Chains and Sprockets for the Automotive Industry

Products for all conveyor processes in the automotive industry
For over 80 years, KettenWulf, as an expanding global company, has stood for quality, reliability and flexibility. More than 1200 employees develop, produce and market customized solutions in the field of conveying and drive technology at ten locations across Europa, America and Asia. All around the globe, KettenWulf is your strategic partner when it comes to delivering optimum product quality.

Trust, loyalty and commitment – these values are what KettenWulf stands for. As a medium-sized, family-run company, cultivating a strong, personalized partnership with both our customers and suppliers is our highest priority.

Be it the Sauerland, Hangzhou, Atlanta or Pune – as an international company with worldwide operations, our employees are always at your service to meet your unique business needs and to provide you with industry leading technical support.
We are partners of the automotive industry

KettenWulf offers innovative conveyor chain technology for all applications in the automotive industry.

An ideal machine uptime and equipment availability, with minimal maintenance effort, are the prime requisite for a smooth production flow in the automotive industry.

KettenWulf chain technology contributes to ensuring optimum manufacturing efficiency and safety on a sustainable basis. For decades, notable car manufacturing companies and the respective OEMs have put faith in KettenWulf drive and conveyor technology, because we very much understand the requirements of the automotive industry.

In our company we combine the individual performances and capabilities of all our departments, be it Research & Development, Production or Assembly to achieve the best product for your individual transport and conveying needs. Based on our profound know-how and expertise for this particular industry, we are able to provide innovative chain solutions which not only have economical but also ecological production advantages. Today our customers can already benefit from our low-maintenance and lube-free technology.
Chains and sprockets for all conveyor processes in the automobile production

Chains for cross transfer

Chains for longitudinal transportation

Chains for submerged body conveying

Chains for slat conveyor
The cross transfer conveyor connects separate conveyor lines, meaning that the transported material is removed from one conveyor line and laterally transferred to the progressing conveyor line.

Cross transfer conveyors are commonly used in various areas of the automotive production and connect the individual production processes.

High reliability is essential to ensure a smooth and fast transition between the production steps.

Chains for cross transfer

Cross transfer conveyor in the paint shop
Cross transfer applications

In the various production areas, the cross transfer chains are modified for the individual applications. In general, lube-free chains are predominantly used for this purpose. For other requirements such as resistance to overtravel by forklifts or droppings from car bodies, KettenWulf is able to supply the right chain. Additionally, cross transfer conveyors near to working places can be equipped using sprockets with a special noise dampening system for a better work environment.

Illustration 1: Lube-free cross transfer chain, 160 mm pitch
Illustration 2: Covered, lube-free cross transfer chain
Illustration 3: Lube-free cross transfer chain, 80 mm pitch
Illustration 4: CCS-chain, 6" pitch
Illustration 5: Sprocket with patented noise dampening system
Illustration 6: Lube-free roller chain for cross transfer conveyor in body shop
Car bodies travel through several rather different production steps in an automotive plant such as grinding, painting and drying. Usually the car bodies are moved lengthwise with skids or support frames. Depending on the client specifications, the appropriate chains are equipped with devices which are specifically designed to catch the skids or support frames and move them along.

Furthermore, it is possible to engineer other special requirements for your chain application:

» use special non-stick coatings on the chains,
» make the chains lubrication-free,
» implement accumulation top rollers for buffering,
» make the chains to withstand temperatures of up to 250 °C/482 °F.

Chains for longitudinal transportation

Accumulation chain in the paint shop
Longitudinal conveyor – spray booth

To cope with the difficult environment in a spray booth, KettenWulf has developed solutions to make the production flow substantially easier. For example, our chains can be equipped with profiled C-shaped carrier pieces, prism-shaped supports for a better transition or chains with welded-on slats for protection against overspray.

For an easier cleaning, chains can be provided with a non-stick coating.

At high chain speeds our patented noise dampening system will reduce the noise at the sprockets considerably.

Illustration 1:
Double-strand deep link chain

Illustration 2:
Chain with welded-on support plates (loose side)

Illustration 3:
Spray booth chain with welded-on top plates

Illustration 4:
Chain with prism-shaped supports (fixed side)

Illustration 5:
Spray booth chain with sealed bearing rollers to minimize surging

Illustration 6:
Sprocket with patented noise dampening system
Longitudinal conveyor – oven application

After coating, the car bodies are moved through an appropriate oven, wherein the temperatures can reach up to 250 °C/482 °F.

For this application, oven chains are used to move the skids or support frames with the car bodies through the oven. For irregularities with the skid positioning, these chains are very often supplied with a fixed and a loose side.

Chains with outside mounted rollers are especially suitable for lube-free technology.

With lube-free oven chains, every component will be designed to operate under the given temperature ranges.

**Illustration 1:** Oven chain with inside mounted rollers for fixed side

**Illustration 2:** Equivalent oven chain for loose side

**Illustration 3:** Oven chain with outside mounted rollers (fixed side)

**Illustration 4:** Equivalent oven chain (loose side)

**Illustration 5:** Lube-free oven chain with mounted top plates

**Illustration 6:** CCS-chain, pitch 6″
Longitudinal conveyor – buffering

To compensate different production figures of the individual lines, conveyors for buffering are required. These buffering lines store the car bodies and are equipped with accumulation chains.

Such systems are very robust and therefore a cost-effective alternative. Depending on the load, the high roller sequence can be chosen flexibly to your load requirements.

**Illustration 1:**
Lube-free accumulation chain with high roller and guide-wheel strip combination

**Illustration 2:**
Lube-free accumulation chain

**Illustration 3:**
Lube-free accumulation chain with two high rollers for skid carriage

**Illustration 4:**
CCS-B chain with high rollers
Prior to the coating steps of the Paint Shop, the car bodies need to be chemically cleaned. During the Pre-Treatment they pass through several consecutive dip tanks.

Afterwards, the first coating – the Cataphoretic Dip Paint – is carried out in another dip tank.

For both processes two different chain conveyor systems are utilized:

- » RoDip-conveyors
- » Pendulum conveyors

Chains for submerged body conveying

Submerging of a car body in a dip tank
In the RoDip-system the chains are operated horizontally and only have to pass through sprockets at the conveyor end for circulation.

The car bodies are moved through the dip tanks by rotation. For this, the RoDip chains are equipped with rotational supports where the car bodies are locked with their individual rotary axles.

Illustration 1: Rotation tunnel with rotary axles and RoDip chains at each end

Illustration 2: Car body during rotation

Illustration 3: RoDip chains: At the rotation supports the load is carried by ball-bearing support rollers

Illustration 4: Low-maintenance chain hinge with the KettenWulf Sandwich-Sealing System

Illustration 5: Rotation support rollers

Illustration 6: Return sprocket for RoDip-system
Pendulum conveyors

**Pendulum conveyor with sprockets**

In this type of application the pendulums are fixed to the pendulum chain. The chain is returned using a sprocket system.

Specifically engineered sprockets from KettenWulf are used particularly in such conveyors. These engineered sprockets have many advantages over ordinary sprockets since changing a rim or a tooth gap insert saves both costs and down time.

**Pendulum conveyor with return arches**

Pendulum conveyor chains for return arches have outside-mounted rollers with ball-bearings, which run in U-profiled track systems. These chains are not driven by sprockets, but by means of a caterpillar chain.

**Illustration 1:** Pendulum conveyor chain in the Pre-Treatment system

**Illustration 2:** Sprocket with exchangeable tooth gaps

**Illustration 3:** Pendulum conveyor chain in the Cataphoretic Painting dip tank

**Illustration 4:** Pendulum conveyor chain with rollers located at the middle of the chain pitch

**Illustration 5:** Pendulum conveyor chain with rollers located over the chain bushings

**Illustration 6:** Lube-free pendulum conveyor chain
Lubrication-free and low-maintenance pendulum chains

The chain hinges of a pendulum chain can be built in a lubrication-free or low-maintenance execution. Due to the harsh environment with the pre-treatment chemicals and the cataphoretic paint, the chain hinges of low-maintenance chains should be protected with our patented Sandwich-Sealing System. This system shields the grease in the pin and bushing areas from infiltration of chemicals or paint and thus allows for longer re-lubrication intervals.

Moreover, the Sandwich-Sealing System not only protects the chain hinges and reduces grease consumption, but also improves your painting results considerably since there is less old grease in your system. Lube-free chains are properly sealed by the Sandwich-Sealing System to allow for a smooth chain operation. No lubrication is required.

Illustration 1: Sandwich-Sealing System with interior lip sealing

Illustration 2: Re-lubrication system with the Sandwich-Sealing System

Illustration 3: Sandwich-Sealing System for lube-free chains

Illustration 4: Lube-free chain with the Sandwich-Sealing System
Slat conveyors are used for transportation of car bodies on skids for assembled vehicles in several parts of an automotive plant:

- Body Shop grinding operation
- Final Assembly
- Finishing and Fluid Filling
- Water Test
- Conservation

For slat conveyors, primarily lubrication-free chains are used due to accessibility issues, lower maintenance effort, and less contamination caused by old grease, e.g. washing water of water test conveyors.

Chains for slat conveyors

Double-strand slat conveyor in a finishing line
Slat conveyors – body shop

In this department the car bodies are moved with skids or support frames. A re-lubrication of the chains is especially problematic in this application since abrasive grinding dust is swept into the chain hinges by the oil from the lubricator. Therefore, KettenWulf has developed specific lube-free slat conveyor chains, which also use the patented KettenWulf Sandwich-Sealing System for a smooth operation of the chains.

Illustration 1: Sandwich-Sealing System for lube-free chain executions

Illustration 2: Chain hinge with the Sandwich-Sealing System in a conveyor with grinding dust exposure

Illustration 3: Lube-free double-strand chain with outside mounted rollers

Illustration 4: Chain hinge with flanged rollers and the Sandwich-Sealing System after several years of grinding dust exposure

Illustration 5: Lube-free double-strand chain with inside mounted rollers
Slat conveyors – finish area, fluid filling and final product inspection

Due to ergonomic reasons, in this section of the plant, it is usually necessary for staff and equipment to move along with the vehicles. This is why the slat conveyors can have a width of up to 4m/12ft.

In the Fluid Filling area, the chains can be protected against spills and droppings by coatings and sealing systems. Lubrication-free technology is also available.

Illustration 1: Slat conveyor with 4m/12ft. wide slats in Finish Area

Illustration 2: Two double-strand chains in combination with two single-strand chains

Illustration 3: Slat conveyor in the Finish Area and Fluid Filling, with staff standing on the conveyor

Illustration 4: Installation of double-strand chains in a new automotive plant

Illustration 5: Double-strand conveyor in Final Product Inspection line

Illustration 6: Double-strand conveyor chain with mounted wheel carrier plates
Slat conveyors – final assembly

Requirements are toughest in final assembly lines where the conveyors usually are the longest and see high level wheel loads. To cope with the given process parameters, KettenWulf designs and engineers special conveyor chains according to the requested specifications.

**Illustration 1:** Automatic wheel assembly with double-strand chain; vehicles standing on their own wheels for the first time.

**Illustration 2:** Double-strand chain with wide slats for twin wheels

**Illustration 3:** Finish Line with a shaft distance of 173m, conveyor speed 0.8m/min

**Illustration 4:** Double-strand chain with mounted carrier plates
Due to contact with washing water, the conveyor chains for Water Test Conveyors are primarily made of stainless steel. Ideally, these chains should be lube-free and equipped with the Sandwich-Sealing System and sealed rollers to avoid contamination of the washing water with lubricants.

After Final Assembly and Water Test some vehicles pass through the Conservation area for wax coating to protect them for overseas shipping. KettenWulf lubrication-free technology ensures a high process-safety since the conveyor chains can operate without being impacted by external factors.
KettenWulf sprockets

KettenWulf produces sprockets in various dimensions and designs according to customer requirements.

Sprockets are a critical factor for the capacity and endurance of every chain system. In order to ensure the quality of all products, KettenWulf relies on the production of their own sprockets.

Besides sprockets with DIN/ISO/ANSI gearing, our product range also covers individual solutions for the automotive industry. For instance, the use of KettenWulf sprockets with segmented tooth rims or exchangeable tooth gaps ensures a considerable reduction of maintenance costs and downtime. Moreover, the patented KettenWulf noise dampening technology allows for better and healthier working conditions.
Optimum tooth forms for all chain types

KettenWulf provides matching sprockets for all applications and chain types, be it with DIN standard tooth forms or optimized tooth shapes.

For maximum service life, we only use high-grade material and state-of-the art production technology.

Parts of the sprocket such as tooth rims or tooth gaps can be heat-treated or induction-hardened for a better surface hardness.

**Illustration 1:**
Sprocket for RoDip-chain

**Illustration 2:**
Sprocket with exchangeable tooth gaps

**Illustration 3:**
Sprocket with patented noise dampening system

**Illustration 4:**
Sprocket with a three-segmented sprocket rim

**Illustration 5:**
Split sprocket with one-sided hub

**Illustration 6:**
Sprocket for roller chain