



THE GROUP

With 23 companies in 18 countries, the Witzmann Group is the world's leading expert in the safe and efficient management of media and energy for mobility and industry. According to our company motto "managing flexibility", we offer the world's broadest range of products and are an experienced development partner for complex solutions. With flexible metal tubes, expansion joints, metal bellows, pipe supports, vehicle parts and piping systems, Witzmann provides its customers with intelligent product solutions and services from a wide variety of industries.



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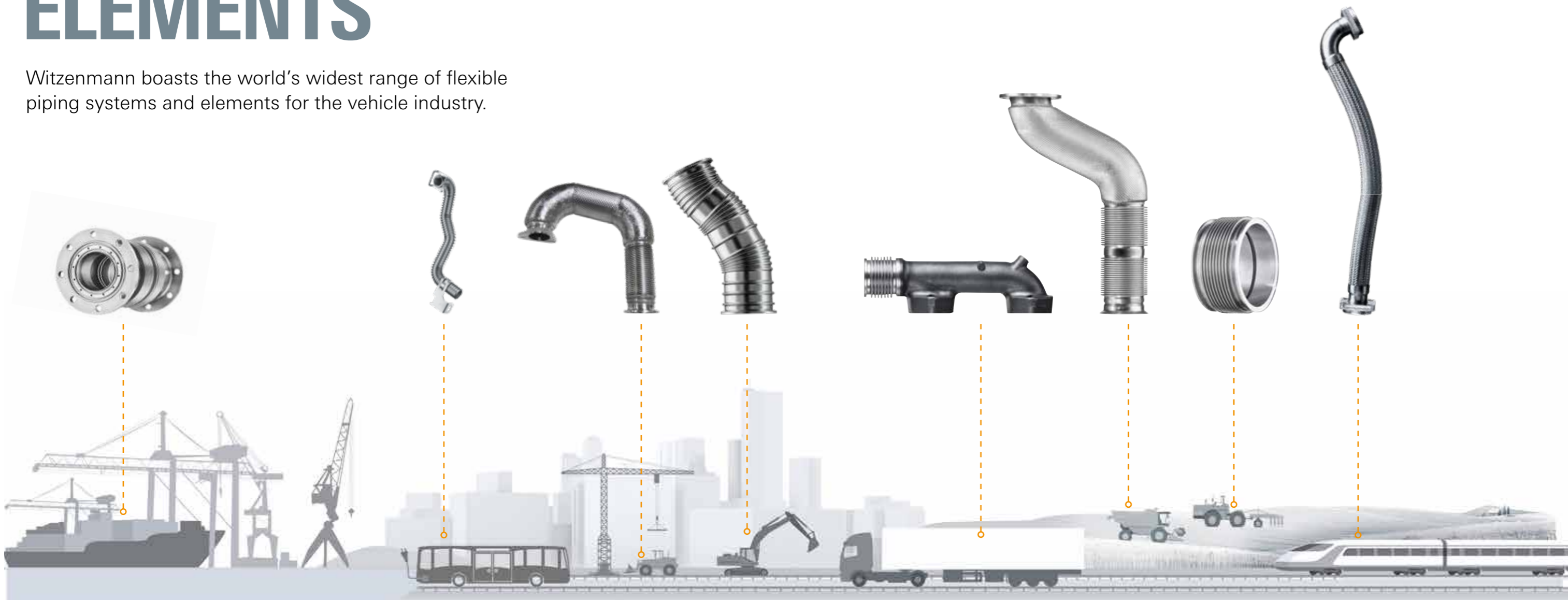
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FLEXIBLE ELEMENTS FOR ON- AND OFF-HIGHWAY



FLEXIBLE ELEMENTS

Witzenmann boasts the world's widest range of flexible piping systems and elements for the vehicle industry.



In internal combustion engines, flexible elements are used in the exhaust gas area, downstream of the turbocharger and in pipelines directly on the engine. They absorb thermal expansion, oscillations and low-frequency movements. All components meet the strict emission standards such as Euro 6 and in the future Euro 7 or the IMO Tier V regulations.

In electromobility, our product solutions are used in the thermal management of electrical aggregates as safety lines for shielding and protecting electrical lines.

Large engines

Large engines are mainly used as ship drives or stationary engines and may be diesel, gas or dual fuel engines. Robustness and a very long service life are important quality criteria for our flexible pipework elements in large engines.

New Energy Vehicles

Whether e-mobility, fuel cells or hydrogen technology – our components are also in series production here. One aspect of our research and development work also focuses on completely new approaches such as cooling motor housings or thermal management of batteries.

Construction / Agricultural machinery

The main requirements for our components in this area are a long service life and compliance with increasingly strict emissions regulations. Apart from decoupling elements, piping systems with rigid and flexible components and gas-tight elements and systems, such as corrugated hoses or metal bellows, are used here.

Trucks/buses/transporters

Just like in the automotive industry, strict emission standards also apply here. As a leading manufacturer of pipelines, we have a developmental and manufacturing competitive lead. For the exhaust gas area, decoupling elements or expansion elements of different designs are manufactured that decouple vibrations, thermal expansions or engine movements.

Exhaust gas recirculation helps to significantly reduce pollutant emissions. In oil and cooling circuits, the benefits of flexible metal pipelines include their absolute gas and diffusion tightness, long service life and temperature resistance.

Rail Vehicles

Flexible metal tubes, bellows or exhaust gas expansion joints have many fields of application in the railway industry. Examples of this are the use in transformers, cooling systems, air conditioning systems, brake and hydraulic systems, brake systems, exhaust gas systems and engine supply lines. These are usable almost universally thanks to different connections.

ENGINEERING AND INNOVATION

Know-how

As a technology leader, we have a high level of development competence. The possibility of computational model representation and fast, high-precision test bench technology support us in product development and the continuous improvement of our products. This allows us, for example, to represent an entire vehicle life on the test bench within a few days.

Large and small series

The globally linked manufacturing network of the Witzemann Group enables sustainable and efficient production directly on site. Large series as well as small pilot series can be implemented quickly and reliably.

Innovative spirit

Over 2,800 patents shape the history of Witzemann, including new, innovative product solutions for New Energy Vehicles.

Application know-how

We operate in a wide range of markets. From aerospace to medical technology. This is why we are valued lateral thinkers when it comes to developing new and reliable solutions.

Service

We use our established experience to support our customers in system design and validation. Our materials and process experts work hand in hand to solve highly complex tasks. We deliver just-in-time directly to the assembly line, tailored to the respective processes.



Reduction of the construction weight

Saving weight while simultaneously achieving higher performance is one of our motivations for continuously improving that which already exists. For this purpose we use new materials, processes and techniques.

Long service life

Designed for the life of a vehicle and for robust use under the toughest conditions, our rigid and flexible pipework elements and systems ensure long-lasting reliability.

Sustainable production

We mainly process stainless steel, which is 100 % recyclable. Our flexible pipelines ensure that media is routed safely – under pressure, in a vacuum, in hot and cold environments.

Continuous product evolution

In order to have the right answers to the steadily increasing requirements and stricter legal standards, Witzemann is investing heavily in product research and further development. This is one reason why we are valued by our customers as a development partner well in advance of new series.

Certified

We are certified by reputable approval companies worldwide. Our internal quality management ensures that all Witzemann Group sites meet the high standards and demands that our customers place on Witzemann products.

Global presence

We are present wherever our customers are as well. With production and consultation. A claim that stands for sustainability and quality, worldwide with 23 companies in 18 countries.

FLEXIBLE AND RIGID PIPEWORK ELEMENTS

Witzenmann is the world's leading manufacturer of flexible and rigid pipework components for classic combustion engines (diesel, gas and dual fuel drives). By continuously developing our products, we help to further reduce CO₂ emissions.



UPSTREAM OF THE TURBOCHARGER



Exhaust gas expansion elements

Exhaust gas expansion elements are used before or between the turbochargers to compensate for thermal expansions in the manifold or downpipe area.

- single or multi-layer bellows ensures a gas-tight solution
- optionally with wire mesh ring as vibration damper
- customised connections
- available in all common connecting diameters



Ducts in the manifold section

Exhaust expansion elements are bellows that compensate thermal expansions, movements or assembly tolerances. They are used in the manifold areas upstream of the turbochargers.

- single or multi-layer bellows ensures a gas-tight solution
- optionally with wire mesh ring as vibration damper
- customised connections
- available in all common connecting diameters
- optimally even at high temperatures and pressures



Exhaust gas recirculation pipe

Exhaust gas lines help to reduce pollutant emissions from combustion engines in order to meet the strictest laws.

- design according to customer specifications
- preferably with a corrugated section
- with or without bending in the plain tube or corrugated section



Exhaust gas recirculation pipe with ultra-fine filter

Exhaust gas lines help to reduce pollutant emissions from combustion engines in order to meet the strictest emission standards.

- design according to customer specification in the low pressure EGR range
- preferably with silencer
- with or without bending in the plain tube
- connection via flange, V-band clamp connection, casting or deep-drawing parts according to customer specification

DOWNSTREAM OF THE TURBOCHARGER



Decoupling elements/hose assemblies

In the exhaust gas sector, decoupling elements of various designs are used. They absorb vibrations, thermal expansions and engine movements.

- universal applications
- with round or oval cross-section
- temperature and corrosion-resistant by suitable selection of materials
- available in all common connecting diameters



Stripwound hoses

Stripwound hoses with interlocked profile or corrugation profile are frequently used in exhaust gas systems for light and heavy lorries, buses, construction machinery or fork lifts.

- adequately technically gas-tight, low leakages
- insensitive to torsion movements



Structure-borne noise decoupling elements

Structure-borne sound decoupling elements consist of a short self-supporting compact bellows, which optionally has an external wire cushion for damping purposes. They are used for decoupling high-frequency vibrations and for compensating assembly tolerances as well as for absorbing thermomechanics.

- multi-ply bellows
- with wire mesh ring as vibration damper
- flow routing via flame tube
- on request, including customer-specific connectors, e.g. V-band clamp connection



Piping systems in the exhaust gas sector

Piping systems optionally consist of segment and/or bare pipe elbows which are manufactured up to DN 150 with or without insulation.

A bellows or stripwound hose is used as a flexible metallic element.

- geometric and technical characteristics as well as the connection technology can be adapted to the particular customised mounting situation
- temperature, pressure, corrosion and ageing-resistant

FLUID SYSTEMS: OIL, WATER, COOLING CIRCUIT



Pipework elements for oil and water circuits

Close-coupled and temperature-resistant media supply for the feed and return of oil water and other fluids.

- preferably with a corrugated section
- with or without bending in the plain tube or corrugated section
- compensation of vibrations, thermal expansions, assembly tolerances
- technically gas-tight
- temperature-resistant/corrosion-resistant thanks to suitable selection of materials



Piping systems in the cooling circuit

The restricted mounting space in the area of the refrigeration systems, for example in the transformer oil cooling circuits, places high demands on the geometrical and technical characteristics of the flexible systems.

- compensation of thermal expansions and assembly tolerances, decoupling of vibrations
- temperature and corrosion-resistant thanks to suitable selection of materials and multi-ply structure



Corrugated hose fluid

- flexible piping systems
- inert to media
- gas-tight
- pressure-resistant
- connection to flange, screw or according to customer specification

APPLICATIONS FOR NEW ENERGY VEHICLES

A team of specialized engineers from our prototype production and the test departments is developing trend-setting product solutions for New Energy Vehicles (NEV) in cooperation with our customers. Such as for electromobility, hydrogen or fuel cell technology. Here we draw on our many years of experience and knowledge of the market.

NEW ENERGY VEHICLES



Applications for hydrogen

- fuel cell, medium and low pressure range
- customer-specific certified stainless steels
- extreme safety: designed for pressures of 10-20 bar; burst pressure testing over 500 bar
- 100% helium leak-tested components
- customised weld certificates and specific certificates of approval of the respective welder



Battery discharge lines

Gas discharge lines are used when the batteries must be degassed within 5 seconds. In the process, temperatures of up to 700 °C occur.

- suitable for 48 volt on-board vehicle power supplies and for high-voltage batteries in hybrid vehicles
- technically gas-tight



Cooling jacket for electrical motors

- lightweight construction by means of thin-walled metal structure
- integrated, optimised flow routing



Battery thermal management

- arrester cooler
- functional integration of heat dissipation and bonding
- cell temperature control
- cooling jacket for extensive heat transfer