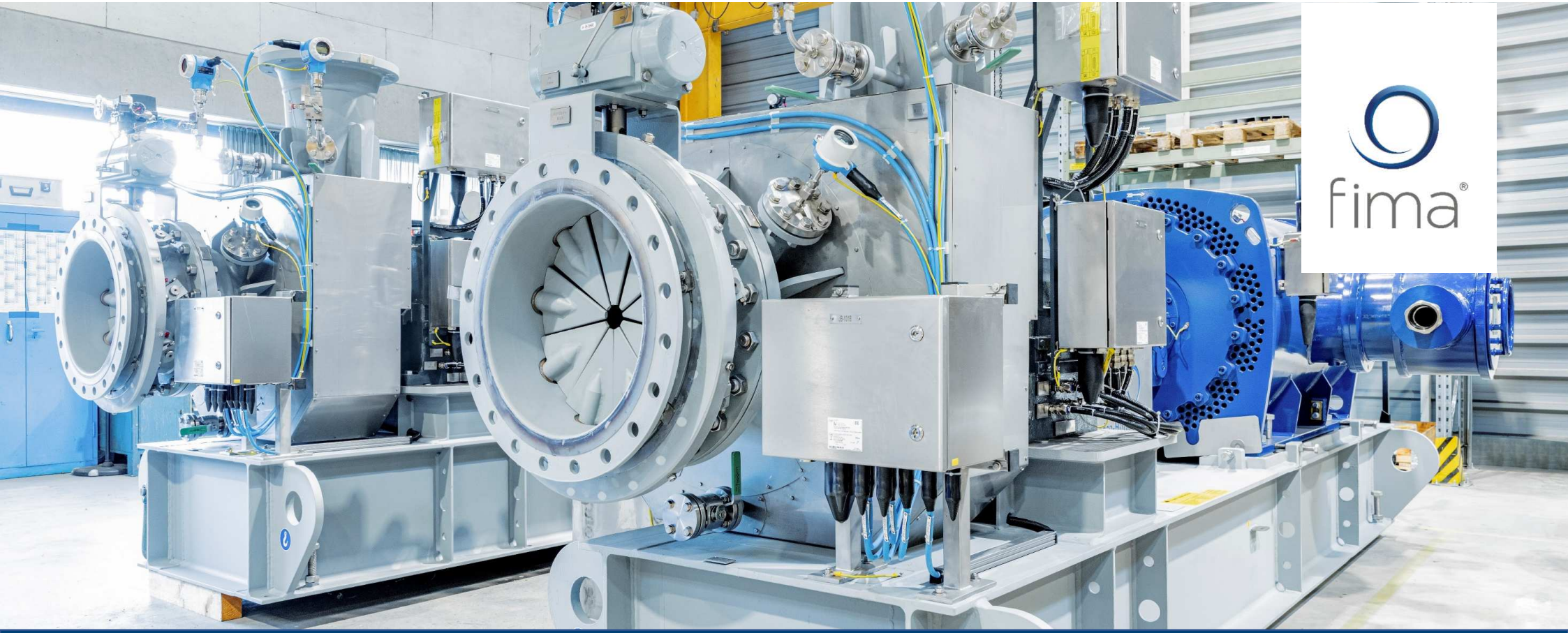


Company Profile

FIMA TURBO BLOWERS AND COMPRESSORS FOR PROCESS APPLICATIONS

OVER 75 YEARS OF EXPERIENCE

over 75 years 1946 - 2022

140 Employees
ensure the highest quality and approx. 250 satisfied customers (2022)

28.5 Mio € Order Income
in 2023

Approx. 25,000 Installed Machines
worldwide in various industries

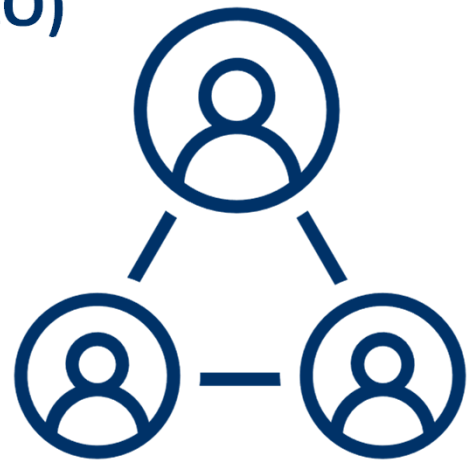
4 Locations
and an extensive network of representatives available to you

FIMA ORGANIZATION

Chief Executive Officer (CEO)

M. Hansen

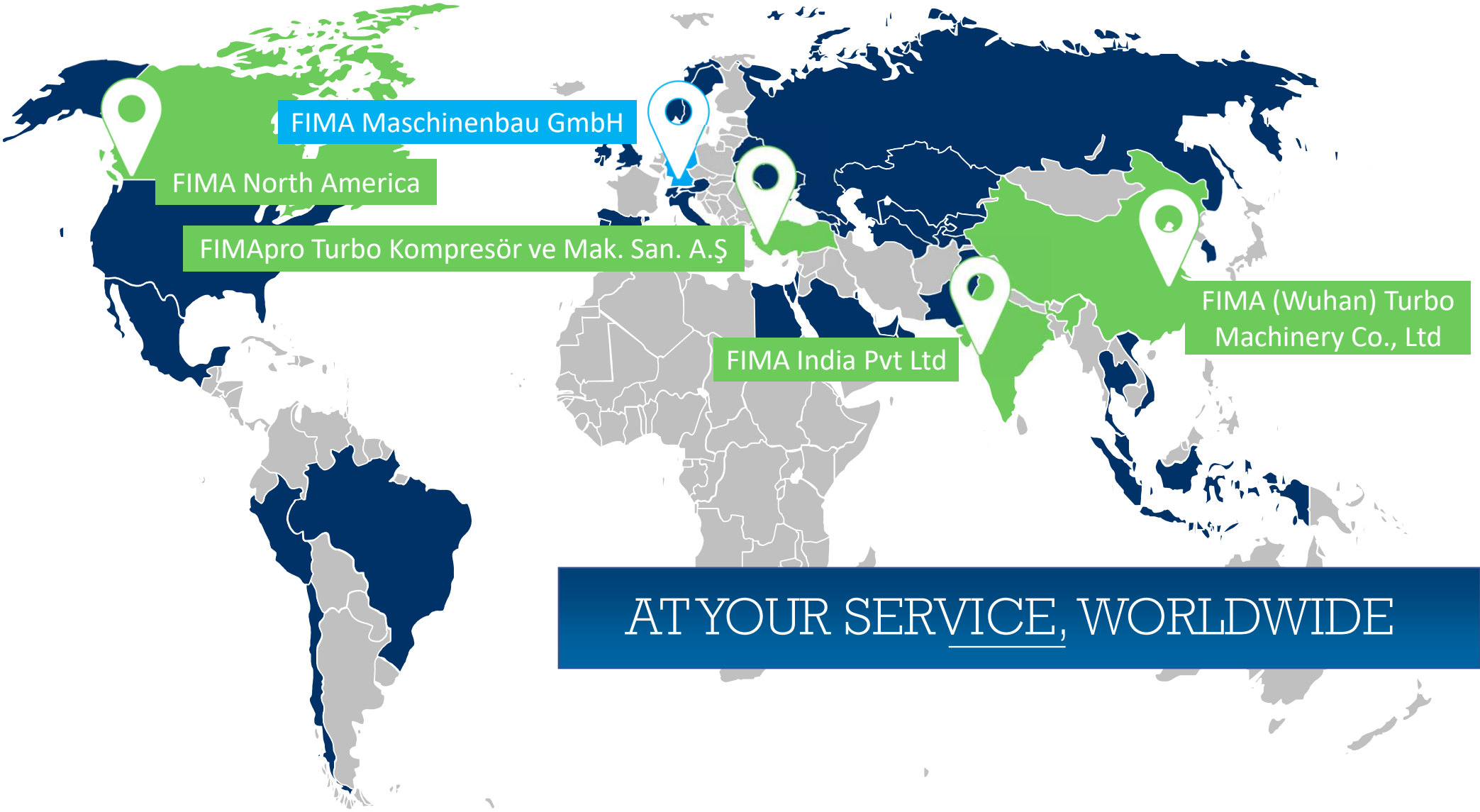
- Marketing
- Human Resources
- QEHS
- Finance & Controlling
- Sales
- FIMA India
- FIMA Wuhan



Chief Operating Officer (COO)

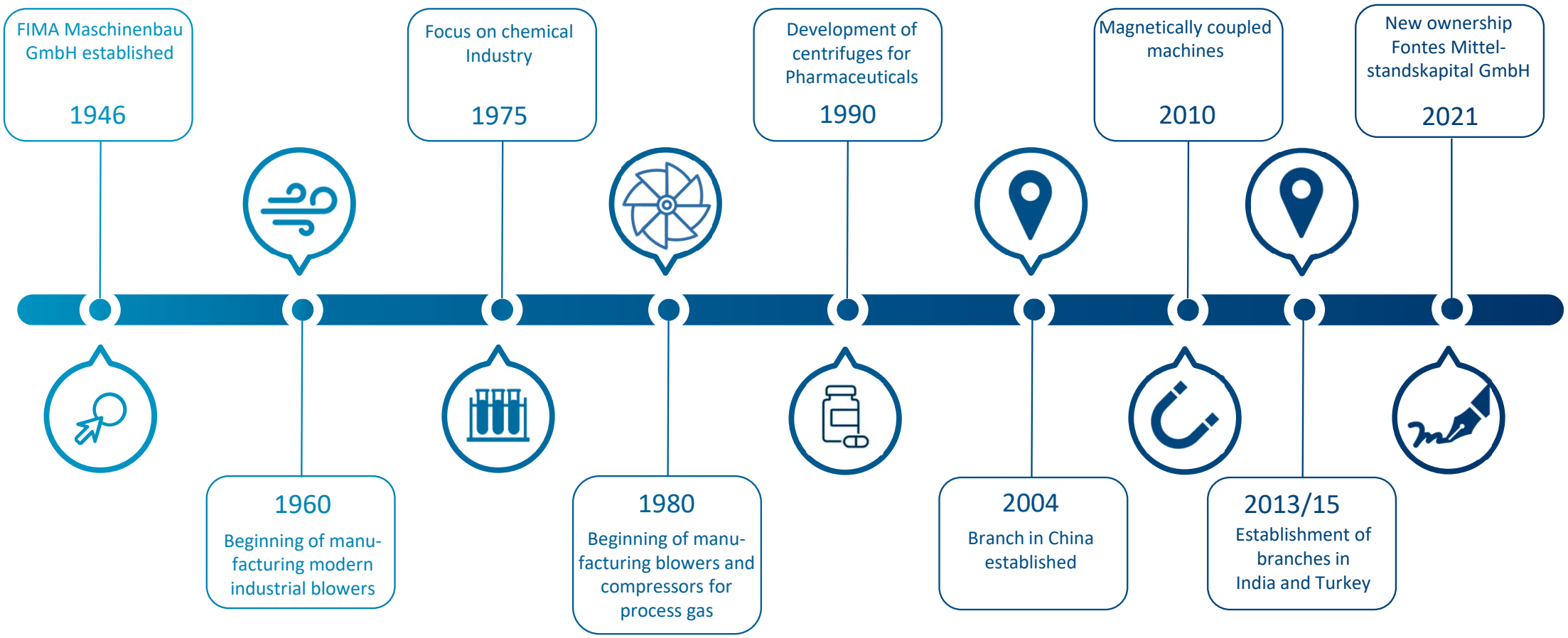
R. Dietz

- Manufacturing
- Engineering and R&D
- IT
- Operational Excellence & Project Management
- Service
- FIMA Pro


FIMA Maschinenbau GmbH
FIMA North America
FIMApro Turbo Kompresör ve Mak. San. A.Ş
FIMA India Pvt Ltd
FIMA (Wuhan) Turbo Machinery Co., Ltd
AT YOUR SERVICE, WORLDWIDE

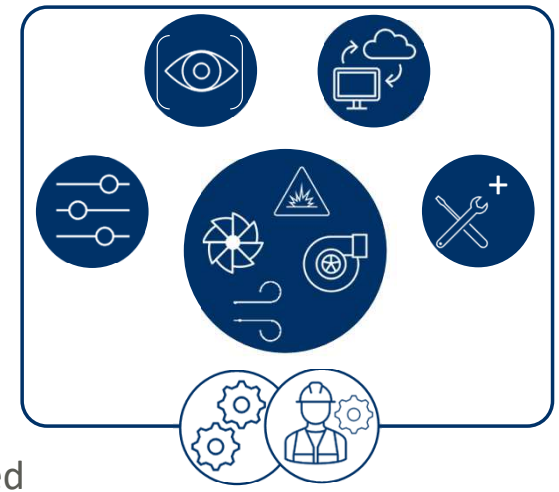
360° FOR YOUR SOLUTION

FROM HAY DRYERS TO PROCESS GAS COMPRSSORS

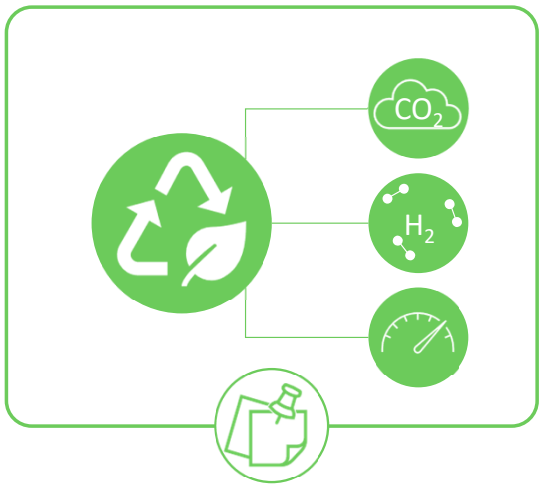


THE WAY TO SUSTAINABLE PROCESS SOLUTIONS

- Turbo Compressors
- Special Purpose Blowers
- Explosion Proof Blowers
- Hermetically Encapsulated Blowers and Compressors



Automation & Service



Research & Development

Customized Solutions

START

High-Tech and Engineered Solutions

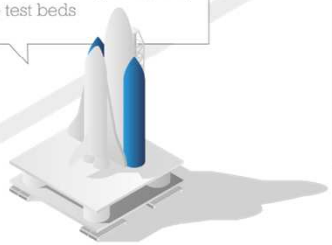
TODAY

Sustainable

FUTURE

YOUR APPLICATIONS – OUR SOLUTONS

Aerospace industry
- Thermal conditioning unit (TCU)
- Satellite test beds

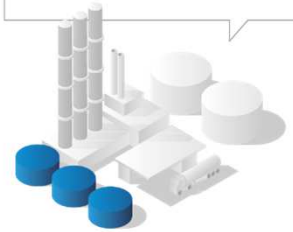


Chemical industry
- Polyamides (PA)
- Silica (MDI)
- Sulfuric acid
- Carbon black
- Acrylic acid

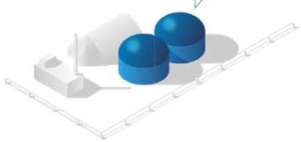
Food industry
- Mechanical vapor recompression (MVR)
- Industrial baking processes

Pharmaceutical industry
- Coating
- Fluidized bed drying
- Sterilization process

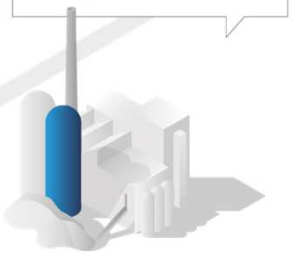
Refineries
- Continuous catalyst reforming (CCR)
- Propane dehydrogenation (PDH)
- Combustion air
- Reforming gas
- Sulfur recovery unit



Energy supply
- Seawater desalination
- Solar energy
- Power to x (e.g., ammonia)

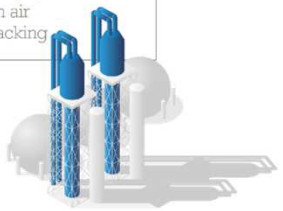


Iron and steel industry
- Acid recovery
- Coke oven gas
- Highly corrosive recycle gases
- Combustion air
- Air separation units

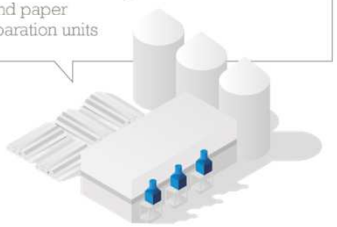


Oil and gas industry
- Offshore
- Boil-off gas (BOG)
- Liquefied natural gas (LNG)

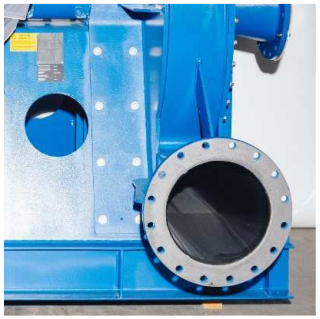
Petrochemical industry
- Polyolefins (PP, PE)
- Polycarbonates (PC)
- Polystyrenes (PS)
- Combustion air
- Naphtha cracking



Wood and plastics processing industry
- Mechanical vapor recompression (MVR)
- Laminate manufacturing
- Pulp and paper
- Air separation units



OUR PRODUCTS FOR A SUSTAINABLE WORLD

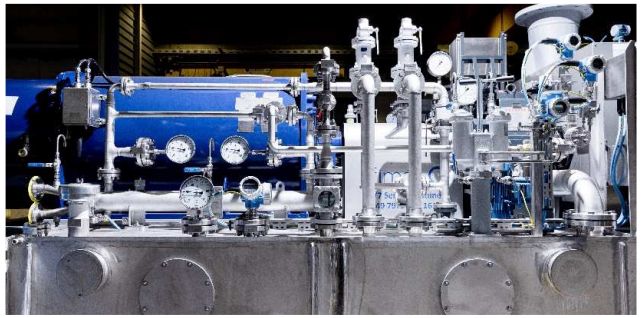



Turbo Compressors


Special Purpose Blowers

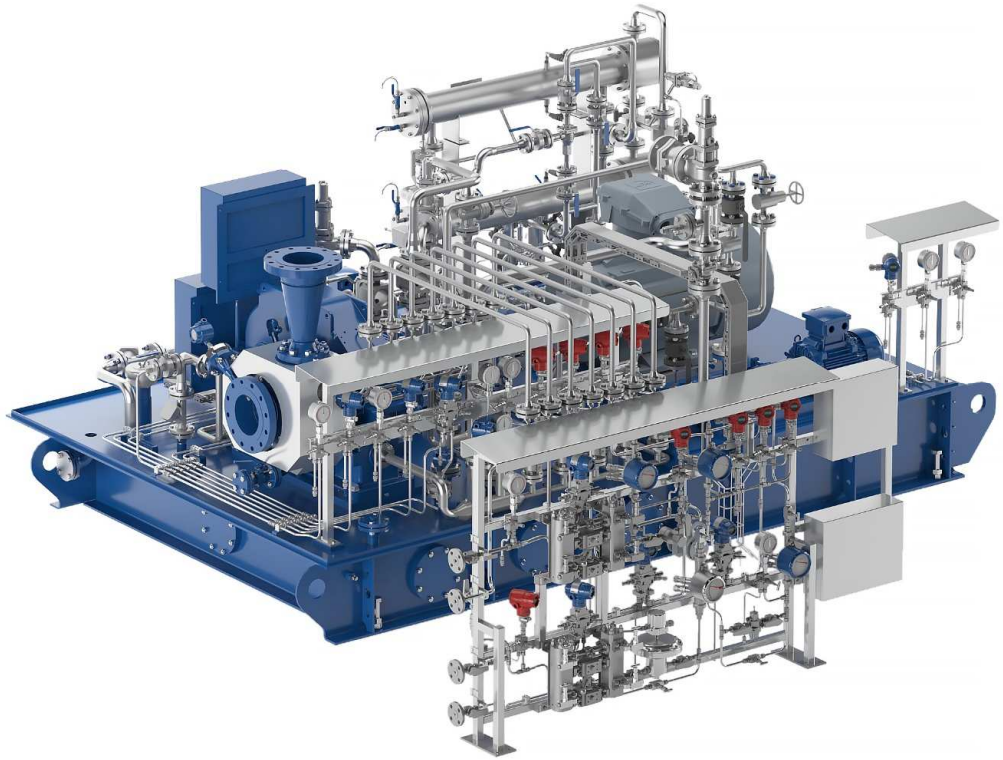


Explosion Proof Blowers

Hermetically Encapsulated Blowers and Compressors


TURBO COMPRESSORS

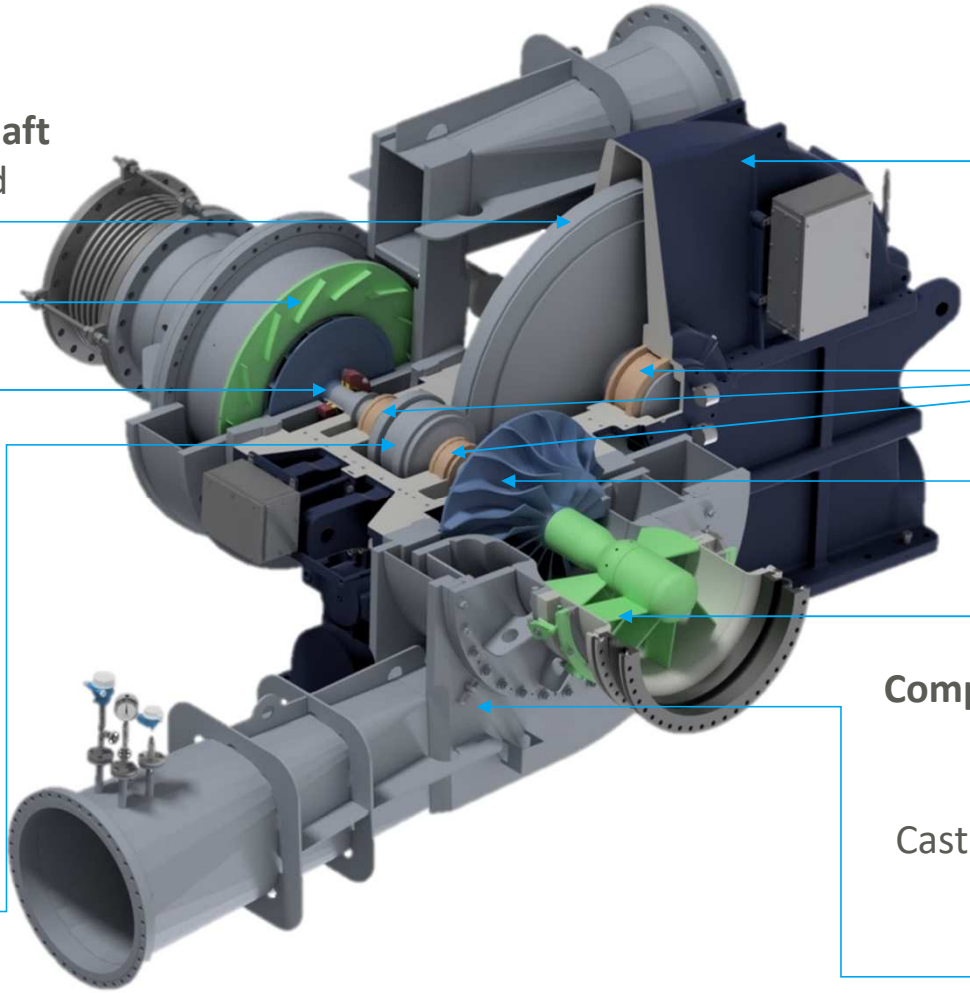


Flow Rate	**150 – 300,000 m³/h**
Maximum Pressure	**150 bar**
Pressure Ratio / Stage	up to **2.5**
Stages	up to **4**
Motor Power	up to **5.0 MW**

Benefits

- Maximum compressor efficiency and robustness
- Smart plug-in and modular design
- Individually selected for your process
- Wide operating range (75-105%)
- Compliance with codes and regulations including API 617, API 614, EAC Russia, CSA/CRN

KEY COMPONENTS – INTEGRALLY GEARED TECHNOLOGY



Gearbox Casing
Cast steel
Welded

Driving Shaft
Low speed

Diffusor
with or without vanes

Bearings
Tilting pad

Impeller
Open
Closed

Shaft Seal
Graphite
Labyrinth
Dry gas seal

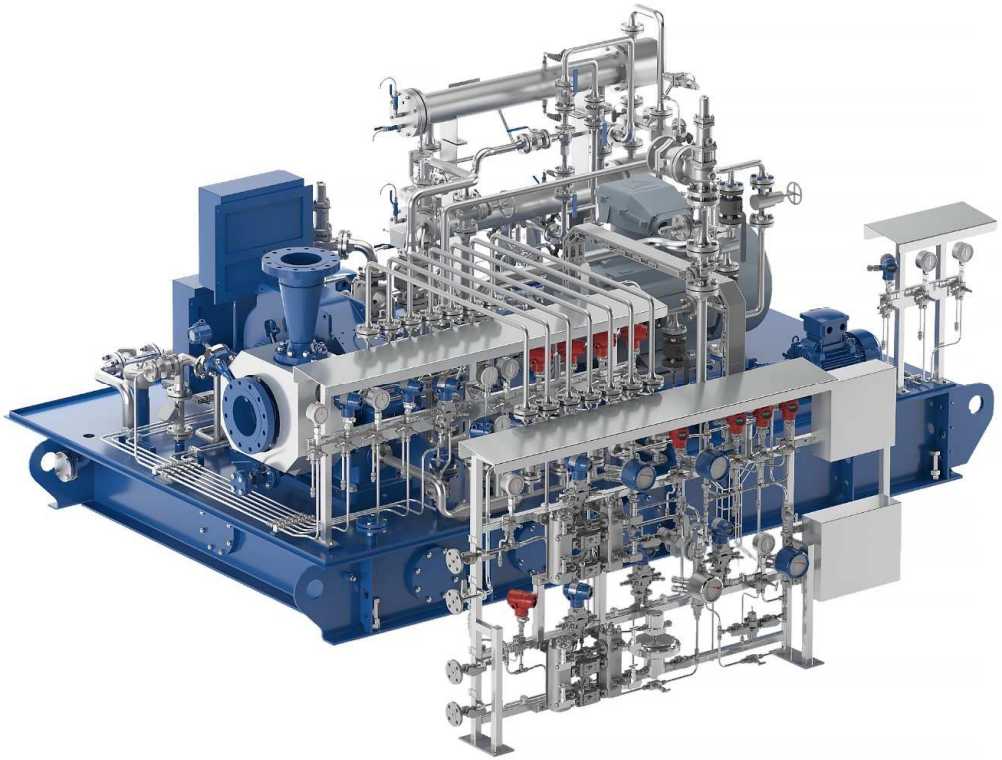
Inlet Guide Vanes
Machined

Driven Shaft
High speed with thrust collar or double-helical gearing

Compressor Casing
Cast iron
Cast steel
Cast stainless steel
Cast alloy
Welded

REFERENCE PROJECTS

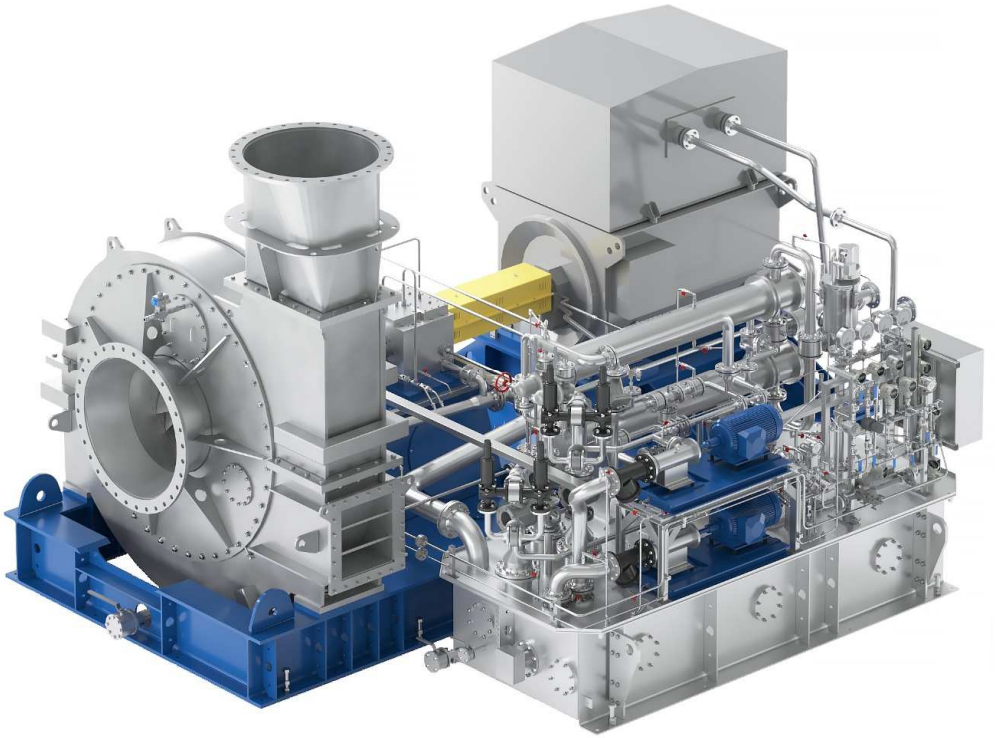
Quick Facts:



Client	ONGC / OPAL
Contractor	Tecnimont Italy
Application	Polyelefines (Polypropylene / Polyethylene – INEOS) acc. to API 617, Ch.3
Country	India
Machine type	4 PP-Recycle Gas-Compressors / 3 PE-Ejector-Booster-Compressors (API 617, Ch.3)
Year of production	2011
Winning factors	- High flexibility to comply with customer requirements - Best price - Good relationship to licensor - Large number of references

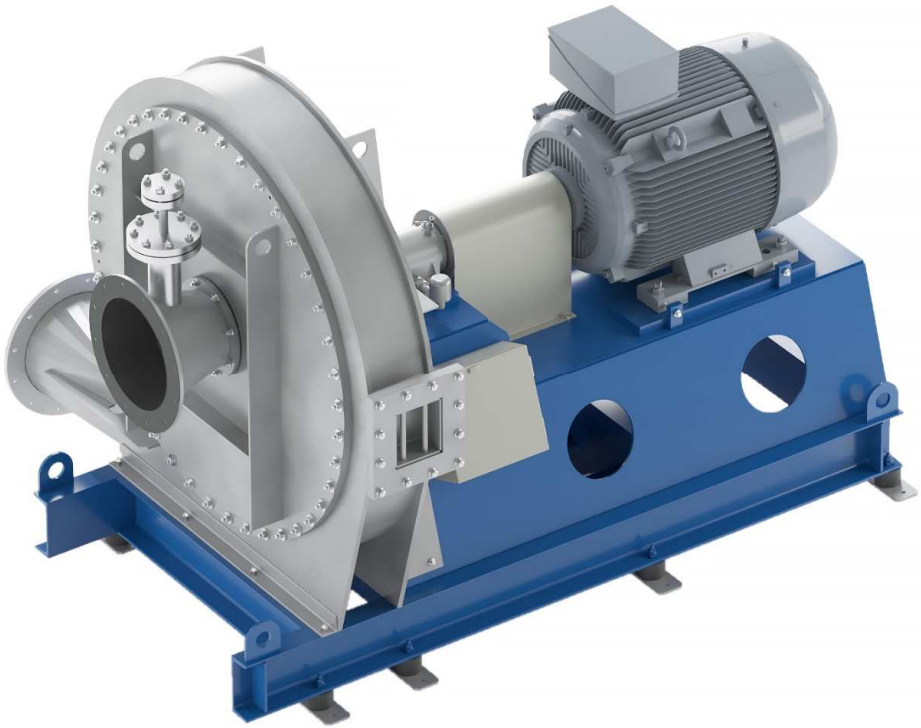
REFERENCE PROJECTS

Quick Facts:



Client	Yara
Contractor	without
Application	Sulphuric Acid Plant for Fertilizer Production
Country	Finland
Machine type	SO2 compressor (API 617, Ch.2)
Year of production	2013
Winning factors	- High flexibility to comply with customer requirements - Best technical solution (subcritical operation) - Special features (clean-in-place, polished impeller, etc.) - Good relationship to client (first contact in Brussels 2007)

SPECIAL PURPOSE BLOWERS

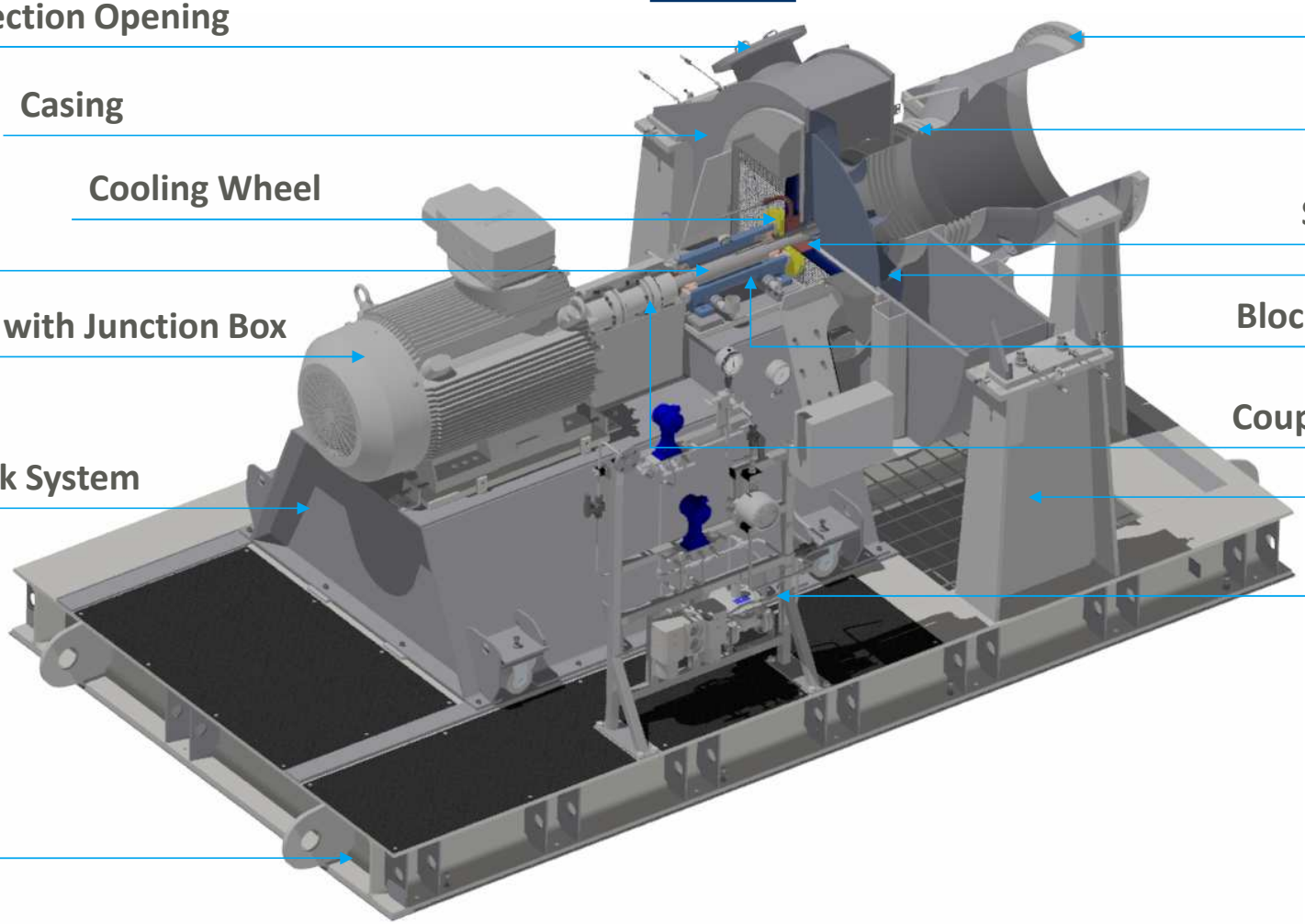


Volume Flow	**80 – 500,000 m³/h**
Maximum Pressure	**100 bar**
Pressure Ratio / Stage	up to **1.5**
Speed	up to **12,000 rpm**
Motor Power	up to **5.0 MW**

Benefits

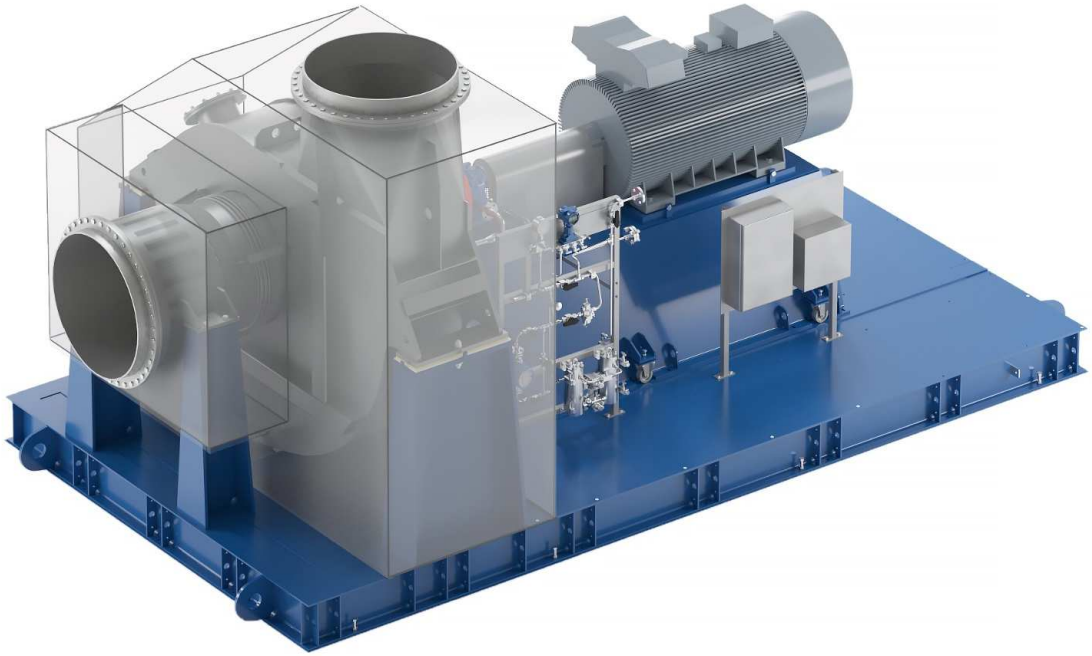
- Maximum blower efficiency and robustness
- Design-to-Process (customized solutions)
- Wide range of impeller types
- Wide range of special materials
- High-Speed and High-Pressure Designs
- Compliance with codes and regulations including API 673, EAC Russia, CSA/CRN

SPECIAL PURPOSE BLOWERS



REFERENCE PROJECTS

Quick Facts:



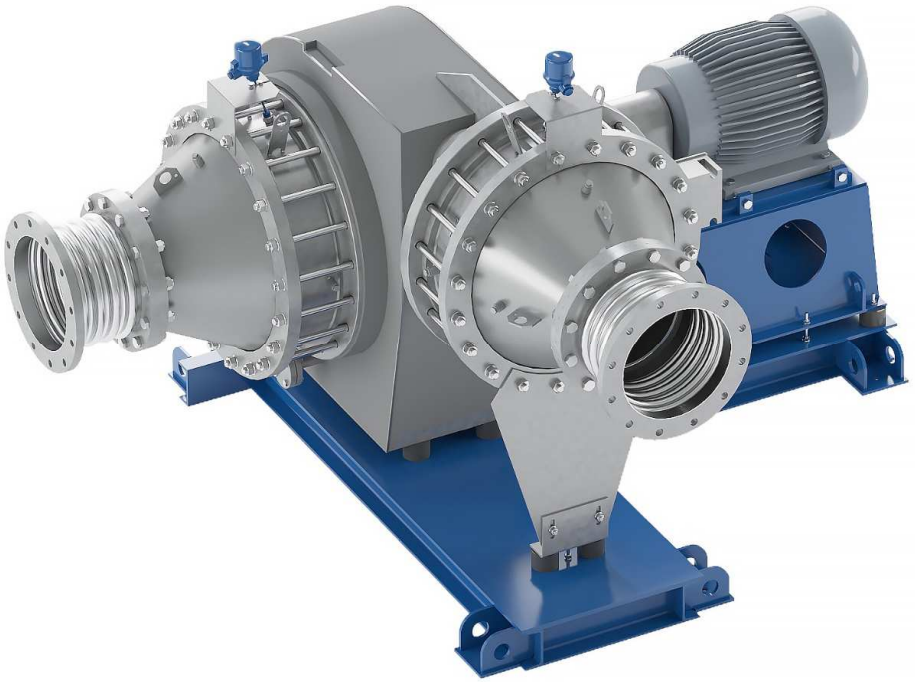
Client	Zhejiang Petroleum Chemical Co., Ltd (ZPC)
Contractor	China Huanqiu Contracting & Engineering Corp. (HQC) / Luoyang Petrochemical Engineering Corporation (LPEC) / SINOPEC
Application	UOP CCR PDH and Platforming Process
Country	China
Machine type	Regeneration Blower, Spent Catalyst Fines Removal Blower and Regeneration Catalyst Fines Removal Blower
Year of production	2017
Winning factors	- Reference Yan Tai Wanhua - Performance during technical meeting compared to competitors - Attractive Price Level

REFERENCE PROJECTS

Quick Facts:

Client	SADARA Chemical Company
Contractors	Daelim Korea, DOW USA, Fluor USA, Foster Wheeler UK, John Zink Germany, Graphite India
Application	Many different applications
Country	Saudi-Arabia
Machine type	More than 60 complete blower units, Power Range: from 10 HP to 2000 HP
Year of production	2014
Winning factors	- References for a lot of process - Recommended vendor of DOW - High flexibility to comply with customer requirements - Attractive price level

EXPLOSION PROOF BLOWERS

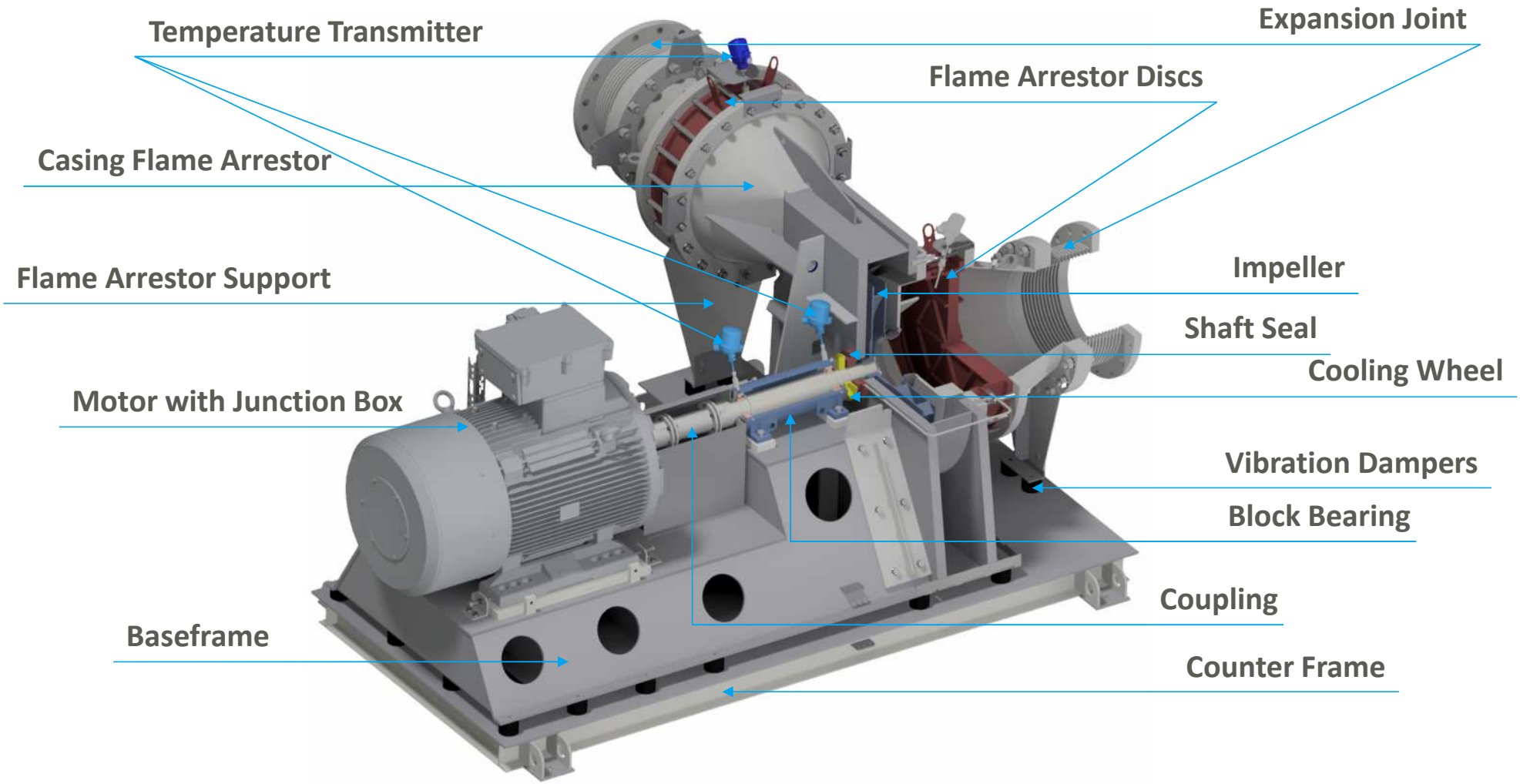


Volume Flow	**20 – 10,000 m³/h**
Suction Pressure	min. **800 mbar**
Discharge Pressure	max. **1.300 mbar**
Motor Power	up to **160 kW**
Pressure Increase	up to **300 mbar**

Benefits

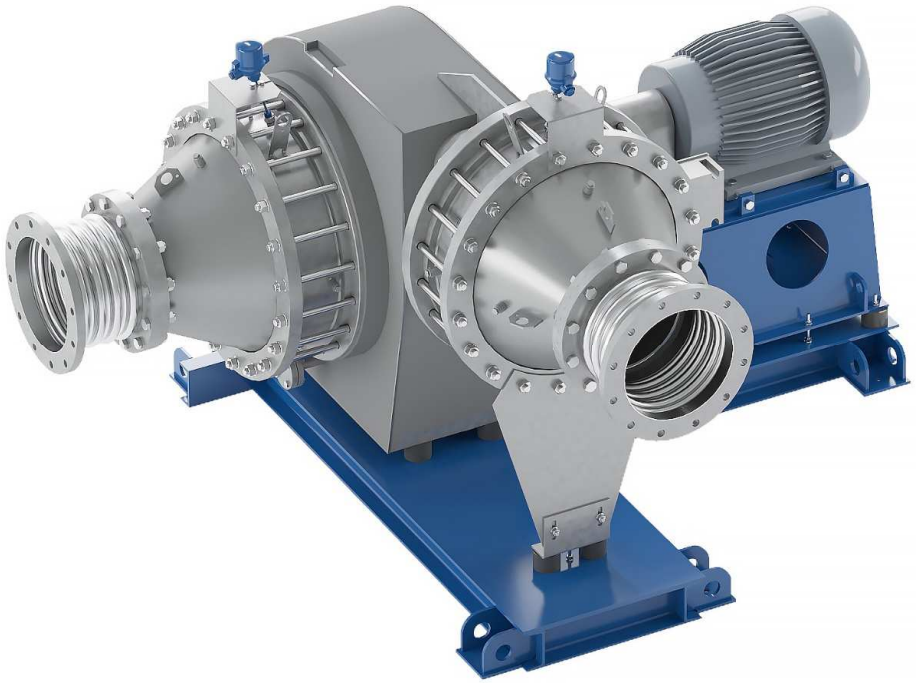
- Market leader for Zone-0 applications
- CAPEX & OPEX savings with our Zone-0 blowers
- Maximum blower efficiency and robustness
- Standardized design
- Type certifications for all gases and process conditions
- Wide range of special materials

EXPLOSION PROOF BLOWERS



REFERENCE PROJECTS

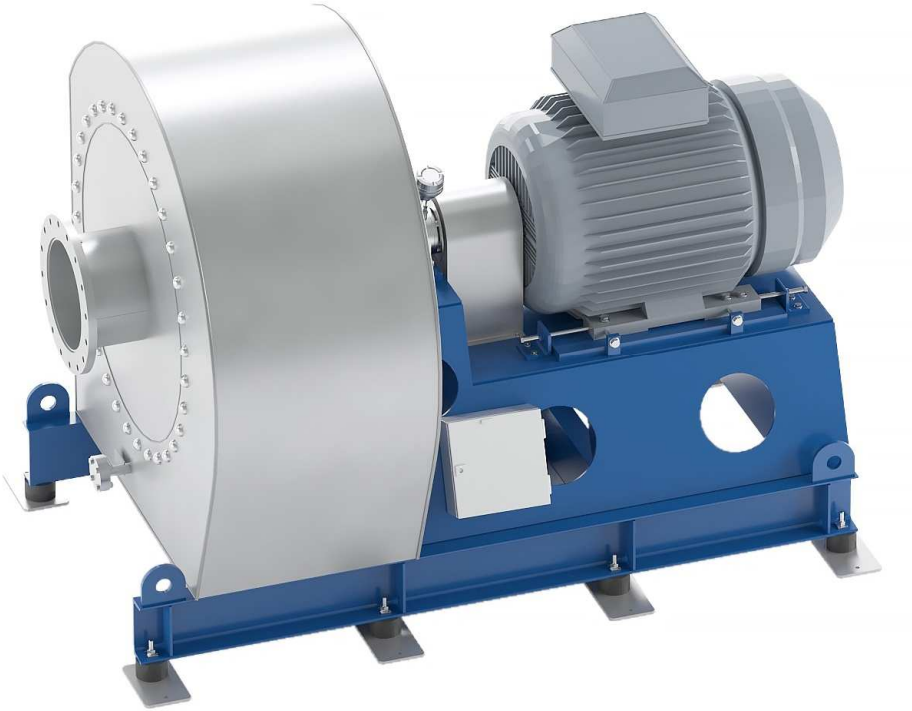
Quick Facts:



Client	Vopak
Contractor	John Zink Hamworthy
Application	Thermal Oxidizer
Country	Netherlands
Machine type	2 Zone-0 Blowers
Year of production	2022
Winning factors	- Loyalty - End-User relationship - References - Design to process conditions

REFERENCE PROJECTS

Quick Facts:



Client	Cabot Corporation
Contractors	without
Application	Carbon Black
Country	Italy
Machine type	Zone-20 Blower
Year of production	2019
Winning factors	- World´s only manufacturer of Zone-20 blowers - Reference in Netherlands - Design for future capacity expansion

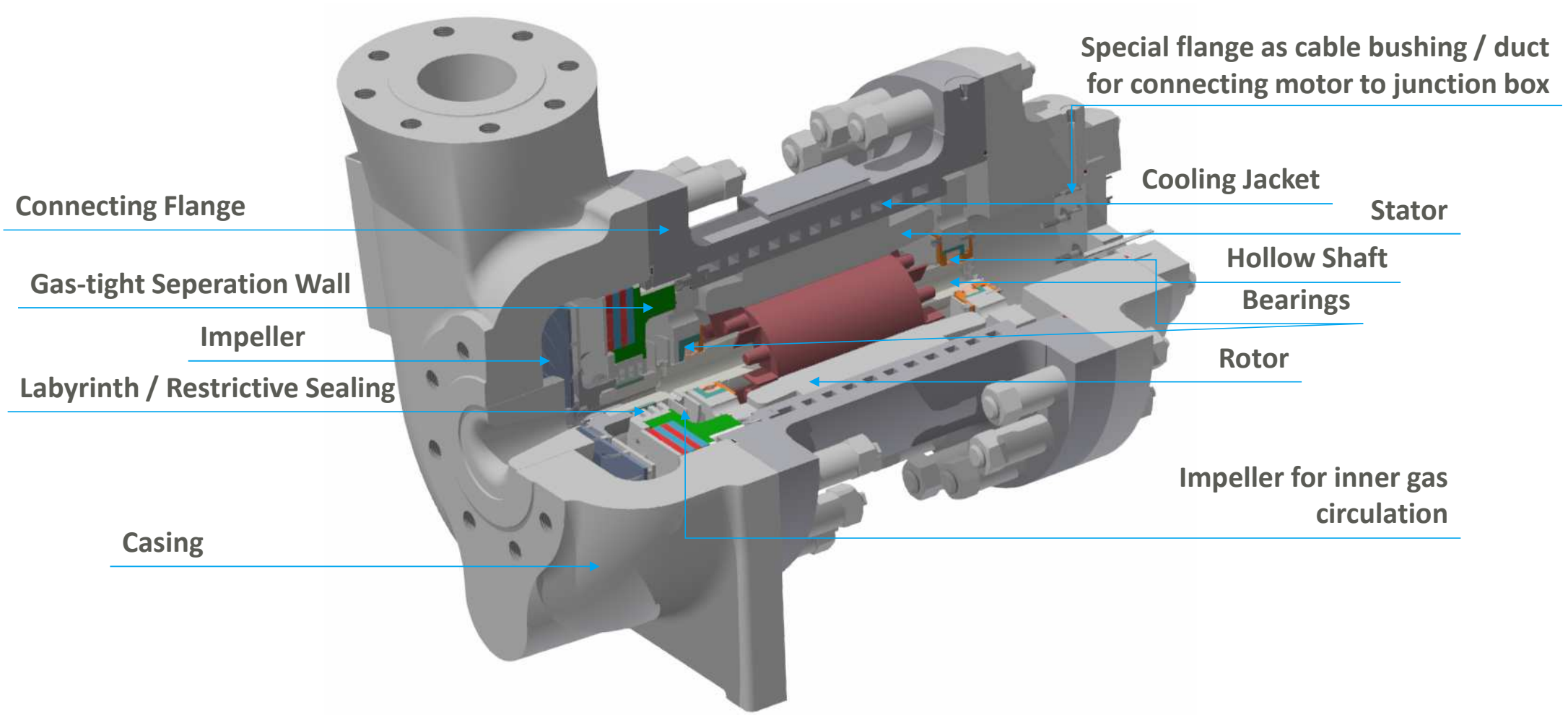
HERMETICALLY ENCAPSULATED BLOWERS AND COMPRESSORS

Volume Flow	**20 – 11,000 m³/h**
Maximum Pressure	**250 bar**
Pressure Ratio / Stage	up to **1.5**
Speed	up to **20,000 rpm**
Motor Power	up to **600 kW**

Benefits

- Hermetically Design with 0-Leakage
- Explosion proof design
- “ready-to-use” plug unit
- CAPEX & OPEX savings compared to Integrally-Geared-Compressors
- Short delivery time
- Easy maintenance and installation

HERMETICALLY ENCAPSULATED BLOWERS AND COMPRESSORS



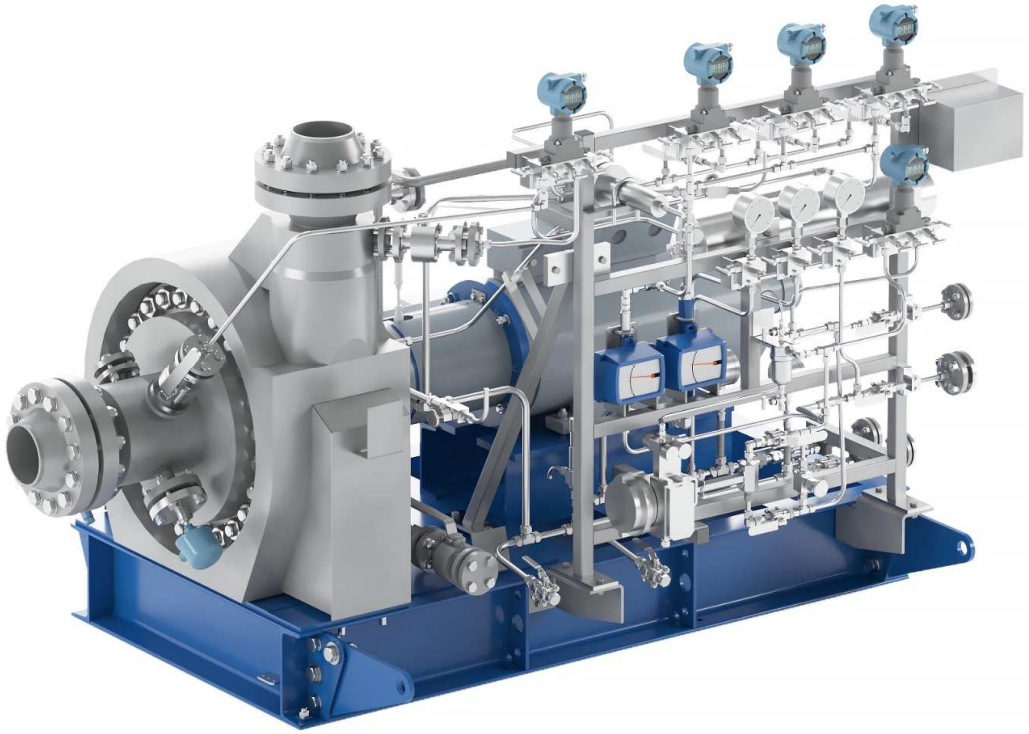
REFERENCE PROJECTS

Quick Facts:

Client	IABG
Contractor	ALM (Ateliers de la Meuse)
Application	Satellit Test Bench (Thermal Conditioning Unit)
Country	Germany
Machine type	11 Nitrogen Recirculation Blowers (HETICO)
Year of production	2022
Winning factors	- References - Loyalty - Hermetically design

REFERENCE PROJECTS

Quick Facts:



Client	LyondellBasell
Contractor	I.S.G. S.p.A
Application	Cataloy Process
Country	Italy
Machine type	Magnetic coupled recirculation blower (MACOUCO)
Year of production	2018
Winning factors	- Reliability of machine - References - Hermetically design - Customer relationship

FIMA MODEL SERIES

F1 Series
Single Stage Blowers and Compressors

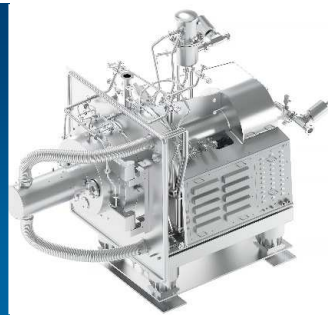
F3 Series
Multistage Blowers and Compressors

F7 Series
Cross Flow Blowers

F2 Series
Hermetically encapsulated Blowers and Compressors

F6 Series
FIMA Basics

F5 Series
Centrifuges and Bottom Valves



F4 Series
Explosion Proof Blowers

F8 Series
Axial Blowers

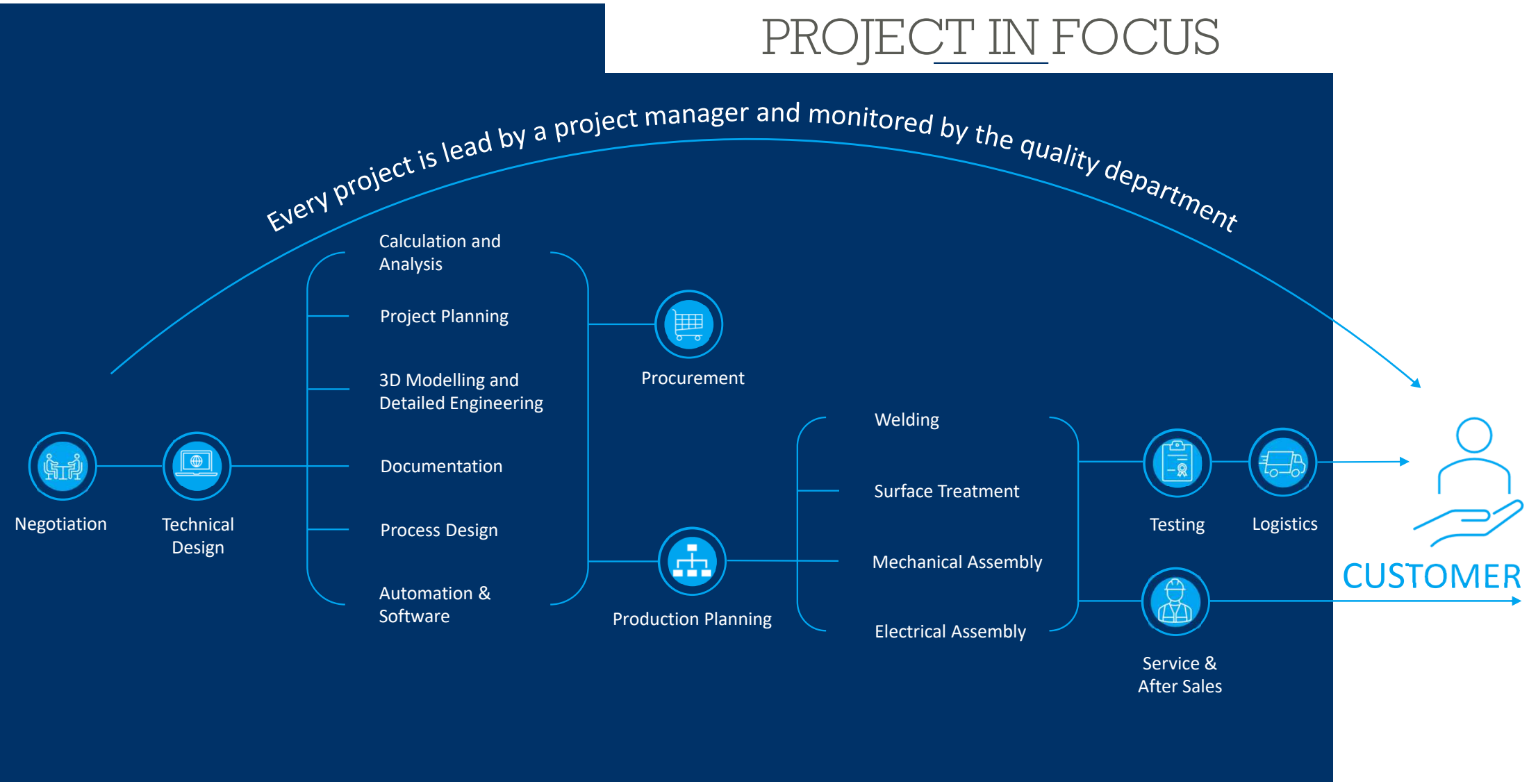
SERVICE FROM THE ORIGINAL

EXCELLENT SERVICE – SERVICE@FIMA

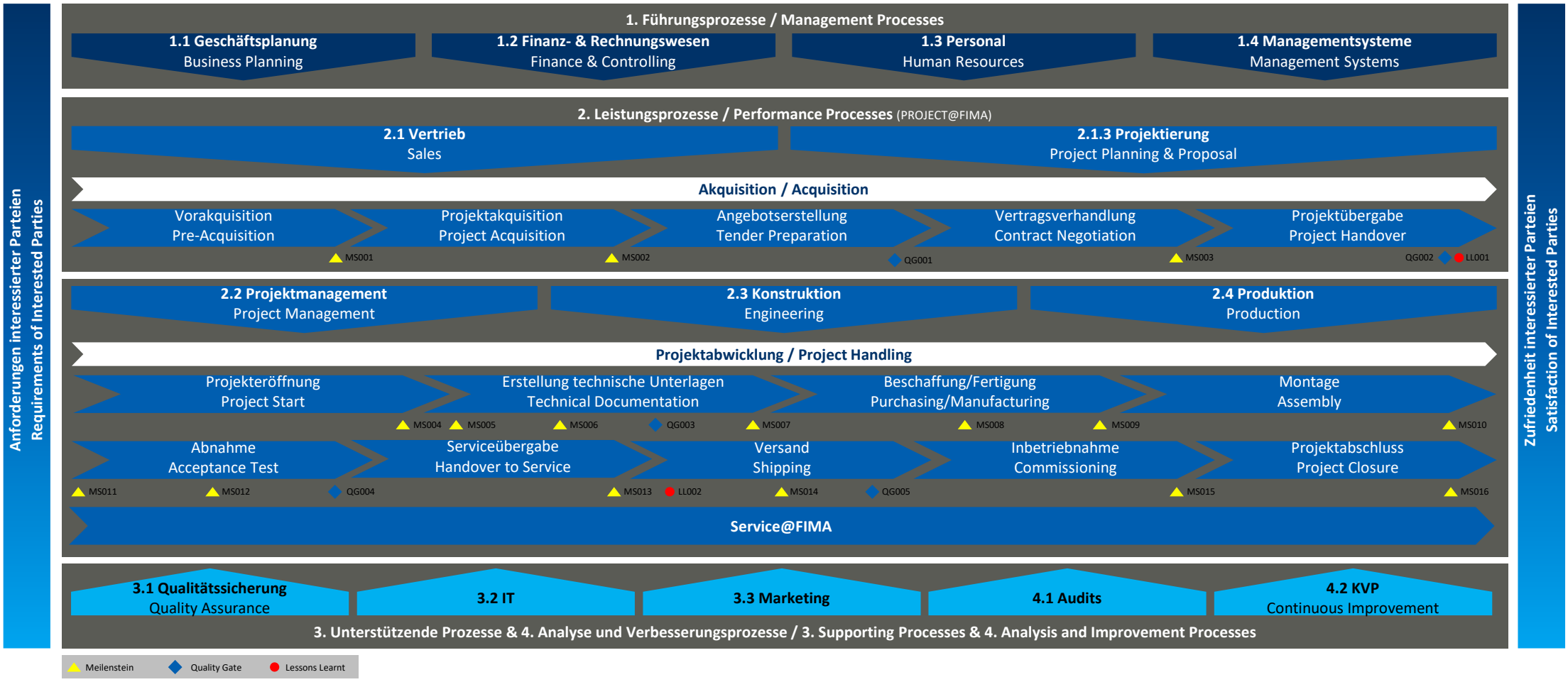
Your benefits:

- Fast response time
- Highly trained and up-to-date service technicians
- Modifications to current standards, norms and in compliance with current machine guidelines
- Customer specific modifications
- Discount on spare parts & technician work hours
- Set planned maintenance
- Spare parts from original equipment supplier

PROJECT IN FOCUS



PROJECT ORGANIZATION



ENGINEERING – YOUR MACHINE AT THE FOCAL POINT

Design

- 3D: Autodesk
- 2D: Autodesk
- 2D P&ID: Autodesk
- FEM: ProE Mechanica
- ELECTRIC: EPLAN

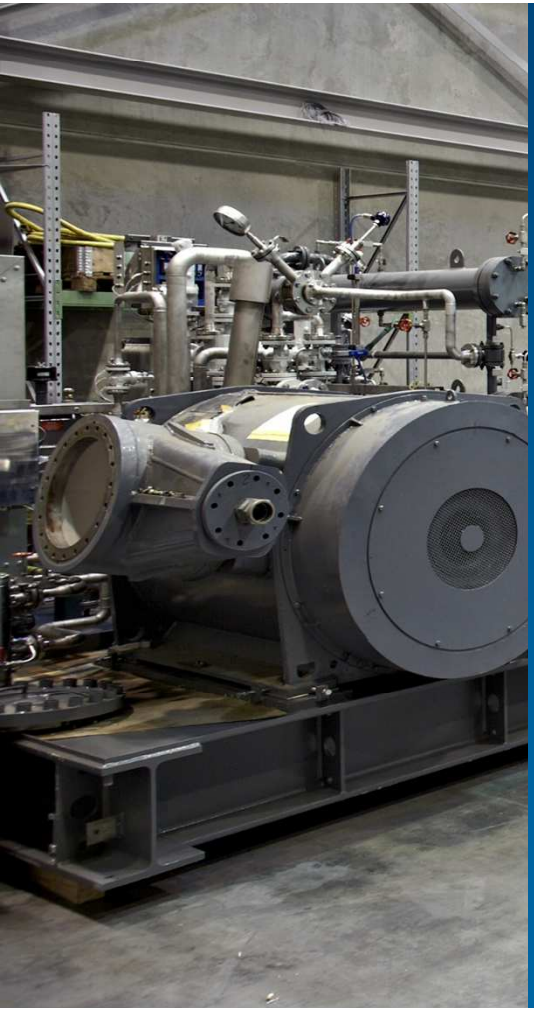
Aerodynamics

- OEM-Software
- Experimental measurements
- CFD analysis: NUMECA FINE™/Turbo
- Gas programs: PROPER

Mechanical

- OEM-Software
- Rotor dynamic lateral: OEM (FVA SR3-like)
- Rotor dynamic transient torsional: OEM (FVA DRESP-like)
- FEA: ProE Mechanica

RELIABILITY THROUGH QUALITY



Our thorough tests ensure reliability!

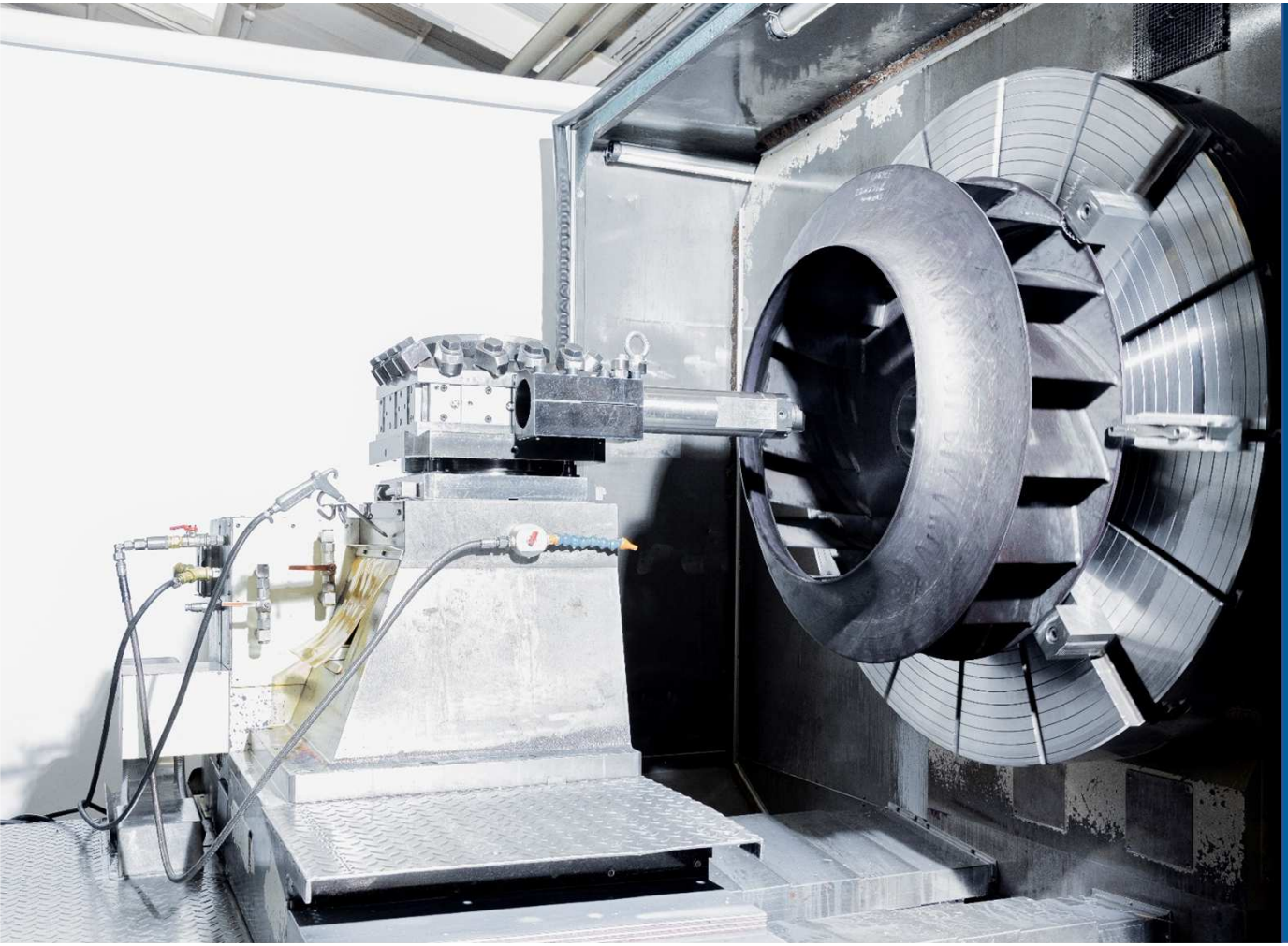
- Mechanical run test
- Noise Measurement
- Performance Tests
- Process simulation
- FEA Analysis
- Non-destructive Testing

API American Petroleum Institute

ASME SETTING THE STANDARD

DIN

FROM RAW MATERIAL TO HIGH-PERFORMANCE BLOWER



Production area

On the area of 6,000 m² we manufacture and weld impellers, housings and base frames from a wide variety of raw materials:

- Ferritic steels
- CrNI steels
- Aluminum
- Titanium

Inhouse testings

- Ultrasonic test
- Penetrant test
- Visual test
- Pressure test

FROM RAW MATERIAL TO HIGH-PERFORMANCE BLOWER

Our performances

- Welding
- Lathe
- Mill
- Drill
- Assembly
- Balancing
- Sandblasting
- Painting
- Testing
- Black & white separation

Certificates

- AD 2000 HP0 / HP 100R
- DIN EN 13445-4
- DIN EN ISO 9606-1

REGULATIONS, SPECIFICATIONS, CODES AND STANDARDS

Country Specific **Regulations**

Various geographical and political regions enforce local regulations and require relevant certifications, which must be provided by the manufacturer, for example:

PED

ASME

API, DIN

TR.CU (OSH – DOSH – SASO – GOST)

CENELEC

Customer **specifications**

Particularly in the Oil and Gas Industry, many end users issue their own specifications for vendors, for example:

DEP SHELL

EIL

Novolen

BASF Werksnormen

Codes & Standards

Design Standards, for example:

DIN EN ISO10442

DIN EN 14986

DIN EN ISO 80079-36

DIN EN ISO 5801, VDI2044

DIN ISO 21940-11

IEC,VDE

SUSTAINABILITY AT FIMA

Optimization and Improvement of all process with goals to:

- Reduce waste
- Reduce CO_2 emissions
- Reduce pollution
- Improve efficiency

Sub-supplier Vetting

for their approach to sustainability and their future ESG-Rating (Sustainability Performance-Score)

Selection of Materials

according to recognized criteria for recycling or reuse

Clean Energy

20% of electricity consumed is produced as renewable energy (solar panels)

FREQUENTLY ASKED QUESTIONS

1. Which tests are peformed before equipment delivery?
2. Which international specifications and regulations do our machines fulfill?
3. Which aftermarket services can we offer?
4. What packaging and transportation options are available?
5. What quality can FIMA guarantee? How is quality measured at FIMA?
6. Which technology is used for which processes and applications?

FIMA MADE IN GERMANY.
SELECTED REFERENCES.