

# | Agenda

01 SELZER Group	02 Products	03 Technologies				
Facts / Figures Introduction INDUS Locations	Transmission components Engine components	Development Production				
Customers	Brake components	Tool shop				
Start here	Start here	Start here				
04     Visions						

1

Ē.

60







# 01 | Facts & Figures







### Facts – Figures

### The SELZER Group

When our company was founded almost 100 years ago, nobody could imagine the breath-taking speed of change in the world of technology. New challenges keep generating new products. Then, now, and in the future. We don't provide products off the shelf, but develop and produce innovative components and assemblies for your automotive and non-automotive applications. We benefit from our exceptionally high level of vertical integration that enables us to offer a variety of techniques from a single source.





3 von 57



俞

### Locations

### The SELZER Locations

Our customers successfully operate in international markets.

We provide three worldwide locations to support our customers anytime

Germany – Driedorf-Roth

Brazil – Vinhedo

China – Kunshan

Germany	Brazil	China
est.	est.	est.
1923	2005	2017









**KUNDENLOGO** BITTE AUSTAUSCHEN





Customers

### The SELZER Group

SELZER owes its steady growth to the close cooperation with many longterm partners





### History



In 1923, Heinrich August Selzer founded a company in Hörbach that processed metal, which became the corner stone for the SELZER corporation. After his death in 1955, the business was continued by his sons Erich and Oskar. In the 70s, the third generation managed the company: Hans Joachim, Karl Heinz and Rudolf Selzer transformed "SELZER Fertigungstechnik" into a modern enterprise. Since 2007, Tobias Selzer is a fourth-generation member of management. In addition the current main shareholder INDUS, he and his brothers Burkhard and Hubertus maintain a close relation with the company as shareholders.



# 

KUNDENLOGO BITTE AUSTAUSCHEN

Â

### Introduction INDUS

### **INDUS Holding AG**

Leading specialist for long-term corporate participation and development

45 companies in German-speaking countries

Five core segments in the manufacturing sector

Sales and production locations in 30 countries

In total over 10,000 employees

Turnover 2016: 1,44 Billion Euro

Listing since 1995

Listed in the SDAX





Â

# 02 | Products





8 von 57



# 02 | Products

### Products







# 02 | Transmission

### Products





10 von 57



# 02 | Internal Shift Control

### Products > Transmission

### **Product description**

### Laser welding

- Turning
- Assembly

Technologies used in manufacturing:

- Hardening
- Stamping

•

- Fine blanking
- Forming

### Milling Honing

- Grinding
- Notching



# 02 | Shifttower

Products > Transmission

# <text>





Â

# 02 | Gearshift Shaft

Products > Transmission







Â

# 02 | Cast Shift Fork

Products > Transmission





14 von 57

Â

# 02 | Clutch Release Fork

Products > Transmission



Â

lev 000-2018030



# 02 | Shift and Guide Bar

Products > Transmission





16 von 57

Â

# 02 | Gearshift Shaft

Products > Transmission





Â

# 02 | Piston Rod

Products > Transmission





Â

# 02 | Shift Fork DCT

### Products > Transmission

### Product description

The Shift Fork transmits the shifting motion from the gear selectors to the sliding couplings. Its position is monitored by an integrated magnetic sensor system.

### i Tashuala

# Technologies used in manufacturing:

- Fine blanking
- Stamping
- Hot-riveting
- Laser welding
- Assembly
- Magnetise

- Hardening
- Grinding
- Laser cleaning
- Plasma cleaning
- Adhering
- Aui







Â

# 02 | Shift Fork Manual Transmission

Products > Transmission







Â

# 02 | Engine

### Products





21 von 57



# 02 | Torsion Shaft

Products > Engine

# Product description

The Torsion Shaft in electric vehicles with Range Extender enables the backlash-free connection between motor and generator.





# Technologies used in manufacturing:

- Turning
- Broaching
- Gearing
- Hardening
- Milling
- Assembly



Â

# 02 | Bracket

Products > Engine

**KUNDENLOGO** 

BITTE AUSTAUSCHEN





# 02 | Auxiliary Shaft Motorbike

Products > Engine







Â

# 02 | Auxiliary Shaft Passenger Car

Products > Engine







Â

# 02 | Lever Inconel

Products > Engine

# Product description

Operates the "wastegate" on the exhaust side of the turbocharger.



# i

# Technologies used in manufacturing:

- Fine blanking
- Grinding
- Laser welding



# 02 | Eccentric Shaft

Products > Engine





Â

# 02 | Brake

# Products









# 02 | Ramp Disc

Products > Brake

**KUNDENLOGO** 

BITTE AUSTAUSCHEN

**A**Rev. 000-20180301

# Product description The Ramp Disc transmits the mechanical force for actualing the parking brake in a passenger car. I I Chonologies used in manufacturing: - Fine blanking - Hardening - Phosphatising



# 02 | Actuator Rod

Products > Brake

# Product description

This safety component transmits the brake pedal movement to brake booster.

# Technologies used in manufacturing:

Welding

i

- Phosphatising
- Stamping
- Turning

# **SELZER**

# 02 | Actuation Lever

Products > Brake



# 02 | Further Applications

### Products









### 02 | **Recip Shaft**

Products > Further Applications







Â

# 02 | Spindle

Products > Further Applications









**SELZER** 

35 von 57

KUNDENLOGO BITTE AUSTAUSCHEN

### Technologies

Investments in modern technologies and optimum synchronized processes guarantee individual uncompromising precision from one source ranging from the component part to complete readyto-assemble systems.

Your task is our challenge!

### Technologies





36 von 57

Â

### Development > Design

### Design

Our product development is supported by staffs with many years of professional experience. SELZER develops and evaluates its own design solutions for desired functions. We use common processes such as 3D modelling (with Catia or Creo software). The product development matches the approach of our customers, so that the results can be implemented without modifications.

Competence from a single source.





37 von 57



### Development > FEA

### Finite Elements Analysis

Stress analysis (with Ansys software) and statistical tolerance analysis (with Enventive software).

We produce plastic models with out own 3D printer to quickly get a "tactile" feel of our ideas.





38 von 57

# Development > Prototypes

### Prototypes

We develop and manufacture our production-quality prototypes in our own prototyping workshop. Prototypes are documented according to customer specifications and applicable standards.





39 von 57



# Development > Test Bench

### Test Bench

Life tests can be performed on pulsating fatigue-test machines, cold chambers, environmental test chambers, and load test stands.





40 von 57

### Development > Project Management

### **Project Management**

Our project management supports each project from the receipt of an order to the start of the series production. A project starts upon the receipt of an order in product development (design). The design is verified using prototypes, which are produced in the in-house prototyping workshop. After the completion of the prototype phase, the procurement of the standard equipment starts. The project is handed over to the production department after the final acceptance of the operating resources. Projects are carried out according to the SELZER Product **Evolution Management System** (PEMS), which meets known automotive standards such as AIAG, VDA, or ISO TS 16949.





41 von 57



Â

### Manufacturing > Fine Blanking

### **Fine Blanking**

Fine blanking enables the production of highly precise parts without finishing and is suitable for almost all types of metals. This method is particularly advantageous for gear or brake components with very tight tolerances.

### We have:

Fine blanking presses with the following specifications:

- Press force: 1600 kN to 8000 kN
- Material thickness: 1 to 10 mm
- Material width: up to 300 mm
- Material strength: up to 700 N/mm<sup>2</sup>



# Application example





42 von 57



Â

### Manufacturing> Stamping / Bending

### Stamping / Bending

Our automatic stamping machines are highly productive and flexible in use.

Automatic stamping machines with the following specifications:

- Press force: 1.600 kN to 8.000 kN
- Material thickness: 1 to 8 mm
- Material width: up to 400 mm
- Material strength: up to 700 N/mm<sup>2</sup>



### Application example





KUNDENLOGO BITTE AUSTAUSCHEN





# Manufacturing > Deep Drawing

# Deep Drawing

We closely cooperate with our sister company on deep-drawing.

See the following link:

www.fichthorn.de





44 von 57



# Manufacturing > Turning

# Turning

We turn on automatic multi-spindle and single-spindle lathes and CNC bush-type lathes and CNC chucking lathes.



# Application example







# Manufacturing > Milling

# Milling

Our modern processing center's produce complex components with precise surfaces



# Application example





46 von 57

KUNDENLOGO BITTE AUSTAUSCHEN

### Manufacturing > Grinding

### Grinding

We use various grinding machines to manufacture components with the highest precision and quality.

We have:

- CNC-controlled double-sided grinding machines; rotary table and pass
- Centerless grinding machines; pass and plunge cut
- CNC-controlled centerless grinding machines with automatic feeding of parts; plunge cut
- Centerless grinding machine with automatic feeding of parts; plunge cut
- CNC-controlled grinding machine with CBN grinding wheel



### **Application example**



KUNDENLOGO BITTE AUSTAUSCHEN





### Manufacturing > Heat Treatment

### **Heat Treatment**

We use a wide range of furnaces and systems for almost all common hardening process. Our own materials laboratory monitors the quality.

We have:

- Multipurpose chamber furnaces for carburization and hardening and tempering
- Retort ovens for nitro carburization with or without oxidizing
- Tempering furnaces
- Induction hardening plants with medium and high frequency



# Application example







Â

# Manufacturing > Gear Cutting

# Gear Cutting

Highly productive hobbing machines produce sophisticated gears for powertrain applications.



Application example





KUNDENLOGO BITTE AUSTAUSCHEN



### Manufacturing > Mounting

### Mounting

We use various processes, manufacturing techniques and equipment for the mounting process:

- fully-linked, highly automated assembly lines
- Force-displacement monitored assembly processes
- Automated leak test
- Assembly units are inspected for function and geometry
- Laser markings are magnetized and the flux density is checked
- The worker is guided during the assembly activities, visualization and monitoring via screen



### Application example





50 von 57



Â

### Manufacturing > Welding

### Welding

We use a large portfolio of welding equipment of different levels of automation such as TIG, MAG, Arc Force, laser or resistance pressure welding processes. The quality of welded joints is monitored by our own materials laboratory and during production by in-process monitoring of welding parameters.



### Application example





51 von 57



### Manufacturing > Bonding

### Bonding

SELZER uses adhesive bonding in large series production. We use both, UVcuring single-component adhesives as well as two-component mixing systems composed of resin and hardener. Combining suitable pretreatment methods, such as laser or plasma cleaning of components, ensures perfect adhesive results.



# Application example





52 von 57



### Tool Shop > Competences

### **Tool Shop**

Our own tool making department uses ultra-modern and innovative production methods to produce and maintain tools for fine blanking, progressive dies, bending and transfer. Tool position locking and camera systems are used to ensure excellent quality and the highest production reliability. Naturally, the tooling department is experienced in the production of milling, turning, broaching, welding and hardening devices. This also where production processes are automated and interlinked.





53 von 57



Â

### Laboratory > Cleanliness

### Cleanliness

Component cleanliness is a technical quality feature in the automotive that must be controlled and documented. The residual contamination test must provide reliable data on product and process quality.

How are tests performed? Standard-compliant cleanliness analyses of components and assemblies follow established standards:

- VDA Volume 19
- DIN EN ISO 16232
- and according to customer and company standards





54 von 57



Â







55 von 57

# 04 | Visions

### Sustainability

### Sustainability

The company's strong value orientation in it's recent decades culminated in the successful and long-term development of SELZER. We equally and simultaneously strive to achieve economic, environmental and social objectives. We intend to create lasting values, enable good working conditions and to take good care of nature, environment and resources. Our daily activities are therefore subject to a code of conduct, which all employees are required to follow. We are aware of our role as a responsible member of society and of our responsibility towards customers, business partners, shareholders, and employees. The company therefore is committed to clear principles that govern the corporate and social Actions.





56 von 57

**KUNDENLOGO** BITTE AUSTAUSCHEN



# | That's SELZER

# Partnership

ogy High y	the ertical	market	Wide range of machi	ines	Technology			
rtment integr	ation Medium	n-sized, family-owned company	and linked process	es Global Footprint			<sup>ent</sup> inter	
	Certifi ISO/TS	ed to 16949	Assembly Production	Long ext the	stablished in e market		Shop se ide range of	
and linked process ange of machines	<sup>ses</sup> Many expe	years of rience	esign and FEM departn in-house	High v <sup>nent</sup> integr	ertical ation			
inked processes <mark>ow-how ir</mark>		High-tech standard tool construction in-house	d Test bench in-house	Prototype Shop in-house	ai	nd linked pro	cesses	
ion punch chnology	ning the mar High			Know-Ho t Blankin	ow in der g Techno	Fine <sub>Pr</sub> logy		
	R		57 von 57			KU Biti	INDENLOGO	





KUNDENLOGO BITTE AUSTAUSCHEN