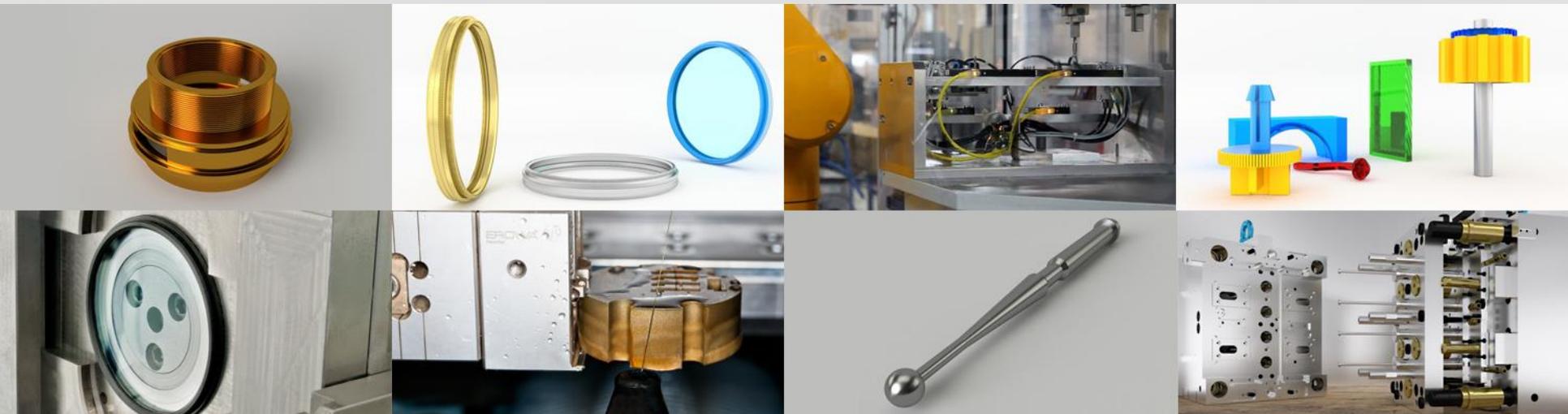


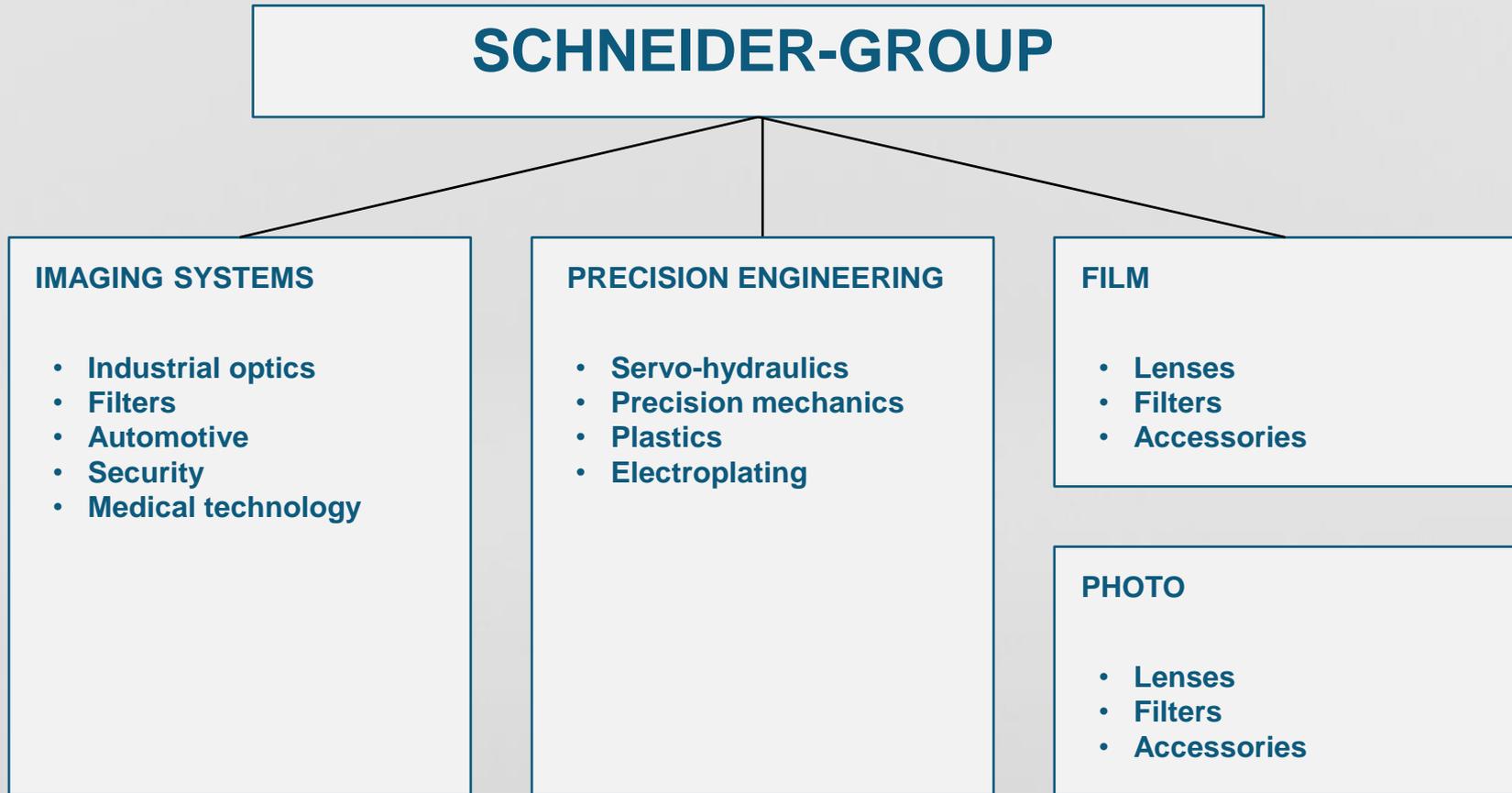
PENTACON GMBH



PENTACON – Part of the Schneider Group



Main activities of the Schneider Group



PENTACON - Facts & Figures

Certificates

- DIN ISO 9001:2015
- IATF 16949:2016
- DIN ISO 14001:2015
- DE AEOF 102522
- DIN ISO 17025:2005 (DAkkS accreditation)

Figures 2019

- Revenue: 10.0 Mio.€
- Balance sheet total: 5.4 Mio.€
- Equity ratio : 27%
- Employees: 115
- Shifts per week: 15

History

- Founded in 1964
- Legal form PENTACON GmbH since 1997
- Company of precision mechanics

Memberships

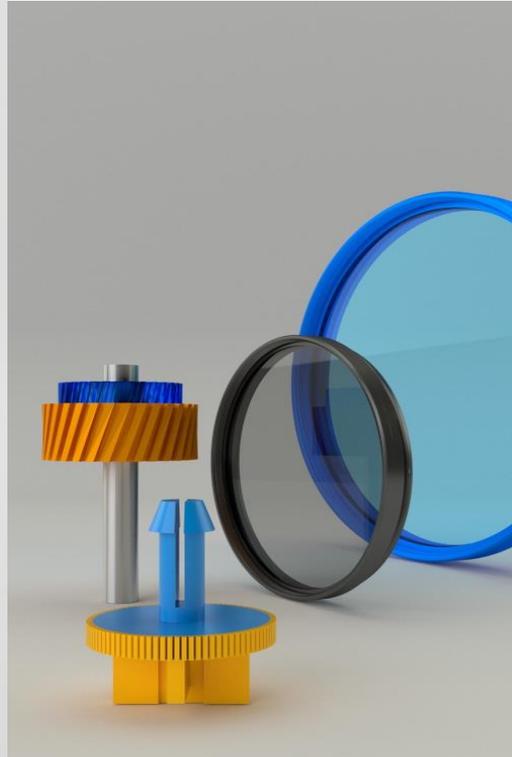
- IMPRO e.V.
- AMZ Sachsen
- TecPart/ GKV

Business Units of PENTACON

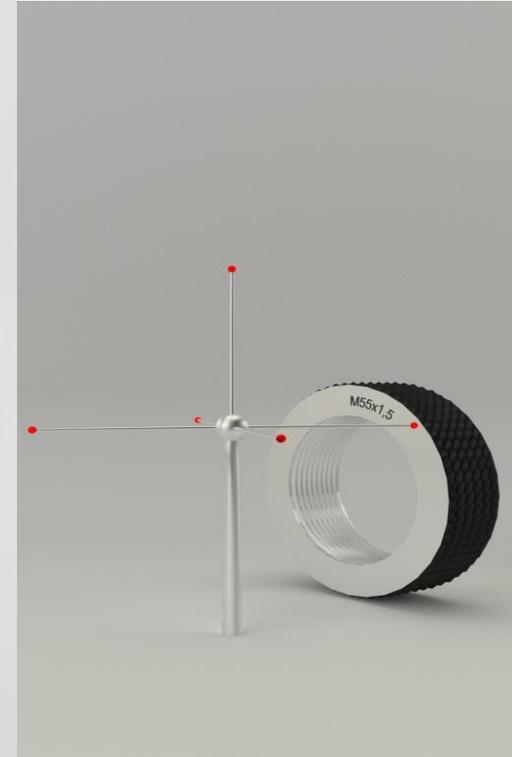
MECHANICAL PRODUCTION



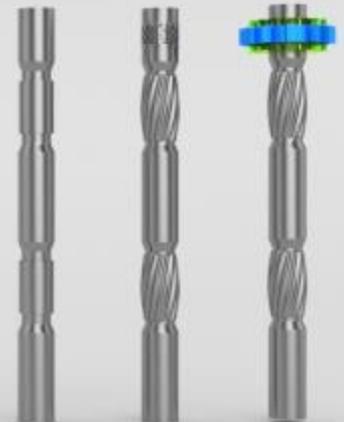
PLASTIC INJECTION MOLDING



MEASURING- & CALIBRATION LABORATORY



1. MECHANICAL PRODUCTION



1. Mechanical Production: thin-walled and precision parts

- Internal and external threads with tight tolerances up to 4g
- High surface quality up to Rz 2 through diamond machining
- Processing of forming blanks / inserts over 50 mm diameter in special holders
- Aluminum, tempered steels, brass alloys and other
- For example, flanges, hydraulic parts, spacers, optical parts and others

Measures (up to)

100 mm from bar
160 mm as chuck parts
max Ø 160 mm

Accuracy

< 0,02 mm up to 100 mm Ø
< 0,03 mm over 100 mm Ø

Batch

500 – 10.000



1. Mechanical Production: Swiss turning

- Swiss turning of Aluminum, HSS-steel, Q & T steels, etc.
- Very high accuracy
- Low-waste production (cost reduction)
- 100% control for specific parts possible
- overmoulding with plastic in house possible
- Noozle needle in serial production (for diesel engines)

Measures

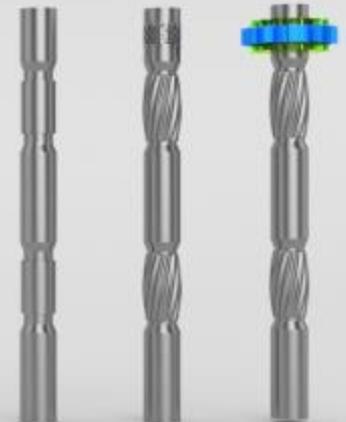
< Ø 32 mm

Accuracy

< 0.01 mm

Batch

Starting 10,000



1. Mechanical Production: Processing of cold forged parts

- Processing of extruded solid wall components as inserted parts
- Advantage of PENTACON:
 - Technology development from blank to close-contoured blank
 - Technology and process optimization
 - Short supply chain
- Nozzle body in serial production (for diesel engines)

Measures

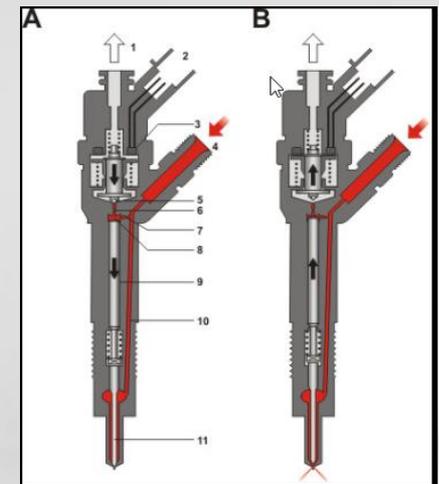
< Ø 50 mm

Accuracy

< 0.02 mm

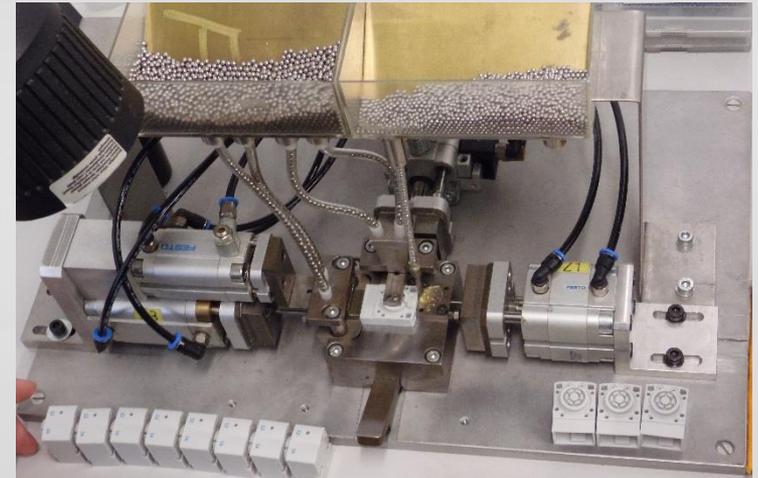
Batch

10,000 – 10,000,000



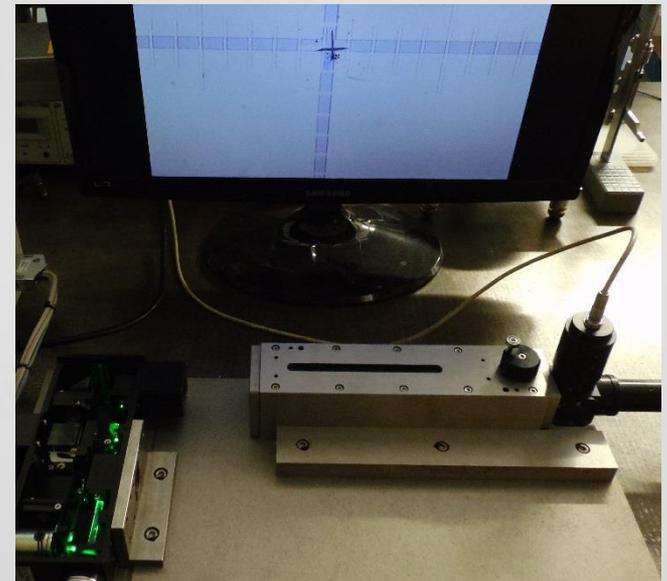
1. assemblies: module assembly mechanical

- Mechanical assembly of precision assemblies with own jig construction
- From small series to large series
- Assumption of customer service for similar assemblies



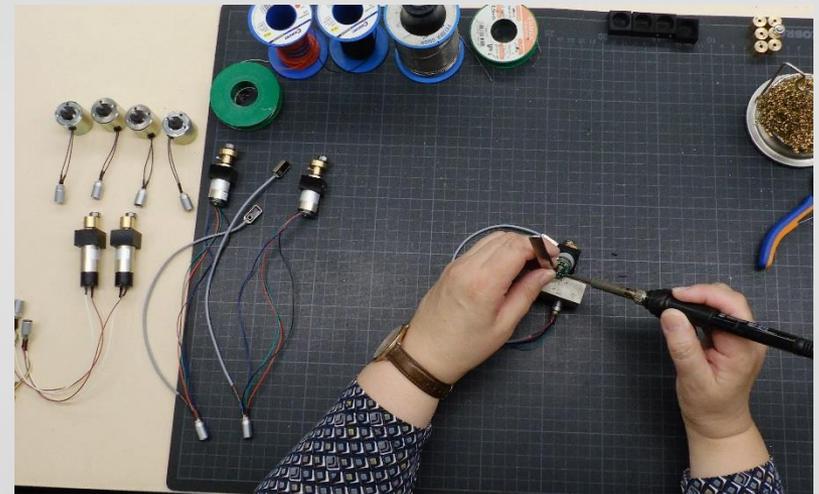
1. assemblies: module assembly mechanical / optical

- Assembly and fine adjustment of precision assemblies with optical function
- Final test in accordance with the test specification of assemblies and terminals
- Assumption of customer service for similar assemblies



1. assemblies: module assembly mechanical / electrical

- Mechanical assembly of precision assemblies with electrical components, with and without final acceptance test
- Assumption of customer service for similar assemblies



2. PLASTIC INJECTION MOLDING



2. Plastic injection molding: 1c, 2c, hybrid- & inserted parts

- 1 component and 2 component plastic injection molding
- Technology project on biological plastics
- Injection over-molding of inserted parts (e.g. electrical circuits)
- Hybrid parts and metal substitution
- Synergy advantages
 - Injection molding of hybrid parts
 - 100% optical testing

Shot weight

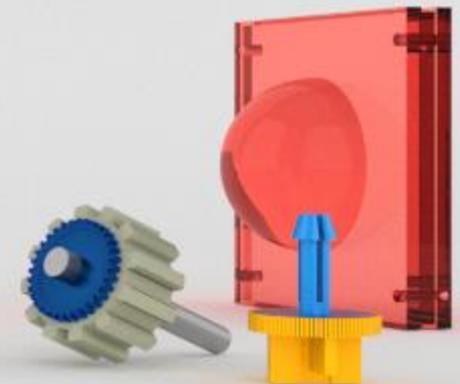
Up to 400 g

Accuracy

accor. DIN 16742

Batch

500 – 500,000



2. Plastic injection molding: Over-molding of glass

- Over-molding of coated and uncoated glass (own patent)
- Parts with high optical standard
- Compensation of thickness tolerances of ± 0.20 mm
- Glass blank is briefly exposed to a pressure of 1,500 bar and up to 400° C
- Fully-automated production

Measures

from 10 x 10 mm
to 250 x 250 mm

Thickness

from 1 – 10 mm

Accuracy

Thickness tolerance
 ± 0.20 mm

Batch

250 – 10,000



2. Plastic injection molding: Production

- 120 tons annual material throughput
- High level of automation through handling systems
- In-house development of load & unload systems
- Clean room for optical and medical components
- More than 250 injection molding forms in stock
- Integrated measuring stations for serialized control

Shot weight

Up to 400 g

Equipment

11 Machines

Batch

500 – 500,000



16

2. Plastic injection molding: Mold-making

- In-house development, design and production of molds
- Mold Flow analysis and 3D-scanning
- Consistent CAD-CAM workflow from developing to production
- In-house mold-making shop and maintenance
- Sink- and wire eroding, HSC and HPC milling
- Complex tools up to 2 t weight
- Contract manufacturing of individual parts or small series



3. MEASURING- & CALIBRATION



3. Calibration laboratory

- Expert counseling on management of test tools, equipment monitoring and calibration
- Calibration, re-calibration and adjustment of testing tools of the measuring sizes length and torque incl. documentation and calibration certificate
- Procurement of brand-new testing equipment and initial calibration

Measuring sizes

Length: < 2,500 mm
Force: < 20 kN
Torque: < 1,5 kN

Accuracy

Gauge block 0,09 μm
Length 0,60 μm

DAkkS

Gauge blocks



3. Measuring laboratory

- Competent advice on metrological issues
- Preparation of measurement concepts up to the support of proven measuring process capabilities
- Individual, serialized and specialized measuring with documentation in an initial sample test report (VDA, AIAG) or as a capability test

Measurements

Up to
450 x 450 x 300 mm

Accuracy

1.0 μm



3. 3D Scanning

- Fast and low-cost capturing of 3D geometries using a COMET L3D scanner
 - Creation of a grid model as a template for reverse engineering
 - Representation in the false color image by means of a comparison against data record
 - Geometric evaluation against drawing

Measuring field

45	(45 x 38 x 30 mm)
100	(120 x 100 x 60 mm)
250	(260 x 215 x 140 mm)

3D dot pitch

45	15 μm
100	50 μm
250	100 μm



THANK YOU