



Swiss Innovative Engineering
combined with
Best Cost Manufacturing

February 2024

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Innovative Drive Technologies from Switzerland



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COMPANY PROFILE

Who we are – Our position

birlasoft



nbc



Gammco



neosym



HIL

TOGETHER, WE BUILD.



ORIENT CEMENT



orient electric

switch to smart



ORIENT PAPER



The CK Birla Group:

- established in 1862
- one of the largest conglomerates in India
- over 25.000 FTE / US \$2.8 billion sales
 - «Automotive and Technology»
 - «Home and Building»
 - «Healthcare and Education»
- 41 manufacturing facilities
- numerous patents and awards

CK BIRLA GROUP

AVTEC®

ASSAG

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ASSAG

The Pioneer of Face Gear Technology - Swiss Innovative Engineering

- established in 1979 in Dürdingen
- global experience and leading in mechanical drive systems
- specialized in designing customer specific drive solutions
- known for its innovative solutions in the field of face gear differential drives and high precision gears
- product portfolio from transmission components to assemblies and engineering services

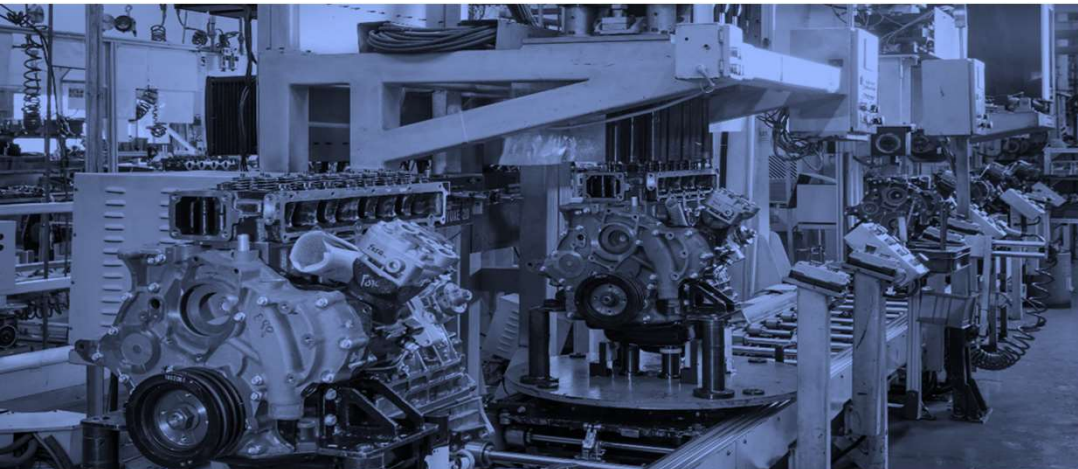
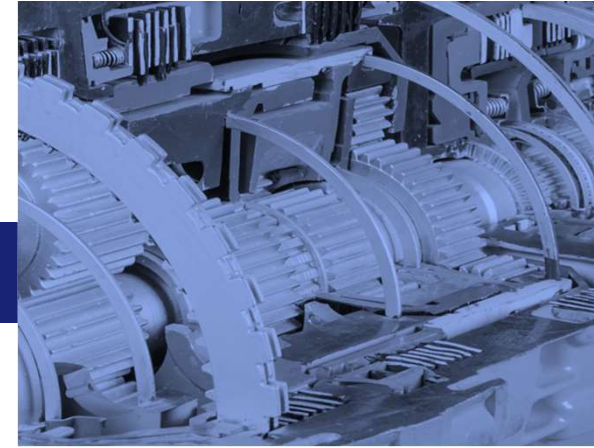


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AVTEC Ltd.

India's largest integrated powertrain manufacturer

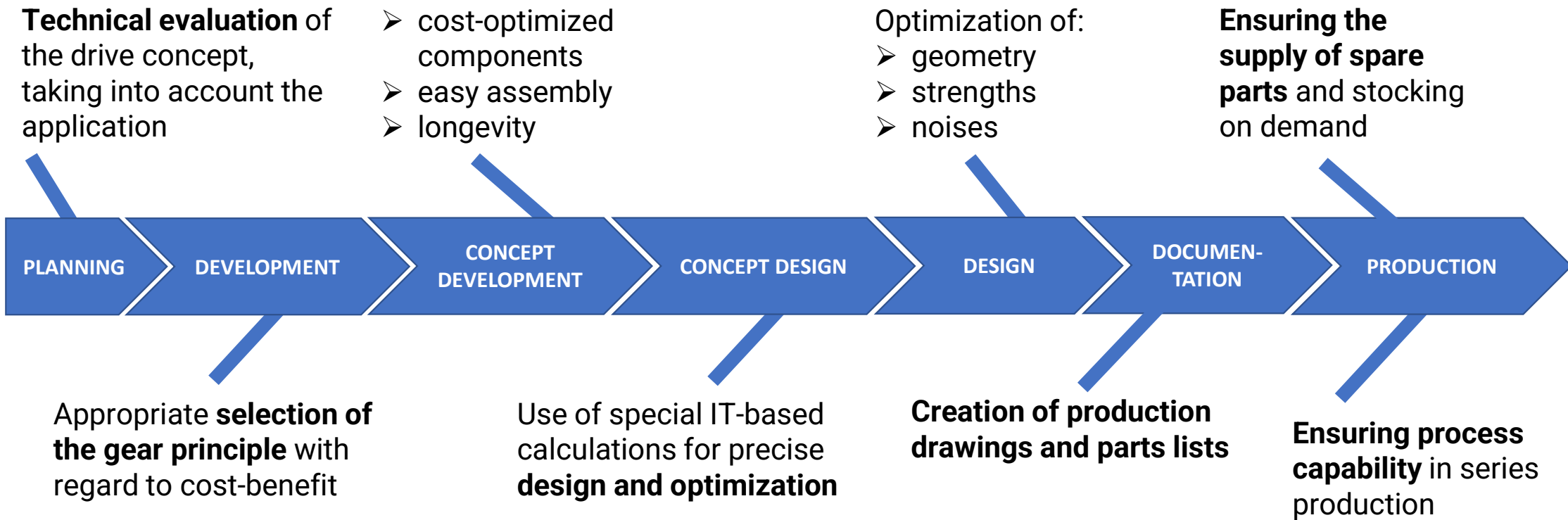
- one of the leading manufacturers of engines, transmissions and high precision components
- offers unique technological competency across the entire value chain, from design to production and assembly
- products for Automotive, Off-Highway, Defence, Agriculture and Railway industry
- serves some of the best-known domestic and global Automotive and Off-Highway companies



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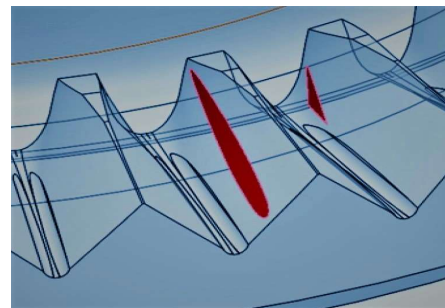
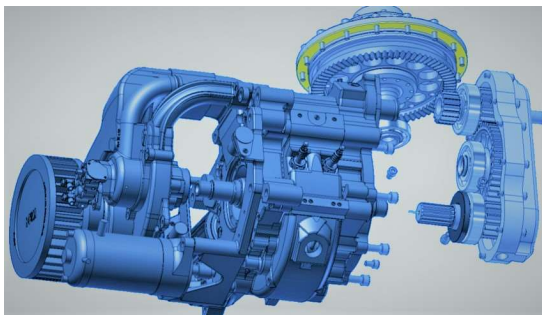
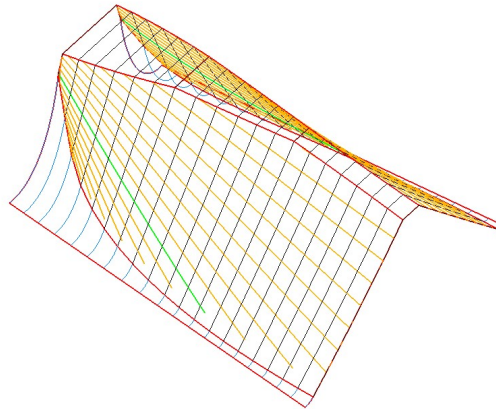
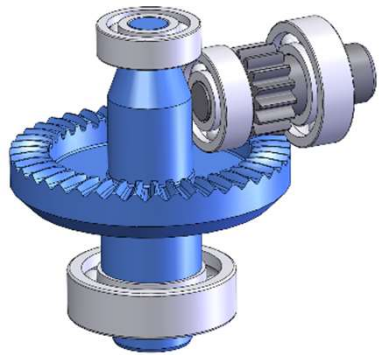
FROM CONCEPT TO FINISHED PRODUCT

We support you during the product development and beyond



ENGINEERING

Research & Development, Construction and Design



- **CAD Systems**
 - SolidWorks & Inventor
- **ASSAG Crown Gear Technology Software**
 - Geometry- / Load capacity calculations
 - 3D CAD macros for simulation purposes
- **Kissoft Modules**
 - Gears
 - Strength calculations
 - Simulations
- **Gear measuring machine**
- **3D measuring machine for body geometry**

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OUR PRODUCTS

The solution is more than a customer specific drive

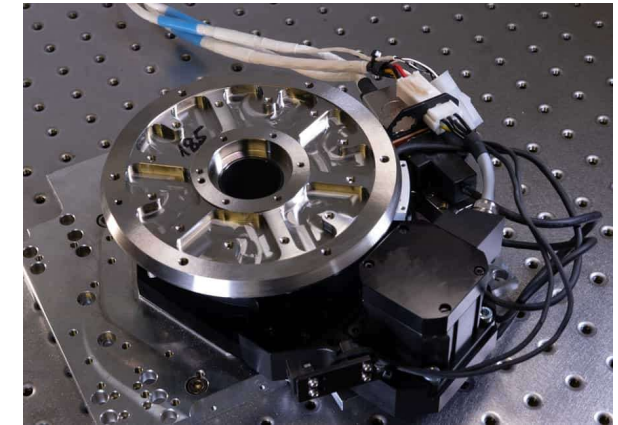
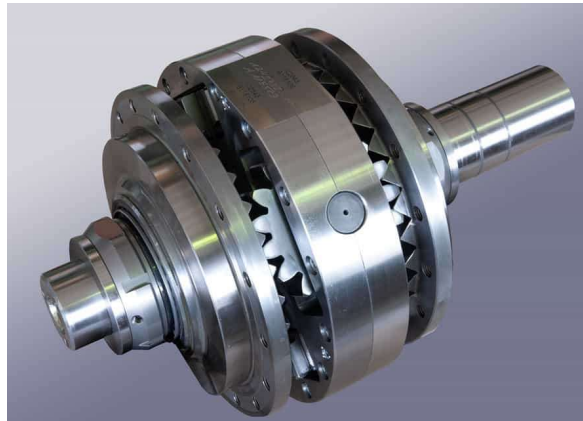


Gears and Components:

- Face Gears
- Spur Gears
- Internal Splines / Ring Gears
- Helical Gears
- Shafts

Transmissions and Assemblies:

- Angular Drives
- Planetary Drives
- Differentials
- Compensation Transmission
- Wave Transmission



Electromechanics:

- Direct Drives
- Drives with gear reduction
- Torque Motors

OUR PRODUCTS

Typical industrial applications

- Machine tools (angle gears)
- Mobile work machines (unlocking and planetary gears)
- Medical technology (precision positioning)
- Automotive engineering (differentials)
- Textile and clothing machines (tensioning and winding gears)
- Packaging (worm and planetary gears)
- Automation und robotics (servo gears)
- Transport systems (spur gears, complete drives)
- Printing machines (compensation gears)



PERFORMANCE OVERVIEW

3 possibilities for sustainable cooperation

1

Extended workbench / build-to-print of components and assemblies (based on production drawings including initial sample inspection)

- at **competitive costs** (Best cost country advantage)
- to **increase your profitability** / market share
- with **stable supply chains** through flexible manufacturing capacities in India

2

Optimization / reengineering of components (incl. prototyping)

- **improvement of existing products**
- cost optimization
- increase in productivity in terms of manufacturing and assembly

3

Innovations and new technological developments in the automotive sector (Swiss Innovative Engineering)

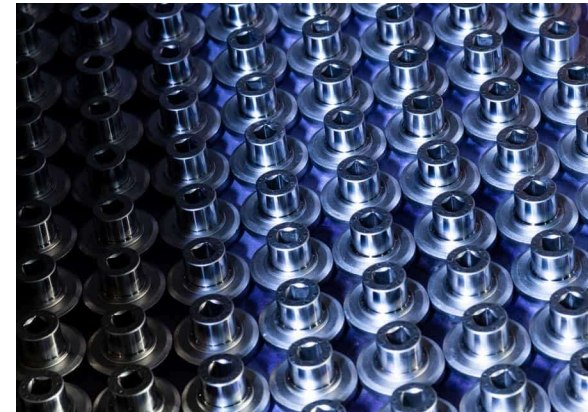
- New components for **new applications**
- Prototypes via ASSAG / series production via AVTEC
- **use of common synergies**
- e.g. electromechanical steering

PRODUCTION

Single production (ASSAG) / Series production (AVTEC Ltd.)



- **Individual production and small series** with associated manufacturing partners by ASSAG in Europe



- **Series production** for medium and large quantities at AVTEC Ltd. in India

GEAR MANUFACTURING

3D or 5-axis Milling / Hobbing (Face Gear)



- **Use for small series and large components**
- High-precision **gearing qualities up to DIN 3**, both in soft machining and in hard fine machining



- **Use for medium and large series**
- Ensuring process reliability with **gearing qualities \geq DIN 6**, both in soft machining and in hard fine machining

MANUFACTURING FACILITIES

IATF 16949 and ISO 14001 certified plants



Hosur Plant, near Bangalore
Transmissions for «Light Commercial Vehicles» and
«Off Highway Vehicles», as well as Components
200,000 sqm



Pithampur Plant, near Indore
Engines, Transmissions and Components
for Automotive
600,000 sqm

ASSAG | **AVTEC**

MACHINERY

A broad range of state-of-the-art machinery

- **Horizontal Machining Centers**
- **CNC Vertical Turning Lathes**
- **CNC Gear Shaping**
- **Gear Shaving**
- **Vertical Machining Centers**
- **CNC Lathes**
- **CNC Gear Hobbing**
- **CNC Gear Grinding**
- **CNC Internal / Universal Grinding**
- **CNC Cylindrical Grinding**
- **Balancing Machine**



MACHINERY

Equipped with state-of-the-art machinery



REISHAUER

HYUNDAI
WIA

LIEBHERR

Gleason

 **Profilator**
QUALITY MEETS SPEED


escofier

MORI SEIKI

 **HÖFLER**
A BRAND OF KLINGELNBERG

ASSAG | 15 **AVTEC**

OTHER PROCESSES

Cornerstones of a Best Cost Manufacturing: Inhouse capabilities

- **Fully-fledged in-house Heat Treatment facility** (Hardening / Nitriding / Nitro Carburizing / Case Carburizing / Carbo Nitriding / Plug-Quenching / Normalizing / Iso-Thermal Annealing / Induction Hardening / Super Cooling)
- **Latest technology** on Laser Beam welding
- **Automated machines with robotics**
- **Testing & Validation** for engines & transmissions
- **Metrology & Metallurgy**
- **up to the highest quality classes**



PRODUCT PORTFOLIO

Components

▪ Gear & Family



Segment: Automotive, Off-Highway & Railway

Type: Spur & Helical

Products: Crown gear, round gear, sun gear & pinion gear

Diameter Range: 30 - 500 mm

▪ Shafts & Hollow shafts



Segment: Automotive & Off-Highway

Type: Rolled splines (Solid & Hollow), with gear teeth

Products: Cluster gear shafts, hollow shafts & shafts with synchro cones, pinion assemblies, input & output shafts

Length: 50 - 600 mm

▪ Ring gears



Segment: Automotive & Off-Highway

Diameter Range: up to 600 mm (external), 100 - 500 mm (internal)

Height: up to 150 mm

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PRODUCT PORTFOLIO

Components

▪ Shift sleeves



Segment: Automotive

ID Range: max. 110 mm

▪ Planetary carrier



Segment: Automotive & Off-Highway

Types: Single deck & double deck construction, single piece, fastened design & welded design with shafts integrated

Diameter Range: 100 – 450 mm

Height: 100 – 400 mm

▪ Differential case & assembly



Segment: Automotive & Off-Highway

PRODUCT PORTFOLIO

Components

■ Skid steer axle



Segment: Off-Highway

Major sub-components:
Axle housing, axle spindle,
bearings and oil seals

■ Synchropack



Segment: Automotive & Off-Highway

Types: Single & Multi cone, Double & Triple cone

Sub-components: Sleeve, hub, inner ring, intermediate ring, outer ring, dog crown, synchro ring, inserts

Diameter Range: 70 – 100 mm

■ Clutch drive assembly



Segment: Railway

Major sub-components: Central support drive, plate cam, turbo gear, clutch dowel, upper idler gear

PRODUCT PORTFOLIO

Components

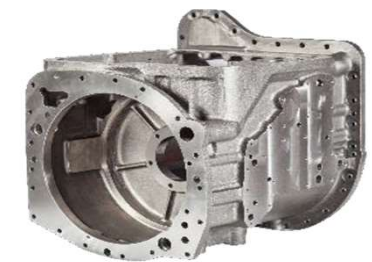
■ Housings & Transmission covers



Segment: Off-Highway & Oil rig applications (Large) / Passenger Cars, SUVs (Automotive)

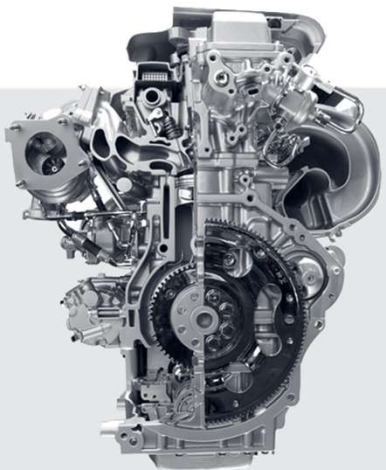
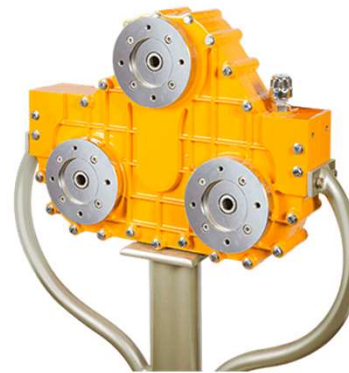
Types: Main housings, converter housings, retarder housings, covers / Main housings, front & rear housings, covers

Material: Cast iron / Aluminium (HPDC / LPDC)



PRODUCT PORTFOLIO

Next Generation Engines & Transmissions



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CUSTOMER REFERENCES

Excerpt from our global customer list



Mercedes-Benz



VE COMMERCIAL VEHICLES

CATERPILLAR



Mahindra
Rise.

DAIMLER

ISUZU



ALSTOM



EATON

rexroth
A Bosch Company

ABB



SAIETTA
ELECTRIC DRIVE



BOSCH



TEREX



KION
GROUP

SIEMENS Gamesa
RENEWABLE ENERGY

BARTHOLET



KLEEMANN

LIEBHERR

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