Innovations of Great Value.

Industrial Drives
ZF is a Leading Worldwide Automotive Supplier for Driveline and Chassis Technology.

In order to be successful with industrial drives and actuating systems, you need partners who understand your visions and who are flexible enough to turn your ambitions into their own ones. With the Special Driveline Technology business unit, ZF Friedrichshafen AG has created a business area that focuses exactly on this specific mission.

We are developing and producing adaptations of large-scale volume production products as well as individual, customized drive solutions, transmissions, clutches, and brakes and thus, we actively contribute to the realization of your ideas.

Over decades, we have gained know-how in the fields of mechanical engineering; we constantly exchange information with the ZF research and development center and we are using latest technologies. Moreover, internal ZF company processes highlight the recognized high quality level of the automotive industry. Expertise and process quality that our customers will benefit from. The result: Innovations of Great Value.

Dr. Thomas Hegel
Vice President Special Driveline Technology

“The one who wants to establish innovative products on the market must cooperate with trendsetters, and, simultaneously, needs to have an enthusiastic attitude! Just as the employees of the ZF Special Driveline Technology business unit who, with their innovative products, truly make the world go around.”
“We are focusing on the core business,” is what renowned manufacturers of e.g. printing machines, textile machines, and machine tools say, leaving the development and manufacture of customized machine drives, clutches, and brakes entirely up to the ZF Special Driveline Technology business unit. They are trusting in our expertise. And they know about the operating efficiency of our products.

Even under continuously high machine loads, ZF machine drives work in a highly reliable and precise manner. Their size is so small and their weight so low that they can be smoothly integrated into the respective machine concept. Low-scale maintenance efforts and longevity warrant high machine availability.

ZF hysteresis components – brakes, clutches in combination with control electronics – are applied wherever tractive forces need to be exactly regulated and defined torques are precisely set to a point: E.g. when processing paper or wire in winding/spooling processes or in the case of load simulations at test benches and in ergometers.

In addition to a high setting accuracy and the wide torque range, this technology – also called ZF-Tiratron – excels through non-contact, zero-wear torque transmission.
Machine Tools

Today, a machine tool must be universally applicable in order to process different materials. The two-speed ZF-Duoplan manual transmissions live up to these demands.

Power + Dynamics
High cutting speeds are needed for soft materials and major cutting forces for hard materials. This level of flexibility can be obtained through the application of a shiftable transmission. On the one hand, the high speeds of the drive motor in the direct gear (i = 1:1) are maintained and on the other hand, the motor’s drive torque is multiplied via the ratio (e.g. i = 4.00) while the speed is respectively reduced.

Flexibility
The cutting performance remains constant and is made available for a broad speed range. Only by means of a transmission, this level of flexibility is achieved in a profitable manner.

Direct spindle mounting
(INLINE + TSC Through-Spindle-Cooling)
These transmissions are directly mounted to the spindle and therefore, no belts are needed. Moreover, these transmissions were specially designed for top quality requirements in the fields of machine tool engineering. By means of the TSC, emulsions, hydraulic oils, or air-oil mixtures up to 140 bar at 35 l/min can be fed directly through the transmission and the spindle to the tool.

High-speed
The high-speed model range is used for higher speeds of up to 20,000 rpm; it features particularly smooth running and lowest possible temperature development characteristics.

Inking unit cutoff:
Turns off the complete inking unit. Shifting down the inking unit improves the range of options for universal application and reduces setup times. Scope of functions: The single-pointed tooth clutch is pneumatically engaged. The clutch is integrated in the transmission.

Doctor unit:
Controls the ink volumes transferred from the inking accumulator to the printing plate. ZF scope of functions: Planetary gear set with disk cam geometry at the outer diameter. Superimposed axle drive that – under load and speed – enables setting between the drive and output.

Damping system:
Processing of humidity and cleaning of printing plate for the next printing process. ZF scope of functions: 2-speed countershaft transmission with power-shiftable multidisk clutch and integrated pneumatic shift cylinder.

Special transmissions for printing machinery
Leading manufacturers trust in ZF. They can be sure that at ZF, complex installation situations and system requirements are well understood. Thanks to ZF’s know-how in the fields of transmission technology, you can always expect customer-specific systems for printing machinery that, in a highly profitable manner, will live up to your expectations. These transmissions operate in the inking unit, distributor, and in the damping unit; they are optionally engageable.
Textile machines
Here, it is primarily velocity that counts. The higher the speed, the more comprehensive are the requirements relating to clutch-brake combinations that will be able to immediately – at lightning speed – stop machines and to reaccelerate them. In this context, ZF brakes and clutches excel through swift and safe separation; there is no residual torque and they are insensitive to soiling and thermal overload.

Forming technology
Four ZF-Servoplan transmissions of different model sizes are used in e.g. modern wire bending & forming machines that, for example, produce wire-formed parts for the automotive industry. Servoplan transmissions excel through their low-play toothig and thus, they are specially suited for exact, accurate positioning tasks.

Packaging technology
Labeling machines with a high level of flexibility, simple and easy operation, cleaning and maintenance processes, low consumption of glue, and a high level of availability run with ZF hysteresis brakes and clutches as well as with ZF-Servoplan transmissions. Machinery featuring such equipment is operated in a maintenance-free manner and thus secures stable production processes. Industrial goods up to foodstuff are exactly positioned, safely packaged, and palletized in packaging machines thanks to ZF-Servoplan transmissions.

The advantages of the ZF-Servoplan model range are:
- Low running noise
- Maintenance-free thanks to lifetime lubrication
- Ultra-high levels of positioning accuracy with ground, high-precision gears
- Low transmission temperatures and minimal power losses thanks to the lowest possible diameter applicable with sealing rings

Pipe bending machinery
ZF-Servoplan transmissions are working in a highly precise manner, with great dynamics, and they warrant exact and accurate reproducibility of the bending result. Machinery energy costs are decreasing thanks to the transmissions’ high level of efficiency.

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Medical technology
Electromagnetically actuated ZF single-disk clutches and brakes are used in X-ray systems, for particularly smooth and power-saving positioning of commercial radiation / blending combinations and for quicker centering of take-in positions.

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ZF-Tiratron Hysteresis brakes and clutches:
The torque depends upon the current strength Slip and synchronous torque can be adjusted in a continuously variable manner from 0 to the maximum value. E.g. for winding or unwinding of continuous products (filament, wire, paper, foil).

ZF-Single-Disk
Thanks to their technical advantages, their respectively simple setup and their opportune outside dimensions, electromagnetically operated single-disk clutches and brakes are increasingly used for the automation of mechanical working processes.

Hysteresis brakes are offered in relation to model sizes to the target torques of 0.05 – 520 Nm. Braking performances of up to 2000 W can be attained for continuous operation as well as 4000 W for shortterm operation (interval operation). These components can be used for continuous slip operation and also as a holding brake.

Hysteresis clutches encompass a target torque range of 0.4 – 12 Nm. The maximum continuous slip performance resides at 500 W. It is characterized by a continuously variable transition from synchronous to (continuous) slip operation.
Comfortable and Safe: ZF transmissions for elevator and materials-handling technology

Modern architecture is increasingly heading towards heights. With the number of floors of a building, the requirements vis-à-vis elevator and materials-handling technology are rising simultaneously. ZF transmission systems make a vital contribution to safely and comfortably overcoming constantly expanding distances.

The one taking the elevator or the escalator wants to reach the destination quickly and swiftly. ZF transmission systems have been designed for powerful motors and high input speeds. However, velocity is not an end in itself. As a result of the high smooth running characteristics of our products, persons and loads are comfortably transported at low-noise. Riding comfort and, at the very same time, a safe feeling are conveyed – just as ZF product quality. The loading capacity of our transmission systems has been checked in the course of continuous testing sequences.

Moreover, premium quality work is warranted through high ZF methodology expertise. Insights gained during field experience is consistently fed into ZF’s new product development.

In addition, product quality is guaranteed through strict quality management throughout the company that has been duly recognized in accordance with the DIN EN ISO 9001:2000, ISO/TS 16949 certificates and the supplier evaluations.

Comfortable and Safe: ZF transmissions for elevator and materials-handling technology

ZF-Ecolift
The ZF-Ecolift elevator transmissions were developed for use in passenger and goods elevators. They differ considerably from the previously used transmissions in rope-drawn elevators. Instead of a worm gear transmission, the ZF-Ecolift – two-stage planetary gear set – transfers the power from the electric motor to the traction sheave. The ZF-Ecolift elevator transmission is suitable for use with motor speeds of 3000 rpm and operating speeds of up to 4 m/s. A high level of efficiency enables the use of smaller electric motors and thus provides for energy and cost savings. These transmissions operate almost entirely without mechanical wear because the tooth flanks are designed for endurance strength. The higher smooth running characteristics are warranted thanks to helical-cut planetary stages.

Transmissions for escalators
Escalators conveniently link the floors of many buildings and public facilities in a safe manner. Equipped with a ZF escalator drive, they live up to the high requirements in terms of safety and smooth running in an outstandingly impressive manner.

The high efficiency level ensures optimal energy efficiency. Over its entire lifetime, the transmission runs in a maintenance-free way. This helps to preserve the environment and reduces operating costs at the same time. Thanks to the coaxial installation, the installation space of the overall drive unit is minimized. The transmissions are designed as two-stage planetary gears and were developed for a ratio range of: \( i = 1:100 \).
Individuality is a standard we offer. We are developing and producing customer-specific drive solutions – for the automotive sector as well as for e.g. future technologies focused on renewable energies. And this most certainly without striking compromises: Our customers know best what they want – therefore, as our customers, you will be part of our development team. Together, we are designing a product that is specifically tailored to fulfilling this task.

As a ZF customer, you are benefiting from the creative potential of our specialists just as from the corporate research and development work of a globally operating company of the automotive industry. The benefits and the market success are for ZF the scale for the development of innovative technologies. We would like to support you in achieving your targets – for securing and expanding existing market shares as well as when opening up the markets of tomorrow. With our expertise, ideas, and our multifold experience. We are thinking in a highly flexible way, across the limits of our industry, and develop innovations that make the world go around – small as well as big ones.

Dwindling energy resources and global warming enforce a new approach. The energy consumption and pollutant emissions of vehicles and facilities must be reduced. At the very same time, innovative technologies must be developed for the use of renewable energies.

In both cases, dynamic, mechatronic ZF actuating systems provide good services. They are highly versatile and prove convincing in terms of high energy efficiency when compared to hydraulically or pneumatically triggered actuators. Fields of application for ZF actuating systems can be found in the closer vicinity of combustion engines, chassis technology, with PTOs, or nearby trend-setting energy technologies. Here, if needed in addition to modern drive concepts, a complete sensor system can be furnished, including measurement and control systems: The system is our particular strength.
For us, good service is more than just traditional after-sales support. It encompasses the entire life cycle of our products and, from development to recycling, it covers all services. The provision of test equipment and product training on site belong to the ZF scope of services as well as the availability – usually over decades – of genuine spare parts.

119 Production Companies
Europe: Germany 29, France 7, Great Britain 3, Italy 4, Austria 2, Russia 1, Slovakia 3, Spain 5, Turkey 2, Hungary 3
North America: Canada 1, Mexico 3, USA 15
South America: Argentina 1, Brazil 5

Asia-Pacific: Australia 2, China 19, India 1, Iran 1, Malaysia 1, South Korea 2, Taiwan 1, Thailand 1
Africa: Algeria 1, South Africa 6

6 Main Development Locations, 27 Sales and Service Centers, 17 Aftermarket Trading Companies, 2 Representative and 12 Marketing Offices, more than 700 After Sales Service Points worldwide

Status 2007

The high skills level attained by its employees is therefore a core success factor for ZF. Employees have a key role to play in the success of the company by identifying future requirements at an early stage and by devising appropriate solutions for its customers. They are the backbone of ZF’s ability to innovate and to compete. The high quality of ZF products and the unique development capabilities of the Group are the result of targeted personnel development and skills training. Management, teamwork, experience, specialist knowledge, and personal responsibility are all directed consistently towards the goals of added value and customer benefits.

Quick and Comprehensive: ZF Service

A leader in technology, quality, and service, while still remaining competitive. This is not a contradiction in terms – it is just plain common sense. Every single day, the employees at ZF face up to this challenge in order to meet these high standards.

Standstill is expensive. In order to warrant high machine availability to our international customer base, we are designing products that live up to the required load requirements while being, for the majority, maintenance-free. If however, problems do occur, we ensure through our close-knit ZF service center network as well as ZF representatives that quick and competent service is provided on a global scale.

ZF: A brand that stands for global motion – products, services, and people.