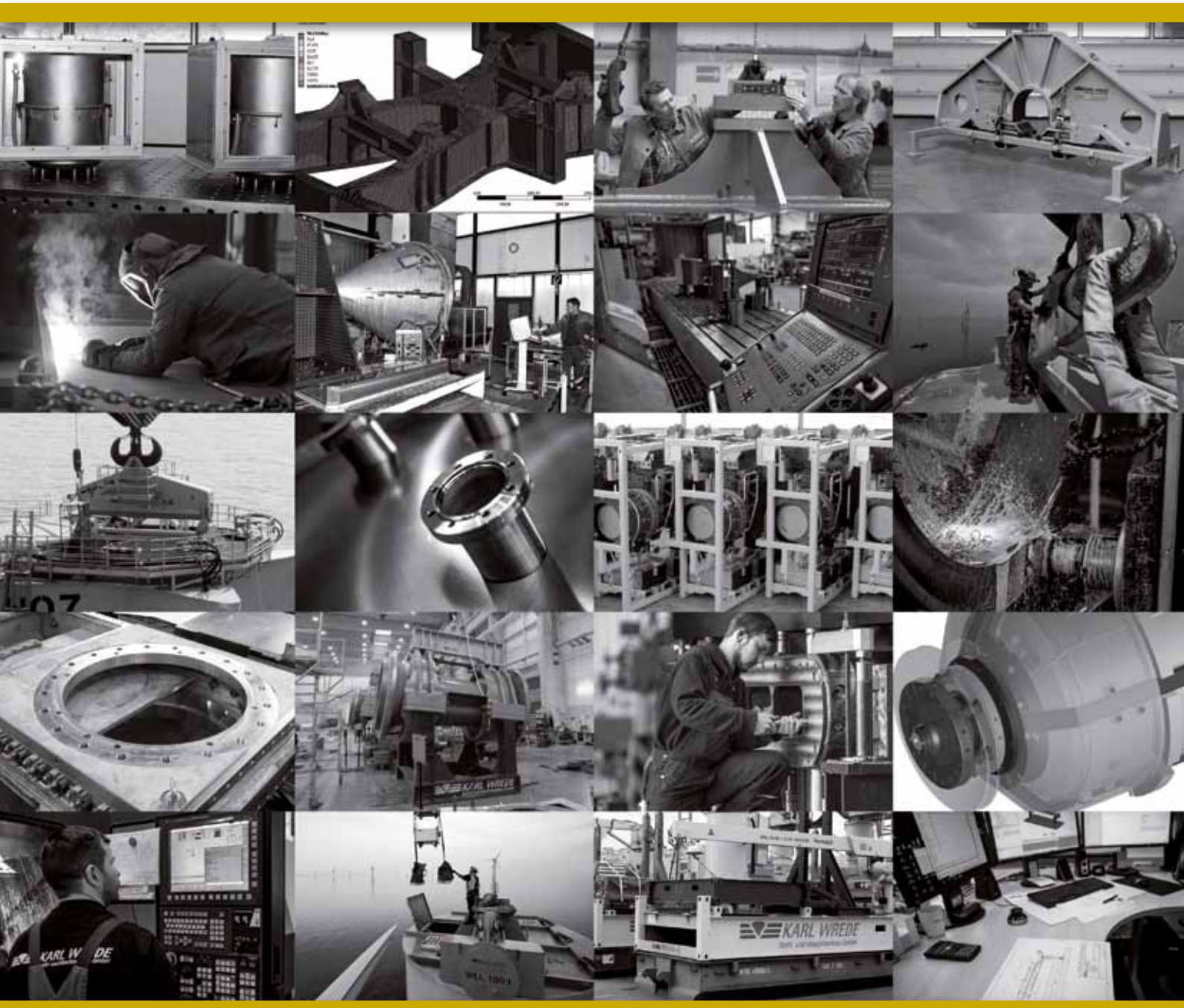
KARL WREDE

Stahl- und Maschinenbau GmbH



Design | Calculation | Manufacture

Complete One-stop Solutions

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Karl Wrede Stahl- und Maschinenbau GmbH is a modern, second generation family-owned SME enterprise with 40 employees. For more than 50 years, the company has been based in Eddelak, a location within the Hamburg metropolitan area.

Complete One-stop Solutions
Our enterprise is proud to offer one-stop solutions under one roof – from our in-house design and calculation department to manufacture and delivery of the finished product. We put the highest emphasis on **communicating quickly and directly** with our clients, offering maximum **flexibility** while strictly adhering to the required standards of **quality**.

Versatility is our strength
Our large and modern machinery enables us to offer contract manufacturing of **welded assemblies up to a unit weight of 25 t**, with or without mechanical machining, ranging from sheet metal constructions to turned and milled parts as single item or small series manufacture.

From **laser-cut edge parts to precision-made individual components** or **mechanical machining of large components**: our clients value the wide range of manufacturing possibilities we offer. In the field of industrial services, we provide **just-in-time repairs** of mechanical engineering components and the **manufacture of spare parts**, as well as the **service and maintenance** of production plants.

Our dedicated and highly qualified team will ensure the optimum solution for your assignments, fulfilling your requirements in a dependable, timely, and professional manner.

RANGE OF SERVICES

- **Design and calculation**
- **Welded constructions up to 25 t**
- **Sheet metal work**
- **Mechanical manufacturing / machining of large parts**
- **Manufacture of assemblies**
- **Service and maintenance**
- **Just-in-time repairs**

Enterprise Data

Established in:	1960
Form of Enterprise:	GmbH
Managing Director:	Dipl.-Ing. (SFI) Jan Wrede
Location:	25715 Eddelak
Employees:	40
Manufacturing area:	4.000 m^2

Quality

Our quality management system has been certified by **TÜV NORD CERT GmbH** according to **DIN EN ISO 9001:2015,** which serves to increase our competitiveness, while simultaneously helping to build client trust regarding product quality and deadline reliability due to clear and proven work processes.

Welding is considered a „special process" according to **DIN EN ISO 9001**. In order to document compliance with the specifications of the standard for the special process of welding, we meet the comprehensive requirements of **DIN EN ISO 3834-2**. Our production is certified for the manufacture of steel and aluminum supporting structures according to **DIN EN 1090-2 EXC 3** and **DIN EN 1090-3 EXC 3**. Furthermore, we are certified according to **DIN 2302 Q2 / BK1-BK**4 for the welding of defense-related products and are recognized as a manufacturer of pressure equipment according to **AD 2000-Merkblatt HP0**. In addition, we have a **DNV Welding Workshop Approval Certificate (WAA)**.

Our occupational health and safety management system complies with the norms and guidelines of, among others, **OHSAS 18001** and **SCC**, to fulfill all demands of workplace health and safety. Successful certification in the areas of production and assembly allows us to showcase our expertise and secure our clients' trust.

MITUTOYO Euro-C A9166
Coordinate Measuring Machine

Mobile FARO® Edge 7-axis Measurement Arm

APPROVALS/CERTIFICATES

DIN EN ISO 9001:2015	Quality management system
DIN EN 1090-2 EXC 3	Load-bearing components and kits for steel structures
DIN EN 1090-3 EXC 3	Load-bearing components and kits for aluminum structures
DIN EN ISO 3834-2	Comprehensive quality requirements of fusion welding
AD 2000-Merkblatt HP0	Manufacture of pressure vessels
DIN 2303 Q2/BK1 – BK4	Welding of defense products
DNV WELDING WORKSHOP APPROVAL CERTIFICATE (WWA)	
In-house NDT-specialists	DIN EN 473 UT, MT, PT (Level 2)
Certified welders	DIN EN ISO 9606 (MAG, MIG, WIG, E-Hand)
Re-stamping agreement	TÜV NORD Systems GmbH
SCC	Safety Certificate for Contractors, version 2011

Design and Calculation

Our in-house design department employs up-to-date methods and modern CAD- and calculation software to develop individual, custom-made solutions for our clients. The tight integration of design and manufacture enables us to come up with results that are both practical and production-ready.

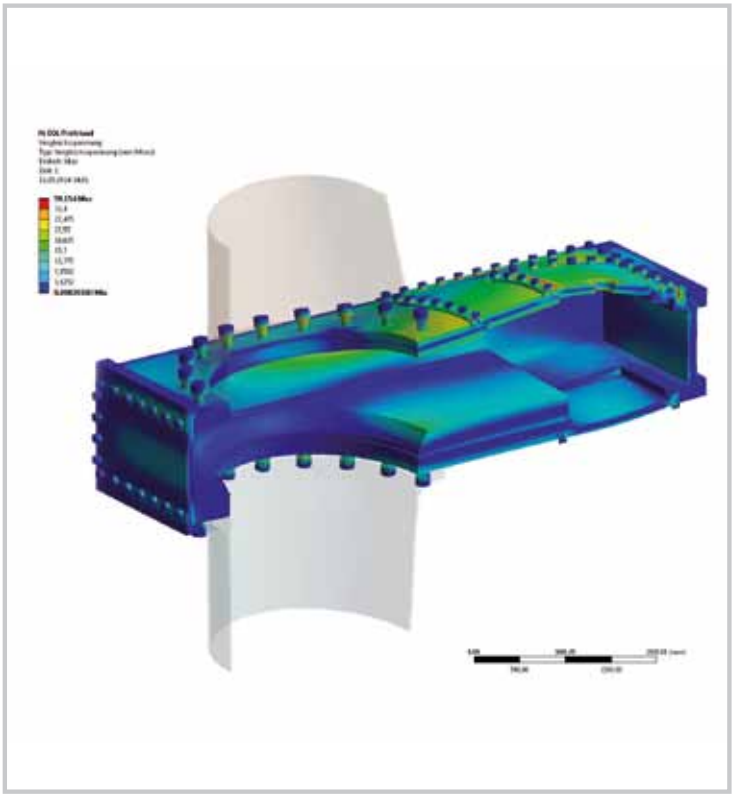
We develop and manufacture, among others, various devices, operating and transport equipment, lifting devices, appliances and pressure vessels, as well as special-purpose constructions to clients' specifications.

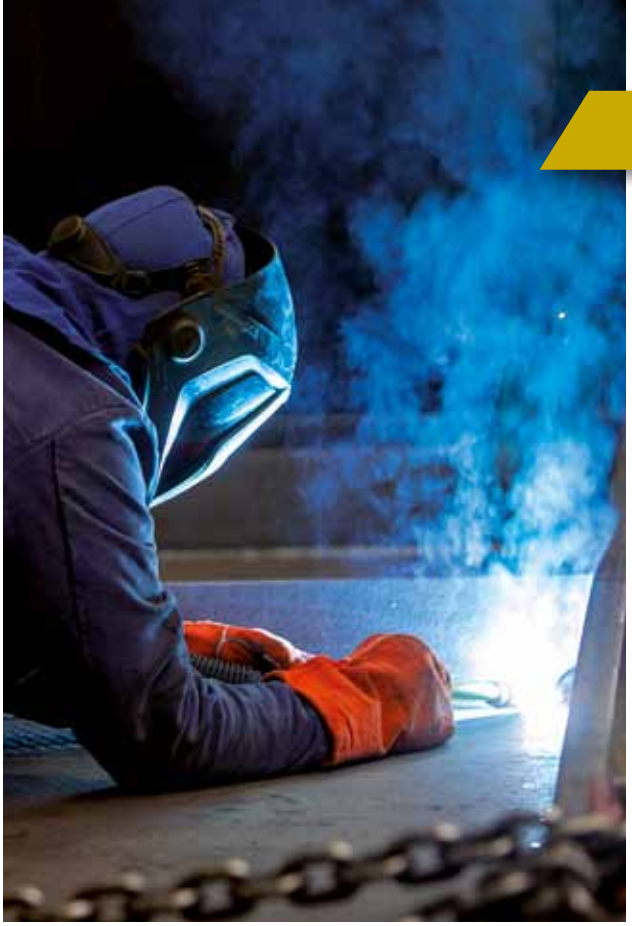
Our clients come from such diverse fields as chemical plant engineering, the food industry, or the wind energy sector; they all value our ability to cater comprehensively to their specific requirements, developing and delivering suitable tailor-made solutions on schedule.

The necessary proof calculations for manufactured parts are carried out in-house in accordance with the applicable rules and regulations. As required, we will ask a classification society or other suitable notified body to accompany the certification and parts approval. We supply technical documentation in accordance with machinery directive.

OUR AREAS OF FOCUS

- 3D-design (Autodesk INVENTOR)
- Structural frame and truss analysis (RSTAB)
- FEM-analysis (ANSYS Pro NLS)
- Verifiable calculation documentation
- Operating instructions
- Risk assessments
- Optional: external certification





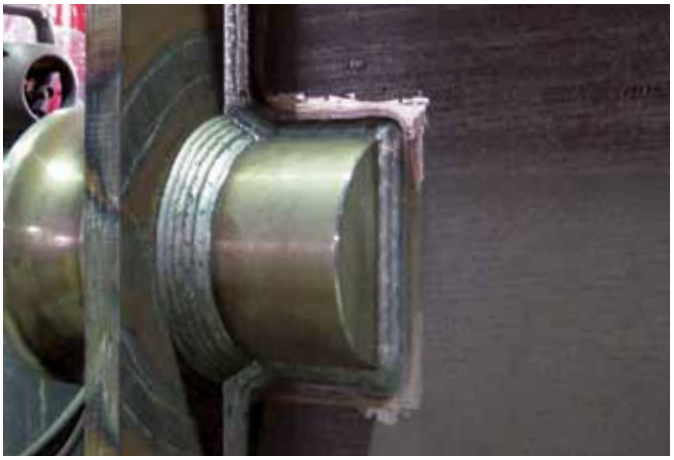
Welded Constructions

Our 4,000 m² production floor is equipped with modern production facilities, allowing us to manufacture welded constructions up to a unit weight of 25 t, with or without mechanical machining.

Our production is certified according to **DIN EN 1090-2 EXC 3** and **DIN EN 1090-3 EXC 3** for steel and aluminum supporting structures.

Our certified welders use state-of-the art pulsed MIG/MAG welding technology and Siegmund precision welding table systems to manufacture technically challenging, high-quality welded constructions.

We process both conventional and high-strength construction steels, CrNi-steels, aluminium- and nickel-based alloys, based on welding procedure specifications (WPS) and procedure qualification records (WPQR). A continuously high level of product quality is achieved and maintained by our NDT specialists and our in-house production control (WPK), which has been certified by TÜV Nord Systems.



Reference Components Welded Construction

250 t coupling crossbeam

Load testing setup 950 t beam

Load test padeyes

Transport frame 480 t

280 t strut and lifting beams
offshore wind turbine towers

40‘ flat rack

Preparation on 3D-welding table system

Turning device for machine housing

Sheet Metal Work

This is another sector in which we can deliver **complete one-stop solutions** if and when required.

In close consultation with our clients, we develop complete solutions tailored to their specifications. We will also supply production-ready drawings, manufacture **single components** or **assemblies**, or deliver the **finished product**, ready for installation.

In the chemical industry sector, our clients prefer working with us when it comes to implementing ideas for **custom designs** from the areas of process engineering, apparatus engineering, and container manufacture – from the first rough draft to prototypes and, finally, the operation-ready machine.

Our successful manufacturing process is based both on our highly qualified team and an extensive, modern range of machinery. A laser cutting system, three CNC press brakes, and four plate bending roll machines only form part of our machinery, enabling us to manufacture a broad spectrum of components.

RANGE OF PRODUCTS

- Laser parts
- Edge parts
- Rolled parts
- Transition pieces
- Manufacture of individual components or assemblies
- Manufacture based on pattern
- prototype building
- Single item or small series manufacture
- Development of individual solutions for chemical apparatus engineering and container manufacture

Machinery List

Laser Cutting Machine PRIMA POWER Zaphiro
CO2-laser with 4 kW, sheet thickness from 0.5 to 25 mm

CNC Plate Shear DURMA CNC VS 6013 - 13 mm x 6,000 mm

CNC Press Brake DURMA AD-S 60.600 - 600 t x 6,000 mm

CNC Press Brake ERMAK SPEED-BEND - 400 t x 3,000 mm

CNC Press Brake g.a.d.e. PRAECISA - 200 t x 3,000 mm

3-roll Plate Bending Roll Machine FACCIN HAV 3145
roll bending capacity: 3,050 mm x 45/35 mm (4xD/1,5xD)

CNC 4-roll Plate Bending Roll Machine IMCAR 4RH 8/5
roll bending capacity: 3,050 mm x 7, pre-bending capacity: 5 mm

4-roll Plate Bending Roll Machine AK-BEND AHS 2010
roll bending capacity: 2,100 mm x 13, pre-bending capacity: 10 mm

3-roll Plate Bending Roll Machine AK-BEND AS 90-10/8.0

Section Bending machine AK-BEND APK 81

Automated Sheet Metal Storage System KASTO UNITOWER C 1.2

Pivotal Folding Machine GÖTENEDS 2,500 mm

Plate Shear WILA HS 255-4

Variable Angle Notcher BOSCHERT K30-120

Punching and Nibbling Machine TRUMPF TAS 64

CNC Automatic Bandsaw MEBAeco 410 DGA-2300

Circular Saw EISELE VMS-I-S-PV and VMS-II-S-PV

Combination Section Cutter PEDDINGHAUS 210 Super 13

Hydraulic Hole Punch PEDDINGHAUS Hydraulic 500

Tube Saw GF Orbitalum RA 41 Plus

GRIT Belt Sander, GRIT Polishing Machine, Pipe Notch Machine

Injector Blast Cabinet NORMFINISH

Bead Blast Cabinet NORMFINISH

18 x pulsed MIG/MAG Welding Machines (Kemppi, EWM, Fronius)

13 x TIG Welding Machines (Kemppi, EWM)

11 x 3D Welding Table Systems Siegmund System 28

Laser Cutting Machine
PRIMA POWER Zaphiro

CNC Press Brake
DURMA AD-S 60.600

Plate Bending roll Machine
FACCIN HAV 3145

Section Bending Machine
AK-BEND APK 81

Mechanical Manufacture

Manufacture of large components up to 25 t unit weight, single items, small or medium series, turned and milled parts, or deadline-critical just-in-time repairs – whatever our clients are looking for, they can trust in our high quality of execution, consistent precision, flexibility, and timely delivery.

In our mechanical manufacturing department, our experienced and highly qualified team employs modern CNC-controlled machine tools, as well as their conventional counterparts in case of repairs. CNC programs for complex operations are programmed using the 3D CAD model of a CAM system and then transmitted directly to the machine tool via DNC connection.

We offer our clients short-term manufacture of spare parts (based on patterns, drawings, or 3D models), as well as parts repair – in urgent cases even overnight! Maximum flexibility in the areas of service, repairs, and spare parts delivery forms part of our daily business.

MECHANICAL MANUFACTURE

- CNC machining of large parts
- CNC milling with 5-axis milling technology
- CNC milling and turning (combined)
- CNC turning CNC-guided drilling 3D CAD with CAM integration / DNC connection
- CNC coordinate measuring machine
- Carousel turning (conventional)
- Turning and milling (conventional)

Mechanical Manufacture – Maintenance and Repairs

In case of machine failure, quick repairs will always be the primary objective, in order to minimize costly downtime and resume production as soon as possible. Every day, clients profit from our valuable services in the area of maintenance and repairs.

From maintenance work on single components or assembly groups to the manufacture of spare parts – our clients can count on our comprehensive support and technical expertise: We are your reliable partner when trouble strikes. A large machinery range, a well-qualified and experienced team, and our operational flexibility form the base for our high performance capacity.

Our clients include, among others, enterprises from the chemical and food industries as well as the wind energy sector.

RANGE OF PARTS

- Pump, gear, and rotor shafts
- Dryer and stirrer shafts
- Pump and fan impellers
- Pump and stirrer lanterns
- Chainwheels and cogwheels
- Flywheels and travel wheels
- Rotors (rotary valves)
- Drums and (mill) rollers
- Heat exchanger and transfer line exchanger hoods
- Decanter housings
- Column plates
- Adaptor, special purpose, and block flanges
- Couplings
- Thermal sleeves
- Pump and motor consoles

Machinery List

CNC Moving Column Milling Machine ANAYAK HVM 12000

CNC Moving Column Milling Machine ANAYAK HVM 12000
t-construction and moving column in x- and y-axis
fixed bench 13,000 x 3,000 mm, 10 t/m^2
travels x/y/z 11,300/2,000/2,400 mm
max. component weight 25 t

Vertical Turret Lathe SCHIESS KZ 400-450
surface plate diameter 4,000 mm
max. swing diameter 4,500 mm
max. turning height 2,350 mm
max. surface plate load 16 t

Vertical Turret Lathe SCHIESS KZ 250
surface plate diameter 2,500 mm
max. swing diameter 2,700 mm, max. turning height 1,400 mm
max. surface plate load 10 t

CNC Bench Drilling Machine UNION KC 130/1

5-axis Machining Centre DMG DMU 100 P duoBLOCK
travels x/y/z 1,000/1,000/1,000 mm
max. table load 2,000 kg

Horizontal Boring and Milling Machine UNION KC 130/1
with pallet changer
travels x/y/z/w 3,200/2,500/1,500/800 mm
max. table load 8,000 kg

Horizontal Boring and Milling Machine UNION TC 110
with pallet changer
travels x/y/z/w 1,500/2,000/1,600/550 mm
max. table load 4,000 kg

CNC Bench Drilling Machine UNION TC 110

CNC Turning and Milling Centre DOOSAN PUMA 700LM
45 kW, 5,419 Nm torque
max. turning Ø 900 mm
max. turning length 3,200 mm
driven tools

CNC Lathe SPINNER TC 800-110-MCY
swing/turning Ø 800/500 mm
max. turning length 900 mm
driven tools, y-axis

CNC Lathe SPINNER TC 800-85-MCY
swing/turning Ø 800/500 mm
max. turning length 900 mm
driven tools, y-axis, counter spindle

Carousel Lathe SCHIESS KZ 400-450

CNC Lathe KREWEMA HFDM ZS 475 x 3000/FA
max. swing Ø in the recess 1,600 mm
max. turning Ø over bed 935 mm
max. turning Ø over cross slide 620 mm
max. turning length 2,185 mm
max. turning length with extended bed 3,385 m

Heavy Duty Lathe RAVENSBURG P28
swing Ø over Support 2,800 mm / in pit 5,500 mm
max. turning length 7,000 mm

Machinery List

CNC Machining Centre HAAS VF-8
travels x/y/z 1,626/1,016/762 mm
max. table load 1,814 kg, 4th axis

CNC Machining Centre QUASER MV 184 P
travels x/y/z 1,020/610/610 mm
max. table load 500 kg

CNC Lathe SPINNER TC 400-52-MC
swing/turning Ø 400/280 mm
max. turning length 500 mm

CNC Milling Machine Tomasi FBF 20.1
table size 2,000 x 800 mm
travels: x/y/z 1,860/800/860 mm

Vertical Milling Machine Stankoimport PL 73005
table size 1,320 x 320 mm
travels: x/y/z 750/250/320 mm

Center Lathe VDF Wohlenberg V1000
max. swing Ø over bed 1,000 mm, max. turning length 5,000 mm

Center Lathe VDF Boehringer V800 II
max. swing Ø over bed 1,000 mm, max. turning length 2,000 mm

Center Lathe VDF Boehringer V800
max. swing Ø over bed 800 mm, max. turning length 3,000 mm

Center Lathe VDF Boehringer E560
max. swing Ø over bed 560 mm, max. turning length 1,500 mm

Center Lathe VDF Boehringer D530
max. swing Ø over bed 530 mm, max. turning length 2,500 mm

Center Lathe VDF Boehringer D420
max. swing Ø over bed 420 mm, max. turning length 1,100 mm

Radial Drilling Machine RABOMA 12 UH 2000

Keyseating Machine POLYMAT 50

CNC Band Saw Machine Kaltenbach KB 700NA
max. cutting range Ø 700 mm

CNC Band Saw Machine Kaltenbach KBR 350
max. cutting range Ø 350 mm

CNC Band Saw Machine SABI PBS 250A
max. cutting range Ø 250 mm

Coordinate Measurement Machine MITUTOYO Euro-C A9166
Measuring range x/y/z 900/1,600/600 mm

Mobile Measurement Arm FARO® Edge 3.7 m

InventorCAM Programming Station

CNC Turning and Milling Centre
DOOSAN PUMA 700LM

CNC Lathe
SPINNER TC 800-110-MCY

CNC Machining Centre
HAAS VF-8

CNC Machining Centre
QUASER MV 184 P

Mechanical Manufacture - Maintenance and Repairs

Machining Heat Exchanger Cap

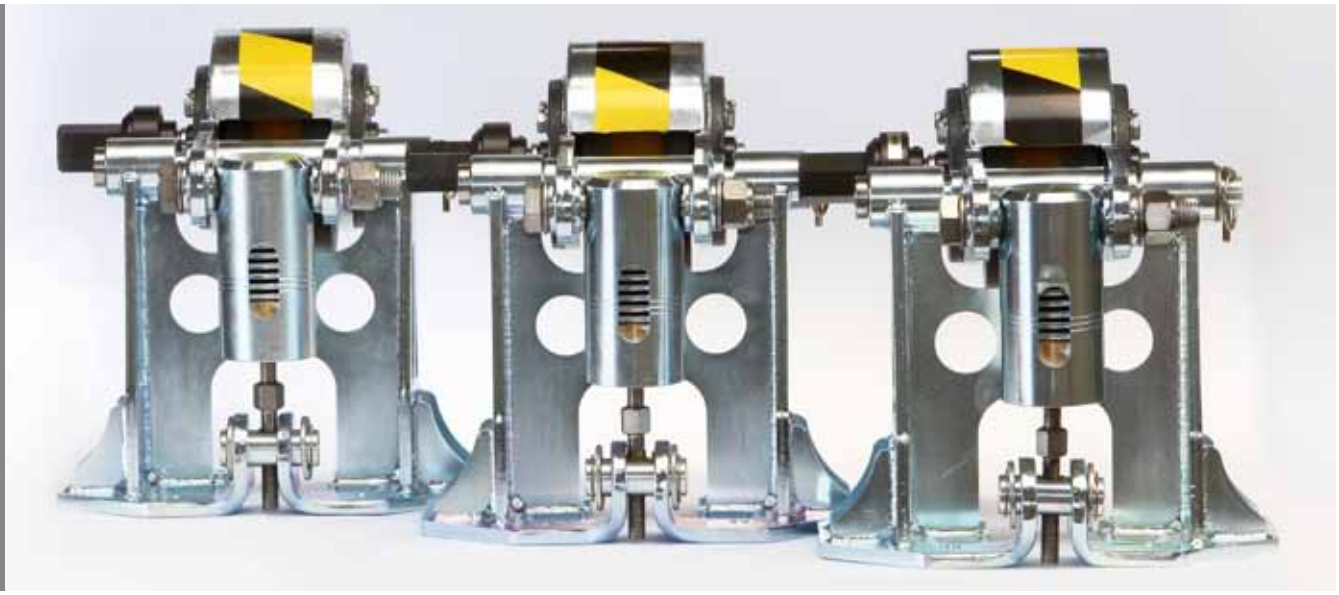
Laser Surface Cladding Rotor Shaft

Machining Flange Calciner

Repair Airtrax-Drive

Reference Components Mechanical Manufacture

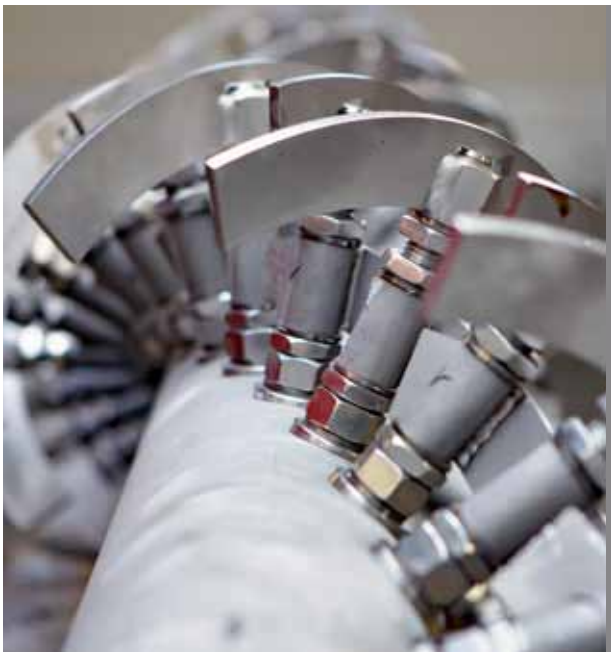
Turndrive Drivetrain



Rudder Cap

Flush Pipe Cable Layer

Flow Divider



Mixing Shaft

Reference Components Mechanical Manufacture

Flange machining cooling drum

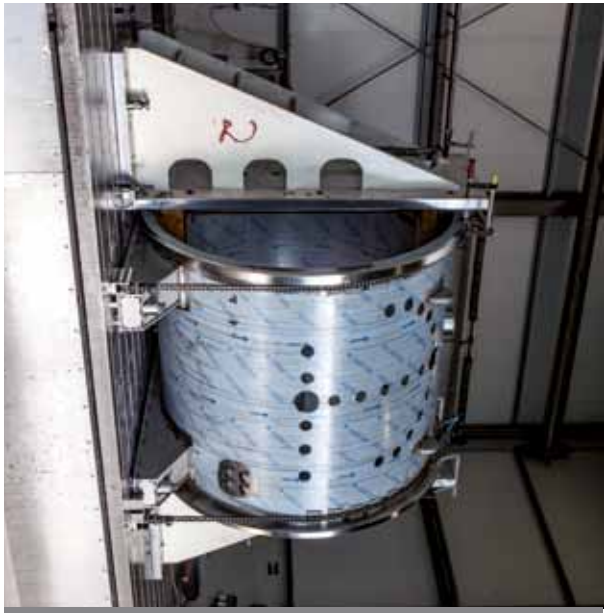
Clevis for Wing Test Rig

Centrifugal sieve drum

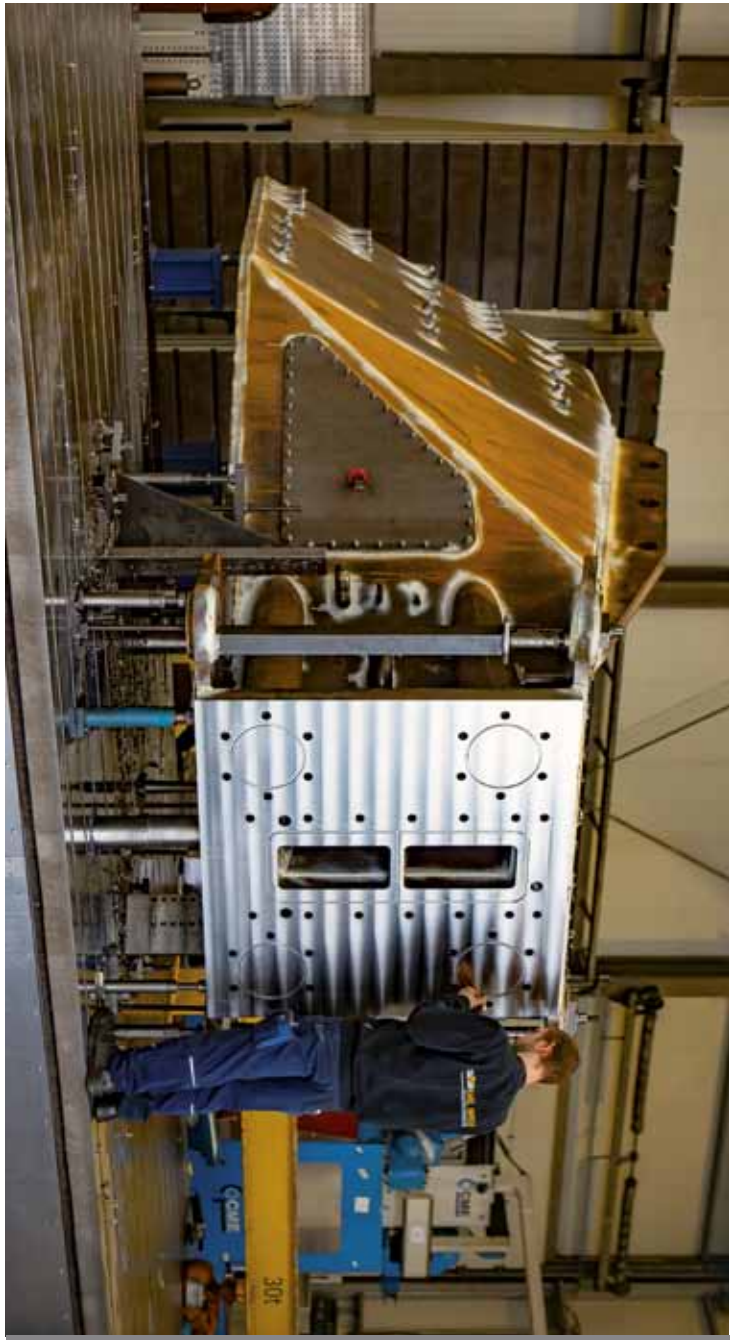
Rotor shaft clamp

Base plate container manufacture

Base plate (cable layer)



Machining of flange and surface of vacuum chamber



Rock saw sled (cable layer)

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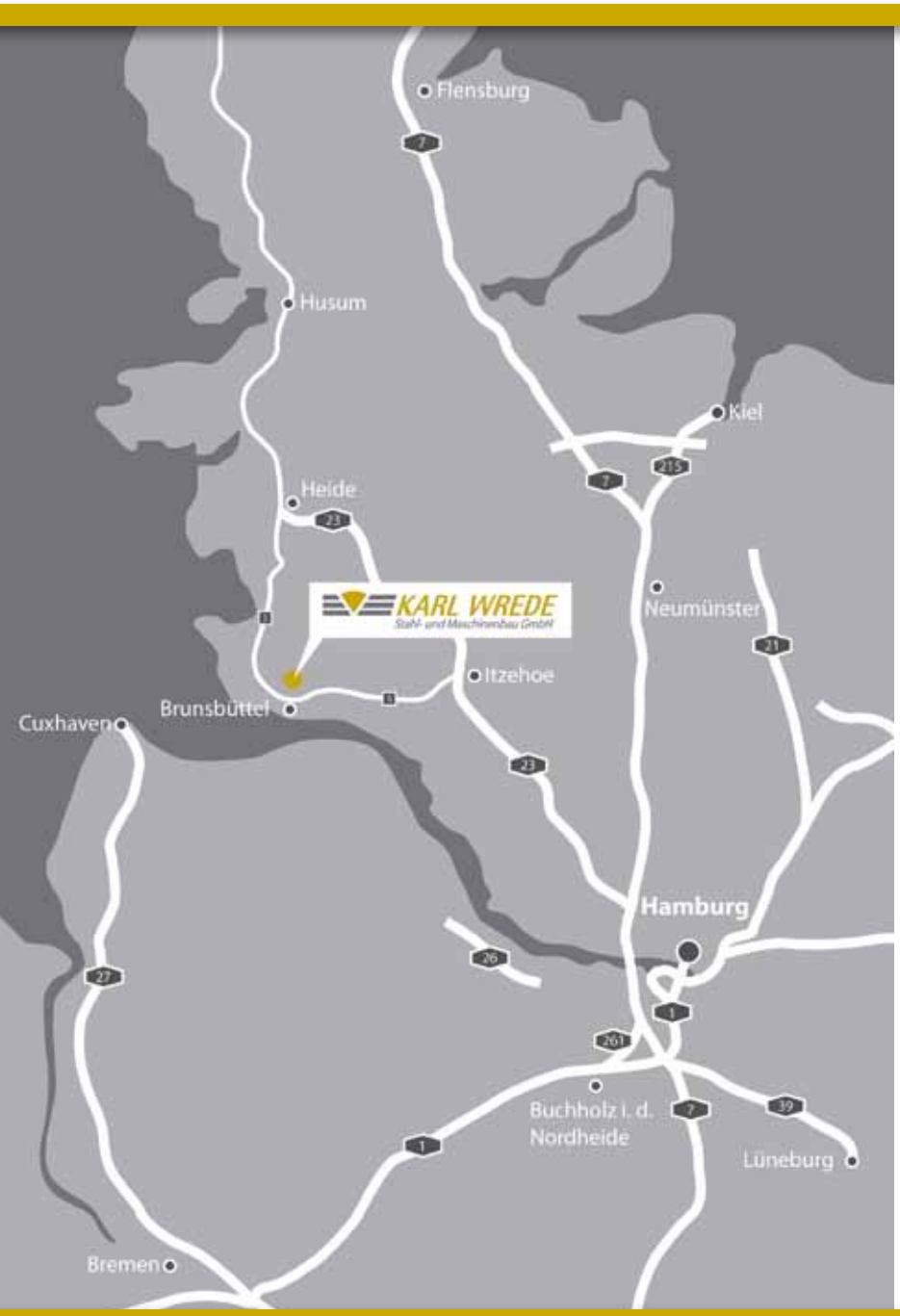
Design | Calculation | Manufacture

Complete One-stop Solutions



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