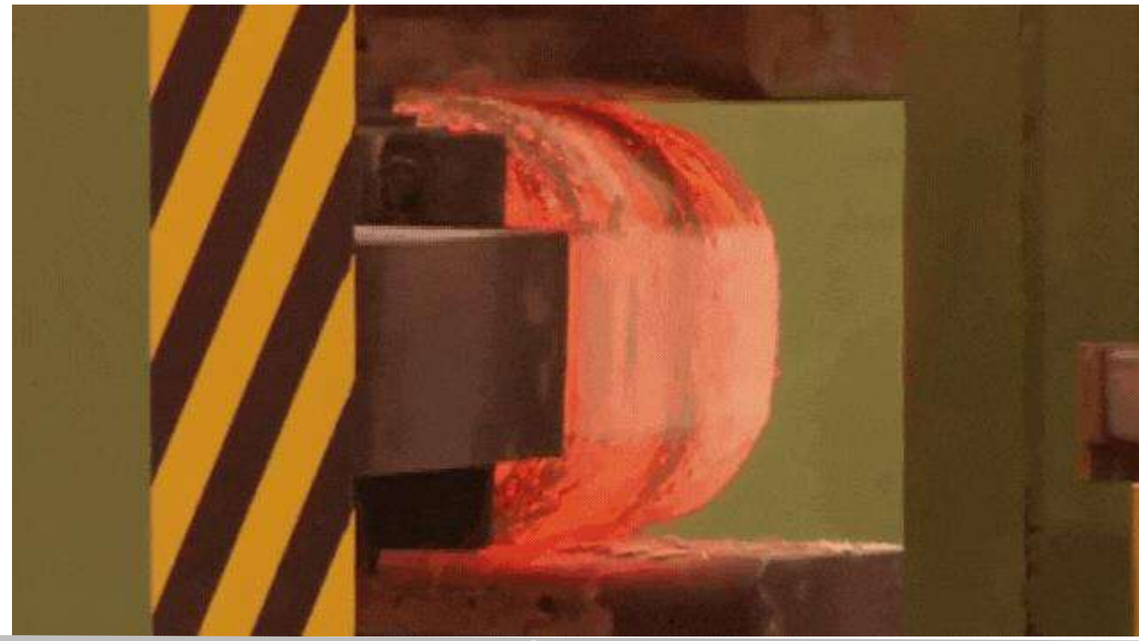
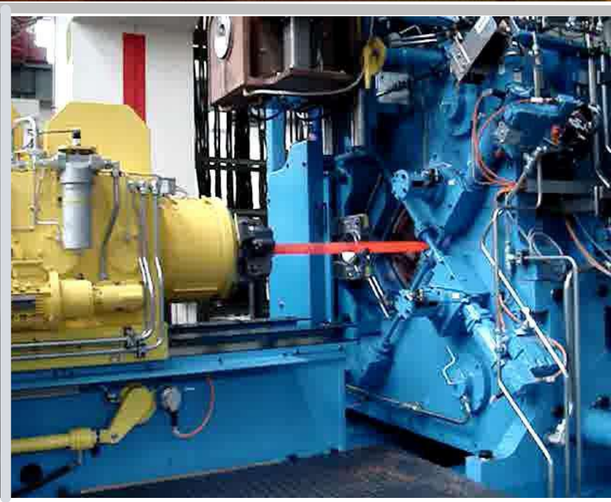


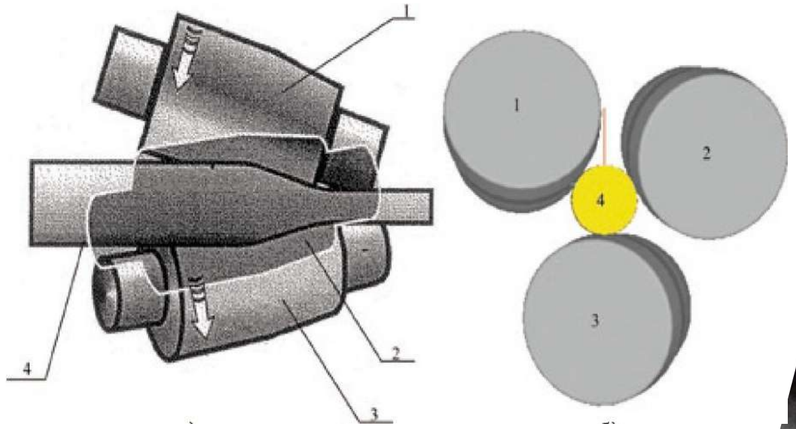


HERMITH PRODUCTION CYCLE

HERMITH
TITANIUM ADVANCED TECHNOLOGIES

ROLLING

Hot rolling process
(round and flat materials)



ROLLING DEFORMATION PROCESS

HERMITH
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HOT EXTRUSION AND HEAT TREATMENT

The billets of bars and tubes are extruded at various equipment as horizontal and vertical presses.

HERMITH PRODUCTION CYCLE

HERMITH
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QUALITY CONTROL

- ✓ Plasma mass spectrometer: range from 1·10-5 to 1·103 weight %;
- ✓ Non-destructive ultrasonic and eddy current inspection of final bars and tubes;
- ✓ Gas Analyzer for infra-red absorption measurements. Definition range is from 0.001 to 2.0%;
- ✓ Research equipment for digital investigation of metal structure.

HERMITH PRODUCTION CYCLE

HERMITH
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QUALITY CONTROL

- ✓ Each product is extensively tested prior to supply;
- ✓ Working hands on with customer requirements to ensure quality products.

PRODUCT APPLICATION

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AUTOMOTIVE

Suspension elements

Hardware for the aviation

AEROSPACE

Tubes and tube assemblies

Forgings for aviation

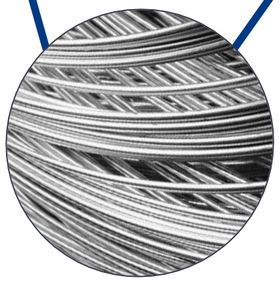
MEDICINE

Hardware for medicine

Orthopedic prostheses

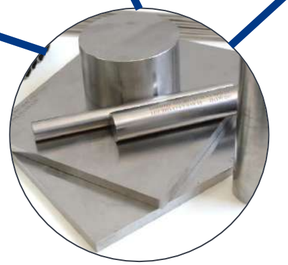
SONOTRODES

Sonotrodes



WIRE

TUBE



ROUND AND RECTANGULAR BARS/PLATES

Product application

Hermith **planned** product range

Hermith **current** product range

PRODUCT RANGE

HERMITH
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RECTANGULAR BARS

RANGE	Thk 35 — 160 mm / W 70 —300 mm	Thk 1.38" — 6.3" / W 2.76" — 11.81"
LENGTH	max. 2,4 m	max. 7.87 ft
ALLOY	Grade 5 (Ti-6Al-4V), Unalloyed Titanium (Gr 1,2,3,4), Ti-4Al-4Mo-2Sn	
STANDARDS	AMS 6931, AMS 2380, AMS 4928, AMS4921, MIL-T-9047, DIN EN 3351	

PLATES

RANGE	Thk 35 — 160 mm / W 70 —300 mm	Thk 1.38" — 6.3" / W 2.76" — 11.81"
LENGTH	max. 2,4 m	max. 7.87 ft
ALLOY	Grade 5 (Ti-6Al-4V)	
STANDARDS	AMS 4911, AMS 2380, ASTM B265	

ROUND BARS, BILLETS

RANGE	Ø4,5 — 450 mm *	0.18" — 17.72„ *
LENGTH	1 – 3 m, or by agreement	3.28 — 9.84 ft, or by agreement
ALLOY	Gr 5 (6Al-4V), Gr 23 (6Al-4V ELI), Ti-6Al-7Nb, Unalloyed Titanium (Gr 1,2,3,4), Ti-6Al-6V-2Sn, VT-16, Gr 19 (Ti-3Al-8V-6Cr-4Mo-4Zr), Gr 9 (Ti-3Al-2,5V), VT-16	
STANDARDS	AMS 2380, AMS 4928, AMS 6931, AMS 4981, AMS 6940, AMS 4978, AMS 4975, ASTM F67, ASTM F136, ASTM F1295, ASTM B348, ISO 5832-3, ISO 5832-11, Tolerance from h7	

WIRE

RANGE	Ø 0,8 — 7 mm	Ø 0.03" — 0.28"
ALLOY	Grade 23 (6Al-4V ELI), Unalloyed Titanium (Gr 1,2,3,4)	
STANDARDS	AMS 4951, AWS A5.16M/A5.16, ASTM F67, ASTM B863, ISO 24034	

* Ingots with Ø 450 are also offered.

SEAMLESS TUBES

RANGE	OD 4,75 — 50,8 mm / WT 0,41 — 1,3 mm	OD 0.19" — 2" / WT 0.016" — 0.051"
LENGTH	2 – 5 m, or by agreement	6.56 — 16.4 ft, or by agreement
ALLOY	Grade 9 (Ti-3Al-2,5V)	
STANDARDS	AMS 4943, AMS 4944, AMS 4945, MBBN 6001-6004	

By agreement, it is possible to manufacture products from other titanium alloys and using standards not specified in the list

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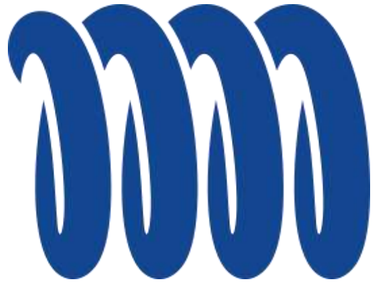


ADVANCED PRODUCT DEVELOPMENT AND R&D

TITANIUM PRODUCER IN THE CENTER OF EUROPE

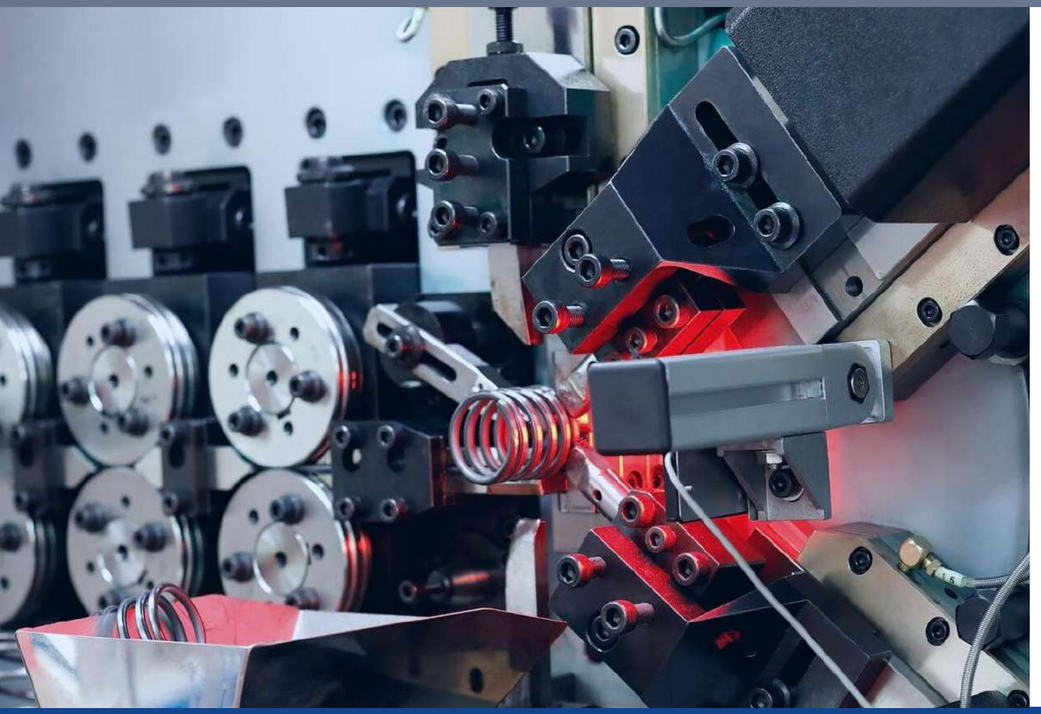
HERMITH
TITANIUM ADVANCED TECHNOLOGIES

Hermith works together with leading research centers such as DLR (German Aerospace Agency), the Universities of Graz, Stuttgart, Hamburg, Manchester and Cranfield to develop new titanium alloys for the aerospace and automotive industries.

Thanks to vertically integrated production, Hermith is able to develop and provide the most preferable alloy and product for the customer's needs.

TITANIUM ALLOY FOR SUSPENSION SPRINGS

HERMITH
TITANIUM ADVANCED TECHNOLOGIES

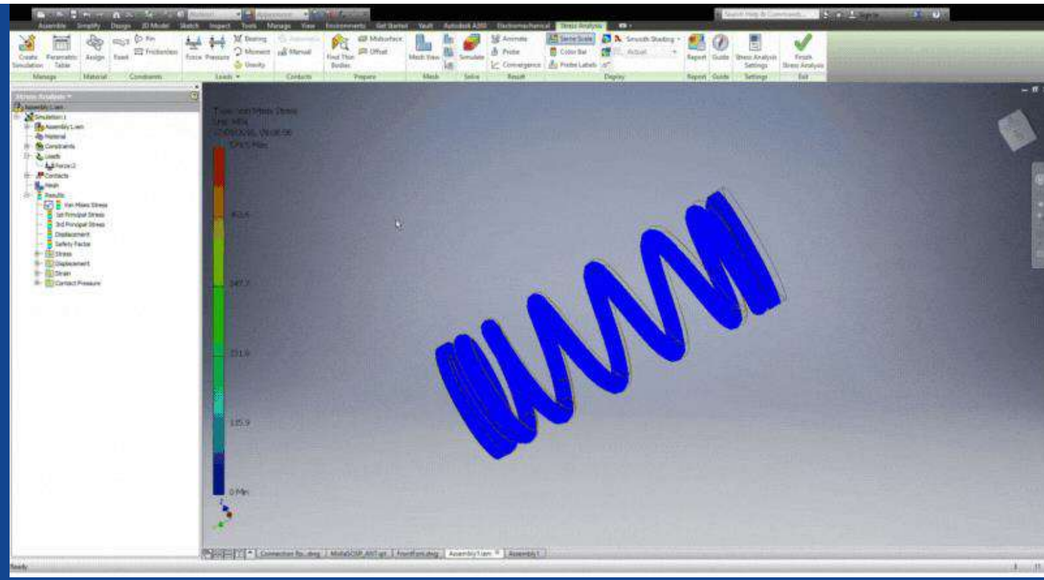


PRODUCTION DEPARTMENT

Using the advanced experience of our engineers and innovative equipment, we intend to produce the world's highest quality titanium alloy for springs, that are specifically designed for premium and luxury cars manufacturers.

R&D DEPARTMENT

In order to produce the titanium alloy of the highest quality for suspension springs, our production department is deeply involved in different R&D operations which already resulted in five patented inventions (chemical composition, cold deformation processes, etc.)



TITANIUM ALLOY FOR SUSPENSION SPRINGS

HERMITH
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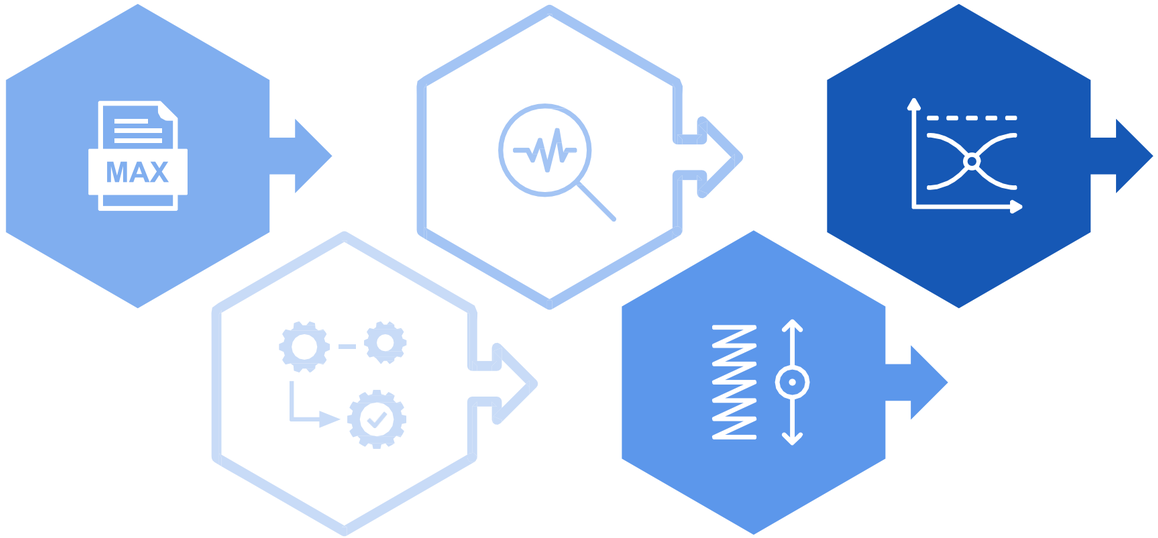
Requirements developed by Hermith GmbH for the creation of the new technology

Step 1

Defining the maximum and working sheer torsional stress

Step 2

Defining the permissible cyclic stresses in an asymmetric cycle



Step 3

Plotting a stress strain curve depending on mechanical properties

Result

Selection of the optimal alloy and development of semi-finished material technology for springs production

TITANIUM ALLOY FOR SUSPENSION SPRINGS

HERMITH
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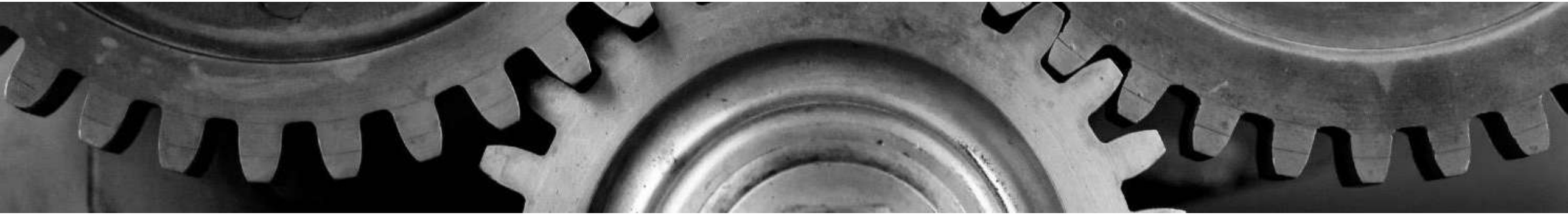
OUR OWN TITANIUM ALLOYS

for the manufacturing of high-strength springs

In 2017 as a result of research and development work Hermith GmbH has created the “Hermith Spring Alloy 2” alloy, which is a perfect match for using in spring constructions for automobiles due to its unique mechanical properties.

HERMITH WIRE FOR ADDITIVE APPLICATION, 3D-PRINT

HERMITH
TITANIUM ADVANCED TECHNOLOGIES



TITANIUM WIRE FOR ADDITIVE PRODUCTION
UNIQUE HIGH-PERFORMANCE TECHNOLOGY FOR THE PRODUCTION OF TITANIUM WIRE DEVELOPED BY HERMITH

Hermith GmbH has developed a unique high-performance technology for the production of titanium wire, which serves as raw material (feedstock) for the manufacture of large and complex parts using additive technology.
In 2021, Hermith is launching mass production of wire for additive applications to supply the aerospace industry with finished parts produced on a 3D printer in the shortest possible time.

PROJECT/PRODUCT ADVANTAGES

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Product Advantages

EFFECTIVE TECHNOLOGY

New drawing method of Hermith GmbH is more efficient than traditional cold rolling products

TECHNOLOGICAL COMPETENCIES

Availability of equipment and competencies of CMP JSC for the manufacture of titanium products

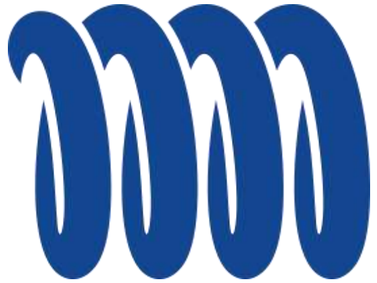
CUSTOMER PROFIT

Additive wire is cheaper and more efficient than powders

MARKET KNOWLEDGE

Hermith GmbH experience in the international titanium market

HERMITH
TITANIUM ADVANCED TECHNOLOGIES



MARKET AND CUSTOMERS

OUR CUSTOMERS

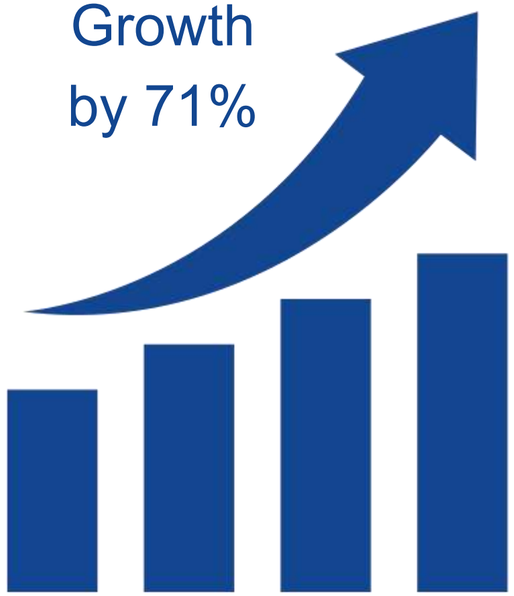
HERMITH
TITANIUM ADVANCED TECHNOLOGIES

HERMITH

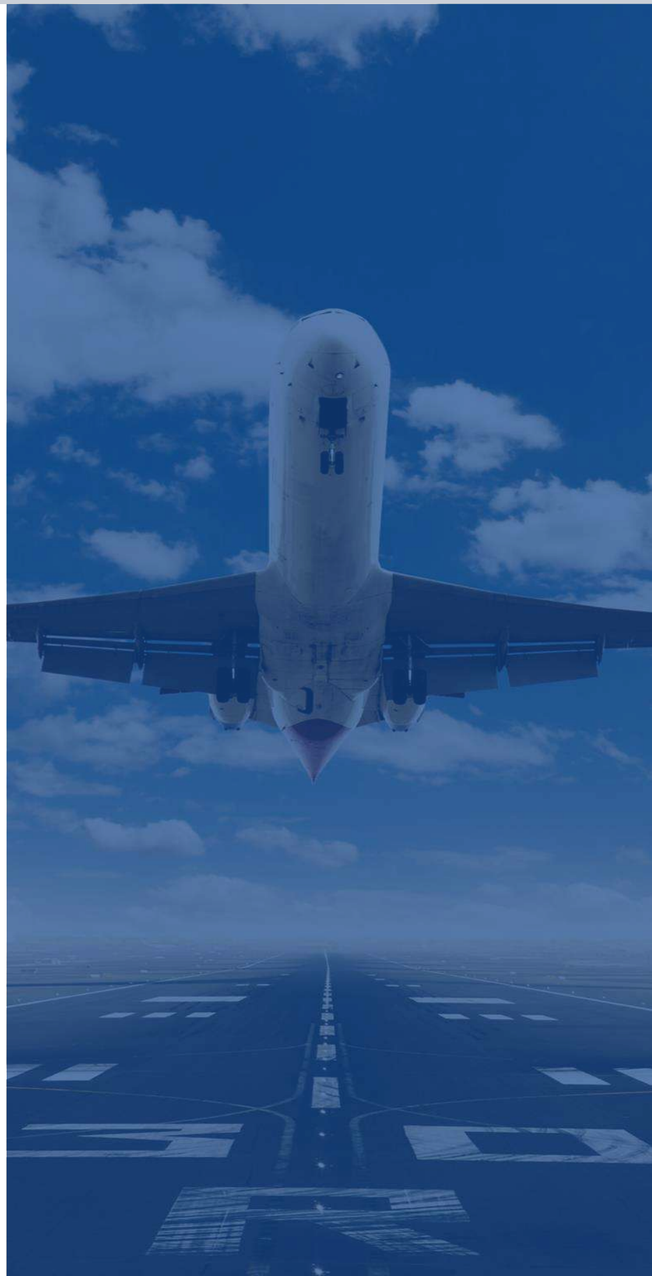
- Over 2000 customers
- Over 20 countries covered
- 10 languages spoken
- 17 years of experience

MAJOR FIGURES

HERMITH
TITANIUM ADVANCED TECHNOLOGIES



EBITDA in 2018 - 2020



In 2016, Hermith was awarded a prize of the German Government in nomination "Best exporting company in Bavaria".

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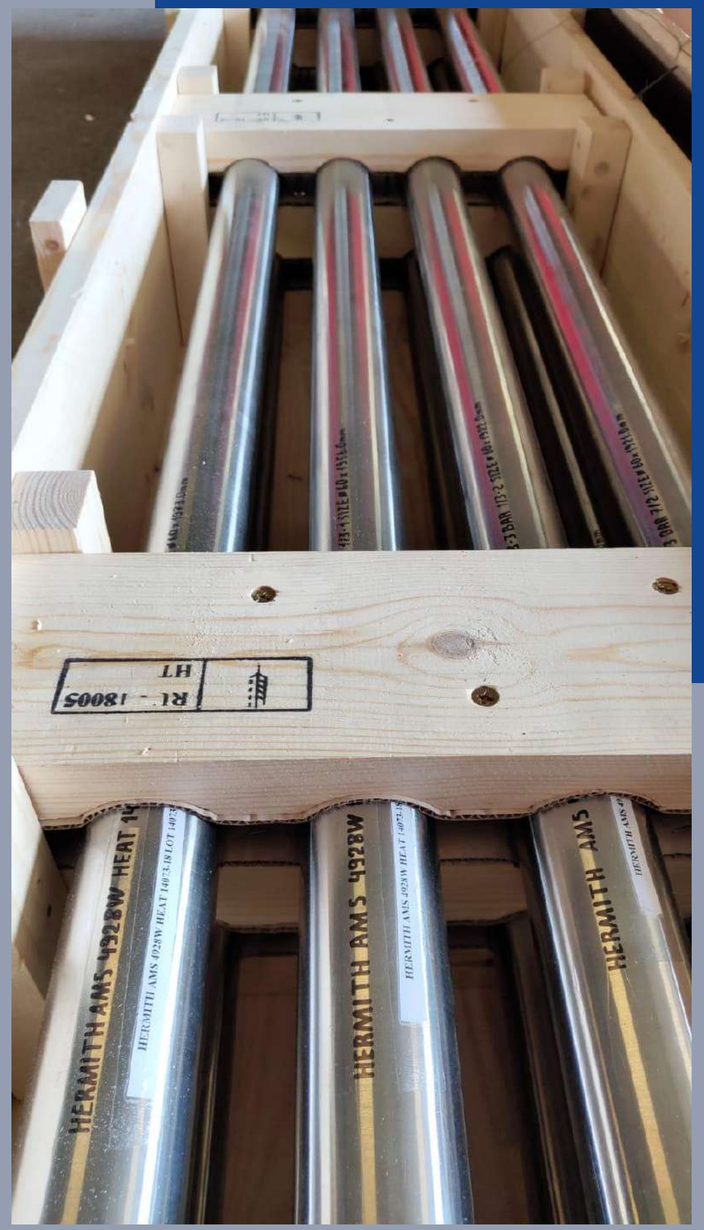
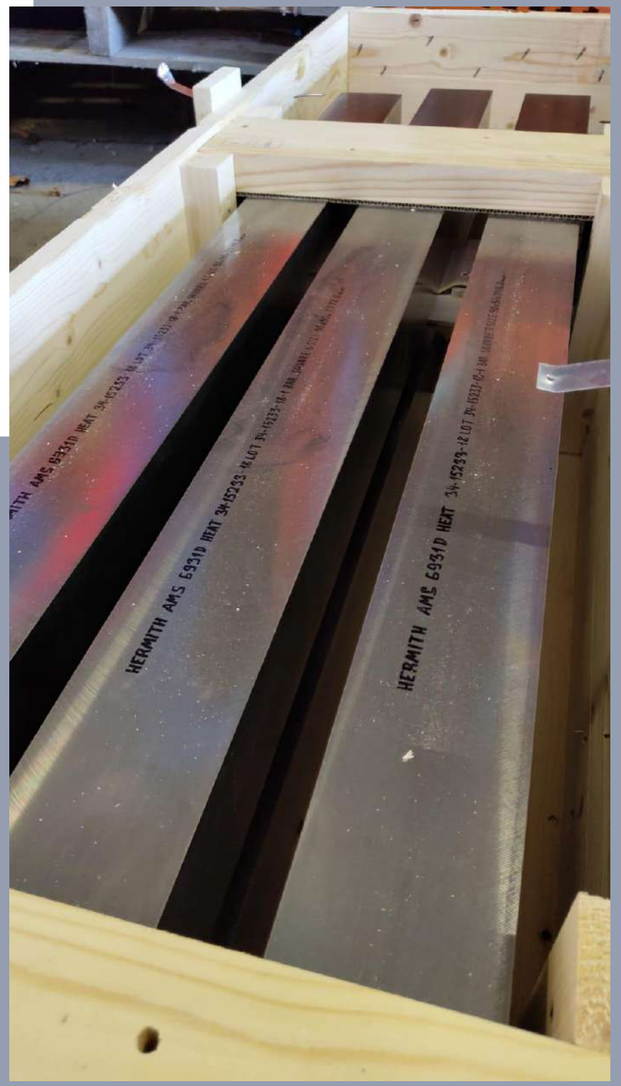
PACKING AND DELIVERY





HERMITH
TITANIUM ADVANCED TECHNOLOGIES

TOGETHER WITH HERMITH

Advantages of working with us

HEADQUARTERS IN EUROPE

OEM APPROVALS RECOGNITION IN EUROPE

We can solve any technical issue related to titanium materials

QUALIFIED TEAM

Our experienced team is always at your disposal

R&D

Our experienced team is always at your disposal

ESTABLISHED REPUTATION

We are proud of reliable partner reputation among the OEMs

HERMITH

TITANIUM ADVANCED TECHNOLOGIES

CONTACT INFORMATION

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