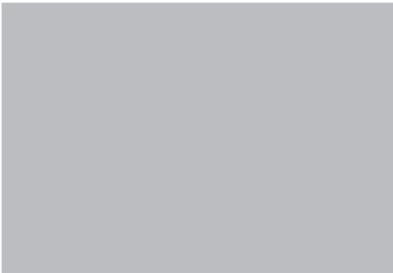
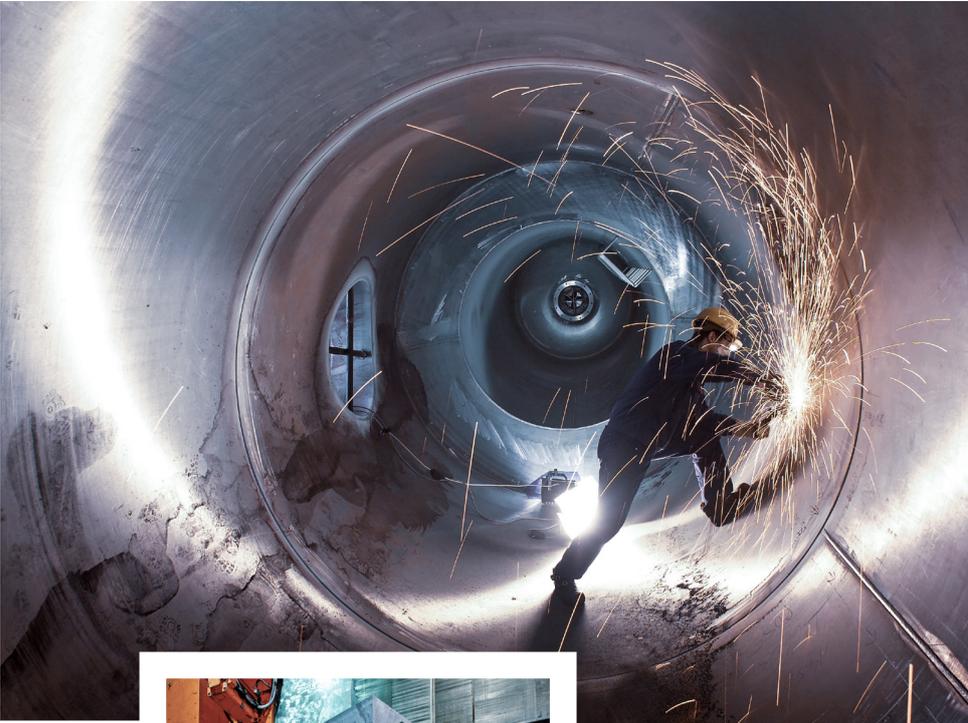
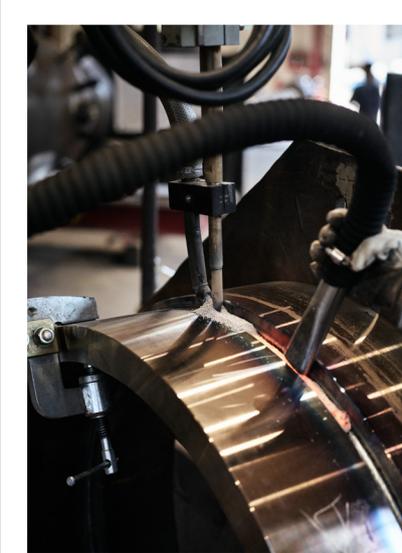


Christof Group

trust in solutions



critical
process
equipment

Christof Holding AG

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World's leading specialist in critical process equipment



"Our aim is to fabricate the most durable critical process equipment. Therefore, we will continuously deepen our skills and knowledge and tap into the unused potential of innovative highly resistant materials and novel production techniques."

Stefan Christof, CEO

More than 100 years of experience, first-class quality and an intimate knowledge of industrial process technologies and materials. Christof Group innovates smart, customized and future-proof equipment solutions which meet and exceed the highest international quality standards at the heart of every plant.

Christof Group's operations ACE, ACE Metalna, APB and SBN set the pace in the fertilizer, polymer, oil and gas, pharmaceutical, chemical and energy industries. Their high levels of specialization, quality workmanship as well as sophisticated production and welding techniques warrant reliable, safe and eco-friendly solutions for highly corrosive and critical media – solutions that are trusted all over the world.

This expertise, a track record of about 3,500 projects, proven troubleshooter skills and successful repairs of the "unrepairable" make the family-run business the first choice when it comes to critical process equipment.

Solid footing

1966

Established in

5

Production facilities

>95%

Export ratio

>100

Total countries supplied

3,500

International projects

>440,000

Annual production hours

145,310 m²

Total size of production area

trust in solutions

A mission. A goal. A promise.

"We pool our technological expertise and think outside the box to meet our clients' needs with speed, quality and reliability. Our goal is to install new and smart solutions at the heart of tomorrow's industrial plants. Solutions which reduce complexities and costs, minimize risks, provide long-term investment security and maximize plant productivity. Solutions which go beyond quality. This is what we understand as solutions our clients can trust."

Stefan Christof, CEO

More quality. More safety.



More protection.

Our clients deal with critical media at high pressure and at times, with high temperatures. We meet them at eye level with decades of technological expertise, an intimate knowledge of processes and an uncompromising commitment to quality. We deliver the high-end durable equipment they need.

That way, we help prevent safety incidents, leakages and environmental pollution. This limits downtimes and helps our clients optimize process efficiency, lower the environmental footprint and extend the lifespan of their plants. This helps us gain and maintain the trust of clients and partners. Worldwide.

More fair play.

Quality and reliability, honesty and respect, transparency and trust. Our values have shaped our family-run business since 1966. As a global player, we act responsibly. We treat each other, our suppliers, partners and customers with respect, equally and fairly. Our business conduct is based on high ethical standards, fair and sustainable competition. In our working environment we take care to ensure safe and healthy operations.

Responsibility for the environment is an equally important guiding principle. We use our resources sparingly and efficiently, especially water and energy. To reduce our ecological footprint, we optimize our technical production

processes, reuse and recycle metal as well as material waste and operate a fleet of e-cars. Switching to LED lighting has already saved several tons of CO₂.

We aim to create sustainable win-win outcomes – for the people we engage with, the environment and for us.

Markets & industries

With its five production facilities and an export ratio of more than 95% Christof Group serves clients worldwide – whether in China, Russia, India, the Middle East, Canada or USA. For production plant companies active in the oil and gas, fertilizer, chemical, polymer, pharmaceutical and energy sectors the global player is the first choice when it comes to critical process equipment.



Oil & Gas



Energy



Plastics



Nitrogen



Chemicals



Iron & Steel



Pharma



Paper

Special materials

Highly resistant in harsh environments

Christof Group is renowned for its unsurpassed knowledge of highly resistant materials needed for critical media.



General

- ▶ Unalloyed vessel plates
- ▶ High-alloyed, heat- and scale-resistant steels
- ▶ Rust- and acid-proof steels
- ▶ Ni-steels with high low-temperature strength
- ▶ High-strength fine grained steels



Non-ferrous metals and alloys

- ▶ Nickel and high Ni-alloys
- ▶ Copper-nickel alloys
- ▶ Titanium and Ti-alloys
- ▶ Hastelloy, Inconell
- ▶ Tantalum, Monel
- ▶ Copper, Aluminium



Cladded steels

- ▶ Roll-cladded
- ▶ Explosive-cladded
- ▶ Weld-cladded

H2S resistant materials

- ▶ Dicrest 5



Special qualities

- ▶ Duplex 1.4462
- ▶ Superduplex 1.4410
- ▶ Hyperduplex SAF2707HD®
- ▶ Urea grades
 - ▶ SAFUREX®
 - ▶ SAFUREX® Star
 - ▶ SAFUREX® Degree
- ▶ A610 / DIN 1.4361

Techniques

Quality and durability

Sophisticated welding and production techniques coupled with precision workmanship ensure high-quality results and durability.

Cladding

explosion and roll cladding, strip cladding and overlays

Digital X-Rays

groundbreaking accuracy saves time and money, view test images in the cloud

Equipment Modernization

energy-efficient heat transfer and heat exchange technologies for refineries, chemical and fertilizer industries

Equipment Optimization

state-of-the-art designs for HP equipment for the fertilizer and petrochemical industries

Inner Bore Welding

no leakages thanks to gap-free connections

Multilayer Designs

more safety, strength and stability for pressure vessel shells

Services

Christof Group teams act in sync to provide a full range of high-quality services and guarantee utmost reliability and a punctual delivery.

Engineering

mechanical, thermal and detail engineering, design calculations, 3D modelling

Inspections

to assess the remaining lifetime of the main equipment and limit downtimes

Revamps

to modernize or modify equipment, boost efficiency and productivity levels or lower the environmental footprint

Supervision

of on-site installations of critical and high-pressure equipment

Maintenance

services during shutdowns, ensuring smooth and optimized plant operations

Relining

to ensure the required corrosion protection

Repairs

employing specialized and unique approaches, even when repairing the most severe damages

Mechanical processing

of parts, components and equipment

Spare parts

production of customized parts in own workshops

Logistics

and worldwide transport planning, ensuring a quick and cost-optimized delivery



ACE

With ACE as a world market leader, Christof Group spearheads the supply and installation of tailor-made solutions and reliable critical process equipment needed at the heart of polymer plants. More than 100 years of experience in manufacturing as well as numerous innovative solutions for the oil and gas sector and the pharmaceutical industry have added to ACE's excellent reputation.

Highlights

- ▶ Special reactors for the polymer industry, equipment with static and dynamic internals for all temperatures and pressure levels
- ▶ Customized polymer pilot plants
- ▶ Columns, heat exchangers, air coolers, FCC components and other pressure equipment for the oil and gas industry as well as complete solutions including the required internals, attachments, calculations and installations
- ▶ Special electropolished pressure vessels required by the pharmaceutical industry
- ▶ Development of energy-efficient heat transfer and heat exchange technologies for refineries, chemical and fertilizer industries
- ▶ Processing of high-alloyed steels and special materials, e.g. titanium, Hastelloy, Monel, 1.4466 or special alloys (59, 600, 800, etc.) as well as special surface treatments
- ▶ Use of roll clad and explosion clad steel from trusted partners and reliable suppliers
- ▶ Customized weld overlays of vessels and parts

Facts & figures

Total equipment delivered	> 3,000
Total countries supplied	> 50
Longest/Heaviest equipment	Polymer Reactors: ø 5,100 mm; length: 32,500 mm; weight: 205 mt; Columns: ø 4,900 x 54,000 mm; weight: 190 mt; Heat Exchangers: ø 3,250 mm, length: 23,000 mm; weight: 195 mt;
Shortest delivery time	1 week for retubing a Heat Exchanger
Special materials handled	378 mt of alloyed steels 59, 600 and 800 in the last 10 years; In total 34,000 mt material in the last 10 years
Size of production area	44,480 m ²
Annual production hours	> 160,000 h

Reference products



Column

Type of Plant / Applications

Aromatics Light
Refinery

Standard

AD 2000

Materials used

1.0425

Dimensions / Weight

ø 2,000 x 42,500 mm
60,000 kg

Special Features

Delivery in one piece, 60 pieces of internal support rings

Alternatives / other specification

Columns can also be fabricated in other dimensions, materials and according to other standards, such as ASME Sect. VIII Div. 1.; Columns can be delivered with platform, ladders, internals and other attachments.



Polymer Reactor

Type of Plant / Applications

PBT (Polymer)
PBT, PC, PE, PET, PP, PS

Standard

AD 2000

Materials used

1.0425 & 1.4541; 1.0425; 1.4541

Dimensions / Weight

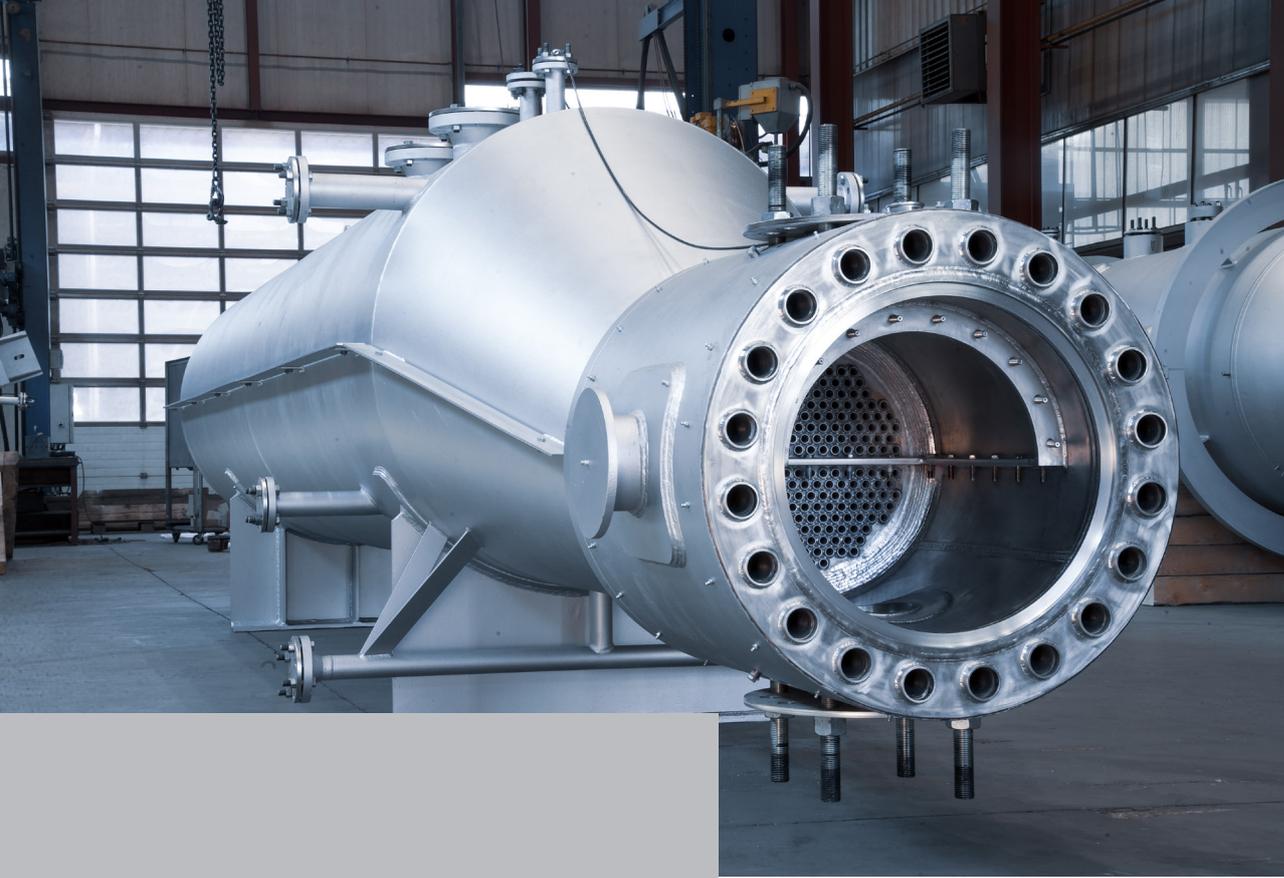
ø 3,500 x 11,500 mm
92,000 kg

Special Features

Roll clad material; rotating internals; heating jacket; inner surface grinded; in-house heating and vacuum test

Alternatives / other specification

Reactor can also be fabricated in other dimensions, materials and according to other standards, such as ASME Sect. VIII Div. 1.



APB

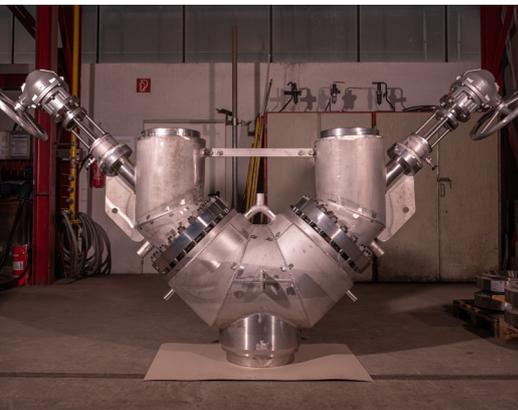
Nitric acid equipment, melamine reactors, polymer valves and piping – with APB, Christof Group provides top-quality critical process equipment for the chemical and petrochemical sectors. The specialist for welding high-alloyed steels often tackles the most complex challenges and toughest conditions during maintenance services and revamps on-site.

Highlights

- ▶ Specialized production of equipment for high-concentrated nitric acid, high-quality pressure vessels as well as a leading manufacturer of critical melamine equipment
- ▶ Special valves and high-pressure piping for polymer distribution
- ▶ High-pressure piping for use in the energy sector and the ammonia synthesis process
- ▶ High-pressure pipes up to 500 bar for polymer plants
- ▶ Weld overlays and strip cladding of pressure parts made of nickel-based alloys as well as hardfacing of parts that are subject to wear and tear

Total equipment delivered	> 1,450
Total countries supplied	23
Longest/Heaviest equipment	Reactor: ø 4.5 m, 42 m long, weighing 240 mt
Shortest delivery time	1 h Emergency Call
Special materials handled	Titanium grade 2, 1.4361
Size of production area	4,490 m ²
Annual production hours	> 50,000 h

Reference products



Polymer Bottom Outlet Valve

Type of Plant / Applications

Nylon
Polyethylenterephthalat (PET)

Standard

AD 2000

Materials used

1.4541/1.4301

Dimensions / Weight

DN 400 mm
1,650 kg

Test-Pressure

39.5 bar

Special Features

Heating jacket; inner surface grinded

Alternatives / other specification

Valves are also fabricated in other dimensions, materials and standards



Skid Unit for Ethanol Dehydration

Type of Plant / Applications

Refinery
Ethanol

Standard

PED 97/23/EC, ASME VIII Div. 1

Materials used

AISI 304L

Dimensions

2,400 x 3,500 x 9,000 mm

Special Features

Heating jacket; inner surface grinded

Alternatives / other specification

Complete manufacturing of the skid including testing of I&C equipment in in-house workshop



SBN

With SBN as a world market leader, Christof Group manufactures high-quality pressure equipment for urea and ammonia synthesis as well as high-quality critical equipment for the fertilizer, chemical and petrochemical industries. More than 200 high-quality heat exchangers and reactors delivered for urea and ammonia synthesis since 2000 have placed SBN at the helm of the fertilizer industry.

Highlights

- ▶ The latest generation of critical process equipment for urea and ammonia plants for maximum productivity, reduced project risks and long-term investment security
- ▶ Technologically advanced high-pressure equipment for the fertilizer and petrochemical industries
- ▶ Pioneer in the extensive use of Safurex® and strategic partner of Stamicarbon
- ▶ First high-pressure stripper fabricated out of the brand new Safurex® Star and Safurex® Degree materials
- ▶ Complex and highly specialized repairs, using innovative methods – even when repairing the most severe damages
- ▶ Inner bore welding to ensure gap-free connections and prevent leakages in highly corrosive environments
- ▶ Multilayer designs add safety, strength and stability to pressure vessel shells, while reducing both weight and costs
- ▶ Introduction of digital X-ray testing to test welding seams – an accurate time and money saving method, complete with test images in the cloud and digital project documentation

Total equipment delivered	> 400 since 1970
Total countries supplied	46 since 1970
Longest/Heaviest equipment	Pool Reactor with 450 mt
Shortest delivery time	6 months for an HP Scrubber
Special materials handled	400 mt Safurex® and 50 mt 25.22.2 within 1 year
Size of production area	24,490 m ²
Annual production hours	> 180,000 h

Reference products



High-Pressure Stripper

Type of Plant / Applications
Urea Plant / Urea

Dimensions / Weight
ø 3,750 x 14,300 mm / 227,000 kg

Standard
AD 2000 Regulations

Special features
5,100 heat exchanger tubes; multilayer design for high pressure channels; leak detection system for lined parts

Materials used
All wetted parts (tubes, overlay welding, lining and internals) made of Safurex®. High-pressure channel multilayer made of high-strength carbon steel 1.8935 (Naxtra 70) with carbon steel 1.0565 (P355NH) as core shell; other pressure bearing parts are made of solid carbon steel material.

Alternatives / other specification
Can be designed and manufactured according to all relevant pressure vessel codes and standards (e.g. ASME VIII DIV 1 or 2, AD 2000). Upon client request, the high-pressure channel can be also built in monowall design and all pressure bearing parts (tubesheets etc.) can be made of repair-friendly P1 carbon steel material.

Techniques / Licensor
Stamicarbon bv, Nederlande



Waste Heat Boiler

Type of Plant / Applications
Ammonia Plant / Ammonia

Dimensions / Weight
ø 1,750 x 12,500 mm / 60,000 kg

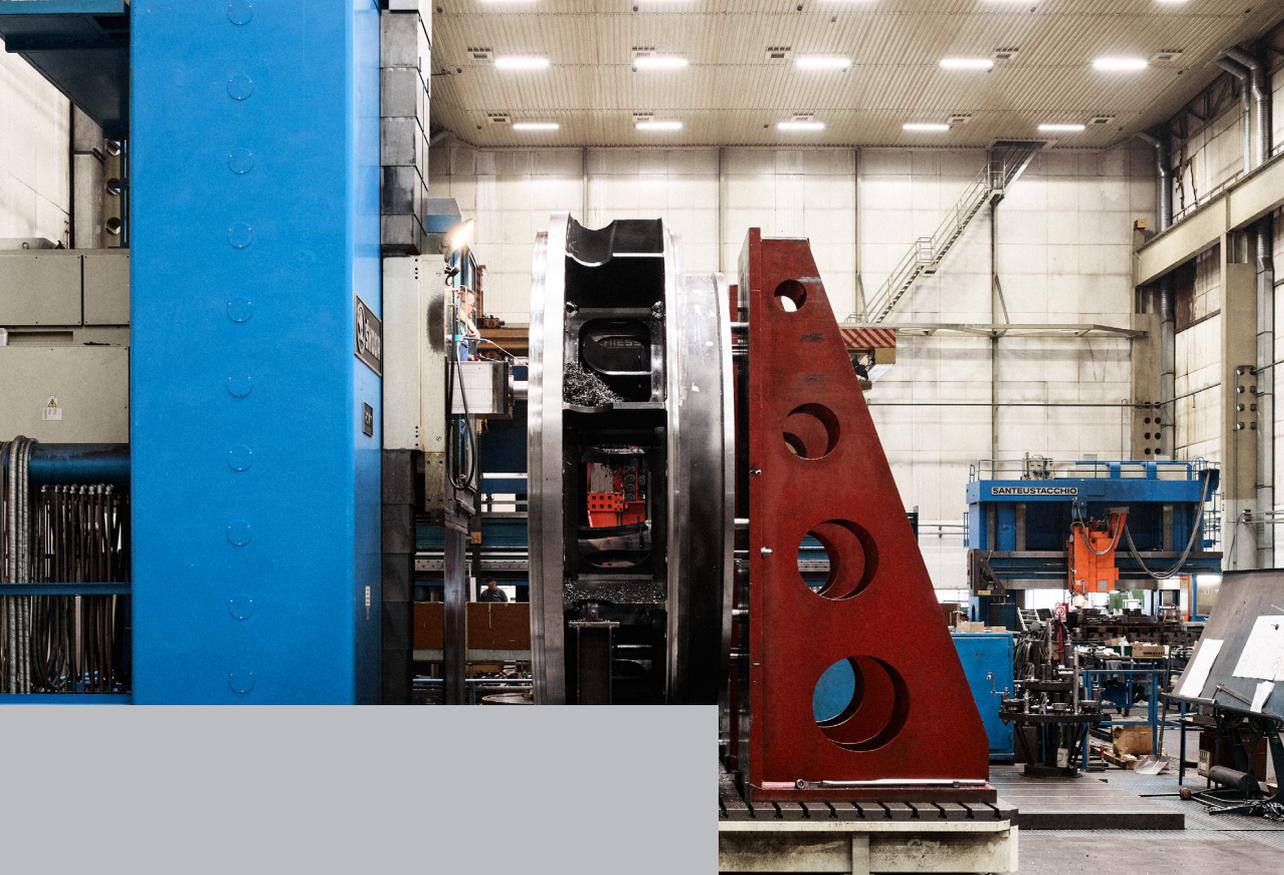
Standard
ASME VIII Div 2

Special features
380 U-tubes welded, using the inner bore welding technique; overlay welding on tubesheet

Materials used
Cr-Mo Steel (F22) for high temperature and high-pressure hydrogen service

Alternatives / other specification
Can be designed and manufactured according to all relevant pressure vessel codes and standards (e.g. AD 2000, EN 13445, PED, TR CU 032/2013, TSG 21-2016)

Techniques / Licensor
TKIS



ACE METALNA

Christof Group's machining specialist ACE METALNA is the preferred partner for machining large components for the steel and machine-building industries and pressure vessel manufacturers. Proven quality and high-tech CNC machinery guarantee maximum precision for special customized solutions and for workpieces with maximum dimensions.

Highlights

- ▶ Maximum turning diameter 7,000 mm
- ▶ Maximum component height during turning 4,000 mm
- ▶ Maximum workpiece length during milling 18,000 mm, and maximum widths of 5,500 mm
- ▶ Machining of components weighing up to 100 mt
- ▶ Precision workmanship and ISO 9001 quality assurance

Total equipment delivered	2,800
Total countries supplied	5
Longest/Heaviest equipment	25 m / 100 mt
Shortest delivery time	1 day
Size of production area	71,850 m ²
Annual production hours	> 50,000 h

Christof Group certificates

- Management System ISO 9001:2015
- Safety Certificate Contractors SCC**:2011
- Quality requirements for welding acc. to ISO 3864-2
- Components for steel structures acc. to EN 1090-2
- China Manufacture License - Pressure Vessels A1/A2
- Pressure Equipment Directive PED 14/68/EU
- AD2000 - Merkblatt HP0
- Pressure Equipment Act (BGBI. Nr. 161/2015) § 51 (3)
- National Board Certificate of Authorization to Register
- ASME U
- ASME U2
- ASME R-Stamp
- ASME UM
- ASME S
- HP0, TRD 201 (German welding license)
- Korea certificate
- PED A2
- Federal Water Act (WHG) §19 (Germany)

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