

Flexible solutions for commercial vehicles and engines

WITZENMANN

managing flexibility



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HYDRA

Quality by Witzenmann



DECOUPLING
ELEMENTS



COMPONENTS
INSTALLED
CLOSE TO THE
ENGINE



PIPING
SYSTEMS

WITZENMANN – THE NUMBER ONE IN EUROPE

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WHEREVER YOU NEED US. WORLDWIDE.



America
Brazil
USA

Asia
China
India
Korea

Europe
Austria
Belgium
Czech Republic
France
Germany
Italy
Poland
Russia
Sweden
Slovakia
Spain
United Kingdom

Maintaining close contact with our customers is, for us, a matter of fact and an integral part of what we do day in, day out. What could be more important than, being right where you are – present in the major marketplaces all around the world?

In the commercial vehicles and engine sector our expertise is married to decades of experience in vehicles technology and industrial applications. A synergetic effect that is evident in our product solutions.

Which you can access worldwide.

Both in the Witzenmann parent company and in 22 subsidiaries. We have more than 3.000 employees dedicated to engineering your individual solutions, unbeatable in quality and cost-effectiveness. And our group-wide comprehensive and cross-linked logistics association ensures all products arrive where they are needed.

This is an endeavour that is bound by tradition. As the European market leader and one of the world's leading companies.

ON LAND, ON WATER AND IN THE AIR. FOR MORE THAN 100 YEARS.



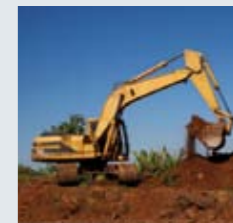
Development
partner

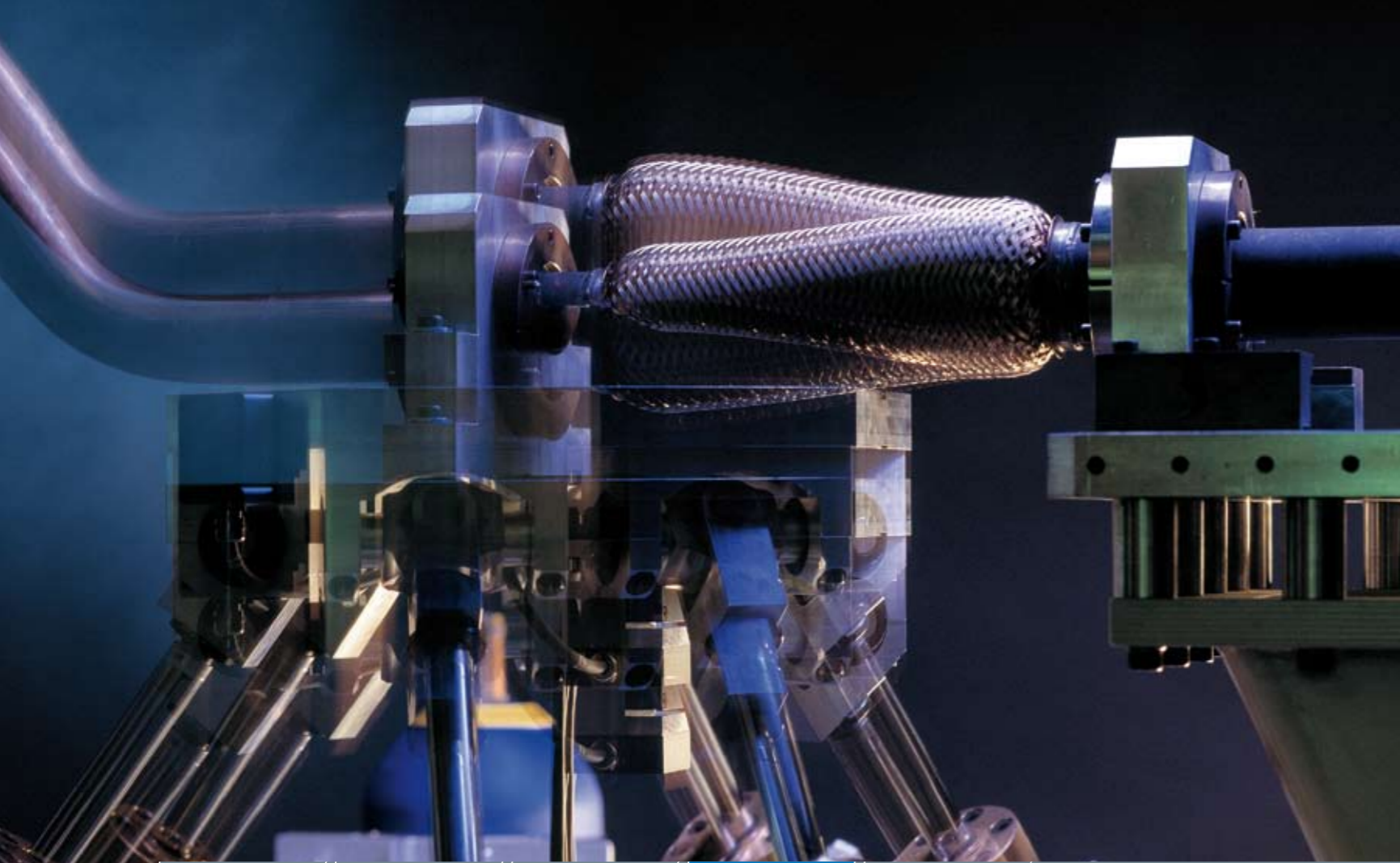
Witzenmann has always been the leader in the market. Whether as the inventor of the metal hose in 1885 or as the founder of a completely new branch of industry.

Mobility is a defining aspect of today's world. People, information and goods need to be transported quicker and more flexible from place to place. All over the world – by truck, bus, rail, ship, helicopter and plane. In large engines that power these vehicles, as well as in aircraft turbines and even rocket drives, flexible metal elements from Witzenmann play a vital part.

The variety of possible applications for our product solutions is nearly unlimited.

So we constantly pave new ground. Every day. With visions that develop into concrete aims. Applying the highest quality standards. And with a passion for detail, turning excellent products into truly outstanding solutions: highly flexible hoses and decoupling elements for use in exhaust systems, exhaust gas and oil return pipes, curved piping systems with flexible components and much, much more.





Engineering

At our headquarters in Pforzheim, we have a pool of engineers working on developing individualized product solutions for our customers.

ENGINEERING IS THE FOUNDATION – INDIVIDUAL SOLUTIONS THE RESULT.



The range of applications for commercial vehicles on water, on land or in the air is diverse and complex. Meeting these challenges requires more than just technical know-how. These solutions embrace visions and creativity, a flair for using new technologies, understanding, and an intuitive grasp of customers' needs.

And so our experts will be right alongside you, from the very first project discussions right up to the product development stage. Specialists who assist your project team - from prototype construction to detailed preproduction series, from pilot production to large-scale manufacturing.

With our capacity for development testing capabilities, 150 years of experience and a pool of engineers we can provide you with customized product solutions delivering optimal quality and cost-effectiveness. Underlying all this are standards which enable us to continually maintain our hold on the market as leaders in technology.

Despite above efforts, designed products will be tested in accordance with our customers specifications. Even with the most stringent batteries of tests: electrodynamic vibration test beds, test stations for determining durability and resistance to hot gases, and corrosion testing facilities. With these tests we not only ensure that each component is optimally configured, but also that it can withstand every conceivable stress and strain. Over a long period of time.

WE RELY ON THE BEST. AND THE BEST RELY ON US.



References

Aerospace:

Airbus Deutschland GmbH, EADS Astrium GmbH, EADS Space Transportation, Eaton-Aerospace Operations, Eurocopter Deutschland GmbH, Liebherr-Aerospace, Magna Steyr Space Technology, MTU Aero Engines, Snecma Moteurs

Engines:

Caterpillar, Detroit Diesel, Jenbacher, MAK, MAN B&W, MTU, MWM

Trucks:

DAF Trucks, Daimler, Evobus, IVECO, Neoplan, Nissan Diesel, RENAULT VI

Special vehicles:

AGCO, Bombardier, Case Steyr, John Deere, Liebherr, Linde Transportation, Volvo Construction Equipment



Variety. Reliability. Cost-effectiveness. Three features of our products that explain why our order books now read like a Who's Who of leading European commercial vehicle, ship and industrial engine manufacturers as well as the aerospace industry.

That's reason enough for us to continually press on and enhance the quality of our product solutions still further. Which we prove time and again at both national and international levels. Through certification and approval by the most important testing institutes and manufacturers, all around the world.

In order to ensure optimal quality, we run various series of measurements in our test lab which go far beyond the statutory requirements.

Our most crucial benchmark of quality is your verdict on our products. A high level of customer satisfaction is our greatest incentive to do all we can to optimize quality.

That we have been consistently living up to these standards for a long time is demonstrated by our DIN ISO 9001 certification in 1994 – the first company within the industry to do so – and the ISOTS 16949 certification in 2003.



Solutions

All metal hoses and expansion joints for commercial vehicles, special vehicles and industrial large engines are developed to customer specifications and manufactured on a large scale.

WITH US, INDIVIDUAL SOLUTIONS ARE THE NORM.



Exhaust decoupling elements

Use of short, selfsupporting elements allows an installation position very close to the engine. We offer highly flexible elements in a number of designs to fully isolate the system from movements and vibration. Both of these designs are naturally pressure resistant and gas tight.

A number of stripwound hose designs are available where reduced requirements in regards to leak rate are acceptable.

Exhaust expansion elements

To compensate for thermal expansion caused by high temperatures in the manifold area, in front of and behind the turbocharger, and in the frontpipe area.

Exhaust gas and oil return pipes

To reduce pollutant emissions from engines and to ensure oil supply to engines and turbo-chargers. These pipes compensate for thermal expansion, mis-alignment in assembly, vibrations and movements of the engine - at extreme temperatures.

Flexible piping systems

A combination of rigid and flexible components for use as a pressure-resistant system in gas and/or liquid cycles. They combine simple assembly with reliable compensation for mis-alignment in assembly and movement of the aggregate while conforming with the very highest safety standards.



Installation

Areas of application

Diesel, petrol, gas and large industrial engines

Types

- With exterior braiding
- With stripwound liner
- With interior braiding

Technical properties

- Provide isolation from large movements of the exhaust system and vibrations of the engine in angular, lateral and axial directions
- Universal application, particularly suitable for installation near the engine in the headpipe area
- Compact design
- Conforms to technical norms for gas-tightness due to metal bellows
- Element has specifically adapted damping properties
- Flow conduction (in designs with a stripwound liner or interior braiding)
- Temperature-resistant due to selection of suitable materials and multi-layer construction
- Corrosion-resistant due to selection of suitable materials
- Currently available in all standard fitting diameters
- Geometric and technical properties can be adapted to suit customer-specific installation requirements
- Suitable for use as exhaust expansion elements in certain special situations



Installation

Areas of application

Pick-up trucks/vans, fork-lift trucks, trucks, construction machinery

Types

- With exterior braiding
- With exterior wire mesh
- With oval cross-section
- With or without stripwound liner
- With or without interior braiding

Technical properties

- Provide isolation from large movements of the exhaust system and vibrations of the engine (angular, lateral and – if required – in axial directions)
- Universal application along the entire length of the exhaust system
- Conforms to technical norms for gas-tightness due to metal bellows
- Element has specifically adapted damping properties
- Flow conduction (in designs with a stripwound liner or interior braiding)
- Temperature-resistant due to selection of suitable materials and multi-layer construction
- Corrosion-resistant due to selection of suitable materials
- Geometrical and technical properties can be adapted to suit customer-specific installation requirements



Areas of application

Used in engines with exhaust gas turbochargers to provide isolation from high-frequency vibrations in the frontpipe area

Types

Metal bellows with exterior wire braiding and internal sleeve

Technical properties

- Provide isolation from high-frequency vibrations caused by the exhaust gas turbocharger
- Short, compact design
- Conforms to technical norms for gas-tightness due to metal bellows
- Self-supporting with very high static rigidity
- Flow conduction due to internal sleeve
- Temperature-resistant due to selection of suitable materials and multi-layer construction
- Corrosion-resistant due to selection of suitable materials
- Currently available in all standard nominal diameter and lengths
- Geometrical and technical properties can be adapted to suit customer-specific installation requirements
- Connecting pieces: V-End, flange or customized



Exhaust gas return pipes

Areas of application

Exhaust gas return pipes for use with spark-ignition and diesel engines

Oil return pipes

Areas of application

Oil return pipes for use with spark-ignition and diesel engines

Types

- Designed per customer specifications, preferably with corrugated section
- Bent: smooth pipe bend or bent in the corrugated section
- Connection using flanges, V-End connections or per customer specifications
- With or without insulation

Technical properties

- Compensation of vibrations, thermal expansion and mis-alignment in assembly
- Conforms to technical norms for gas-tightness/oil-tightness due to metal bellows
- Temperature-resistant due to selection of suitable materials
- Corrosion-resistant due to selection of suitable materials
- Lightweight



Installation

Areas of application

- Abgas: vor und nach Turbolader
- Ladeluft

Types

- With or without internal sleeve
- With or without insulation
- Design as per customer specifications, preferably with corrugated section
- Connection using flanges, V-End connections or as per customer specifications

Technical properties

- Conforms to technical norms for gas-tightness due to metal bellows
- Temperature-resistant due to selection of suitable materials
- Corrosion-resistant due to selection of suitable materials
- Currently available in all nominal diameters and lengths
- Geometrical/technical properties and fittings can be adapted to meet customer-specific requirements
- Pressure-resistant due to multi-layer construction



Installation

Areas of application

- In the engine, bellows with welded cast elements are used to compensate for thermal expansions, vibrations and to equalise installation tolerances.
- exhaust gas: in front of and behind the turbocharger, manifold
 - charge air

Types

- with and without internal sleeve
- with and without insulation
- design with cast manifold according to customer's specification
- connection with flange, V-end or according to customer's specification
- scope of supply including connecting elements possible

Technical properties

- compensation for thermal expansions and installation tolerances, decoupling of vibrations
- technically leak-free thanks to metal bellows
- heat and pressure-resistant thanks to selection of suitable materials and construction
- resistant to corrosive media or media constituents thanks to selection of suitable materials
- geometric and technical properties and connection technique can be adapted to suit customer-specific installation situation
- compact design
- components can be used even where installation space is at premium thanks to a suitable design
- almost all common casting materials can be used, even carbon steel is not an obstacle



Areas of application

Trucks, buses, construction machinery, fork-lift trucks

Types

Stripwound exhaust hose with interlocked profile



Technical properties

- Provides isolation from large movements of the exhaust system and vibrations of the engine in angular, lateral and axial directions
- Resistant to torsion
- Minimal leakage due to optimized interlocking profile
- Element has damping properties
- Currently available in all standard nominal diameter and lengths
- Geometrical and technical properties can be adapted to suit customer-specific installation requirements



① Areas of application

Trucks, pick-up trucks/vans, tractors, construction machinery

Types SW 380

Stripwound exhaust hose with corrugated profile



Technical properties

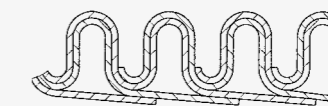
- Provides isolation from movements of the exhaust system and vibrations of the engine in angular, lateral and axial directions
- Resistant to torsion
- Conforms to technical norms for gas-tightness due to corrugated profile
- Currently available in all standard nominal diameters and lengths
- Geometrical and technical properties can be adapted to suit customer-specific installation requirements

② Areas of application

Trucks

Types SW 310

Stripwound exhaust hose with corrugated profile



Technical properties

- Provides isolation from movements of the exhaust system and vibrations of the engine in angular, lateral and axial directions
- Resistant to torsion
- Minimal leakage due to corrugated profile
- Profile with integrated flow conduction
- Element has damping properties
- Currently available in standard nominal diameters and lengths
- Geometrical and technical properties can be adapted to suit customer-specific installation requirements



Installation

Areas of application

Charge-air pipes, cooling-water pipes, oil pipes

Types

- Designed according to customer specifications
- Connecting pieces as per customer specifications
- Use of one or more flexible elements depending on requirements
- With or without insulation

Technical properties

- Compensation of vibrations, thermal expansion and mis-alignment in assembly
- Conforms to technical norms for oil-tightness due to all-metal construction and flexible metal element
- Temperature-resistant due to selection of suitable materials
- Corrosion-resistant due to selection of suitable materials
- Lightweight
- Pressure-resistant due to multi-layered nature of the flexible element



Installation

Areas of application

Cooling water pipes, oil pipes, air-conditioning pipes

Types

- Designed as per customer specifications
- Connecting pieces as per customer specifications
- Welded in accordance with specifications
- Use of one or more flexible elements depending on requirements
- With or without insulation

Technical properties

- Compensation of vibrations, thermal expansion and mis-alignment in assembly
- Conforms to technical norms for oil-tightness due to flexible metal element
- Temperature-resistant due to selection of suitable materials
- Corrosion-resistant due to selection of suitable materials
- Lightweight
- Pressure-resistance and mechanical protection due to exterior braiding