KOREMA®

KOMPENSATORENWERK
RHEIN-MAIN GERMANY

Kompensatoren EXPANSION JOINTS Compensatori

Compensateurs Compensadores Junta de Expansao

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KOREMA®
KOMPENSATORENWERK
RHEIN-MAIN GERMANY

"Without expansion joints, modern production facilities, with their piping and duct systems, would be inconceivable."

QUALITY MAKES THE DIFFERENCE

About us

KOREMA® links tradition with innovation

Production of belt type expansion joints

Products

KOREMA® is one of the leading manufacturers of flexible expansion joints. Expansion joints connect up pipelines. These transition elements compensate for movements and can also act as acoustic and thermal decouplers.

The various designs arise from the different movements which need to be absorbed: belt types, U types and a variety of special designs.

History

The company was founded at its present location in Weiterstadt near Darmstadt, Germany, in 1968. For its time, it was the first specialist company in the world to manufacture novel types of environmentally friendly expansion joints. Only a few years later, the company opened its first agencies abroad.

The company has always assigned high priority to innovative developments. KOREMA® was therefore the first company to manufacture expansion joints totally free from asbestos. Several German and world patents followed. The trend was clearly in one direction: the compound materials used must become even more eco-friendly. KOREMA® with its SIMIFLON® and ELTROFLON® expansion joints once again pointed the way forward. Today, the company stands for environmentally friendly products of outstanding quality and durability.

General information

When the demand is for quality

A sandwich made to measure

Expansion joints have a sandwich design. Elastomers and foils are calendered onto high strength substrates and the attachment areas are then vulcanised by means of special adhesives. Depending on the design, the joints have excellent temperature stability and outstanding chemical resistance. Flow liners prevent abrasive media in turbulent flow from damaging the fabric.

Tight and stable

Elastomers such as Silikon®, Hypalon® and Viton® provide resistance to media attack and improve joint sealing. Externally they act as protection against physical damage and atmospheric influences such as ozone and sunlight.

If expansion joints need to meet extreme tightness requirements, we fit additional PTFE foils (e. g. Teflon®).

Always right for the job

KOREMA® expansion joints connect a wide variety of different pipes. They vary depending on the consistency of the medium flowing through them. The media may be gaseous, humid, wet or in the form of a condensate.

Media also differ in their concentrations. They may contain dust, acid, solvents, solids or condensate or they may be potentially explosive – KOREMA® expansion joints are specially manufactured to suit each application.

AC1 cross section
Belt type expansion joints with pre-insulation.
Media:
raw gases, flue gases

A3 U type
U type expansion joints with integrated flanges

Special design
FDA expansion joints
Special design

Special design
Square to round

KOREMA® manufactures expansion joints in all dimensions

KOREMA®

General information

about KOREMA® expansion joints

KOREMA® expansion joint on stack of waste fuelled power station

Connecting pipes

KOREMA® expansion joints connect piping systems which convey gaseous or dust laden flue gases at pressures above or below atmospheric pressure. The function of flexible joints is to absorb pipe movements in all directions:
- Axial expansion and contraction (linear movement)
- Lateral offset (side movement)
- Torsion (twisting)

The point of application determines the design

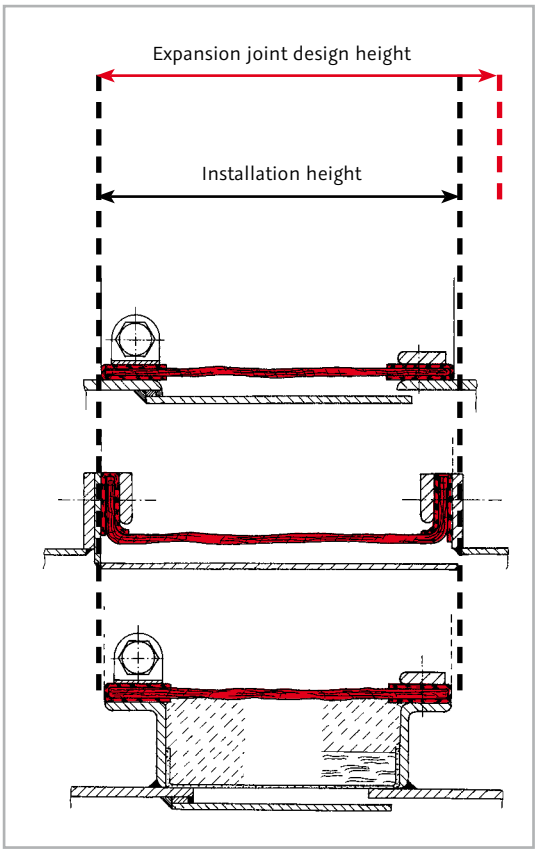
The precise design of the expansion joint is determined by its point of application. The basic shapes are round, square and oval. Expansions joints with differing cross sections are also used. Besides basic designs, we also manufacture special shapes and types which are customised to comply exactly with special customer requirements.

Top quality

KOREMA® expansion joints are always first choice since they have excellent properties:
- Thermal insulation
- Vibration damping
- Acoustic damping

General information

Selection guide



Required parameters

To customise expansion joints to your requirements, we require exact parameters about the media flowing through the expansion joints.
The following criteria are relevant:

- Medium consistency and properties:
  whether it contains dust, acid, solvent etc.
- Temperatures:
  internal, external, average and peak values
- Operating pressure:
  above or below atmospheric pressure, pressure peaks, burst pressure, incident design pressure
- Flow velocities
- Use of guide pipes/flow liners
- Installation conditions:
  installation heights, distance between flanges
- Movement absorption directions:
  axial, lateral, torsional
- Special requirements:
  silicone-free, food-safe, flushable, washable, electrically conductive

Quality features of flue gas expansion joints

Design	variable
Thermal properties	Range from approx. -90 °C to +1000 °C, -130 °F to +1832 °F
Chemical properties	Resistant to acid and alkalis
Fire behaviour	Fire resistant to DIN 53483/2
Weather resistance	excellent
Mechanical strength	Puncture resistant to DIN EN 863 Resistant to repeated flexure to DIN 53359
Sealing and Pressure resistance	Complies with Directive 97/23 EC PAS 1010/6 Burst pressure to DIN 53861 Production complies with the guidelines for the order and manufacture of pressure equipment PAS 1010/6 dated 10/2001

KOREMA®-Profil	Movement absorption as % of installation height/flexible part		
	10–15%	20–35%	up to 50%
A	■	■	
AC*, B, BC*	■	■	■
E, EC*		■	■

C* = Removed flange formations to enlarge expansion joint chamber

Table Movement absorption

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KOREMA® belt type

Expansion joint for large dimensions

Modern production plants are inconceivable without expansion joints

Various basic designs

KOREMA® belt types come in all sizes, even for extremely large duct dimensions. Pre-insulation is also possible in the form of dust protection liners or protection against excess temperatures.

Open, prepared joint

KOREMA® belt type expansion joints can also be delivered with «open ended joint». The special KOREMA® adhesive for closing joints is also supplied.

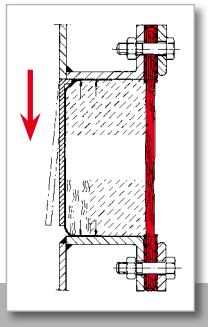
Preassembled units ready to fit are available complete with the associated steel parts. Fitting is made easier by pre-punching the flange holes.

On request, open ended belt designs can be closed on the building site by the KOREMA® Installation Service.

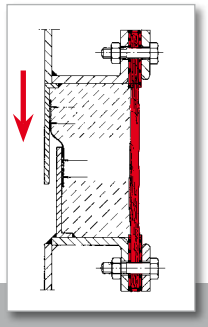
KOREMA® belt type

Expansion joints: flexible, sturdy and approved

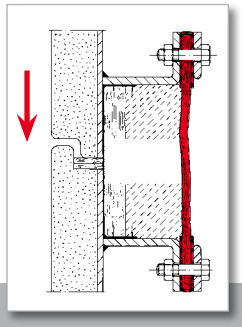
AC1 expansion joint,
expansion joint steel unit completely preassembled and ready to fit



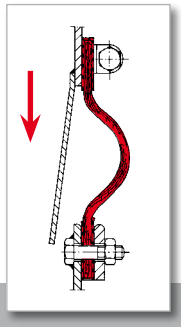
Drawing 1
AC1 with insulation bolster



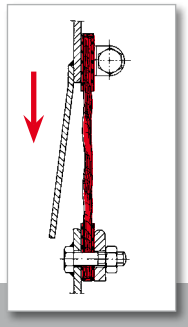
Drawing 2
AC1 with two-part flow liner



Drawing 3
AC1 after z-joint lining



Drawings 4, 5
A1 with hoop attachment, bolted as alternative



5

KOREMA®

KOREMA® U type

Standard at a high level

KOREMA® expansion joint fitted between induced draught fan and stack

The most common type

KOREMA® U type expansion joints are the most frequently installed version. They are also referred to as «flange type» since they are flanged between the ends of two pipes or ducts.

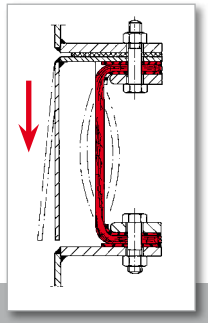
Flange design is dependent on the existing plant, customer specifications or the existing steel construction on site.

This type also comes with pre-insulation and protection against dust-laden media. Additional elastomeric gaskets ensure drip tightness if the system operates at or below dew point.

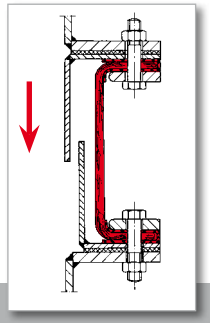
KOREMA® U type

Standard at a high level

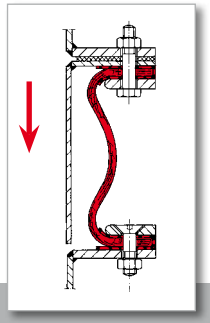
A3 expansion joint
ready to fit and preassembled with flow liner



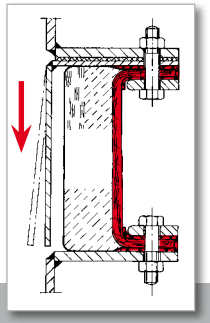
Drawing 1
A3 Type



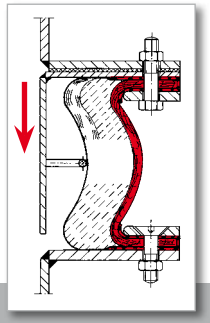
Drawing 2
A3 type with two-part flow liner



Drawing 3
B3 type with wave shape fitted with countersink bolt at one end



Drawing 4
AC3 with insulation bolster



Drawing 5
BC3 with insulation bolster and support ring

KOREMA®

KOREMA® special designs

Nothing is impossible

KOREMA® expansion joints in application

High quality

Standard and special design units are made to the same exacting requirements and are subject to the same strict quality control.

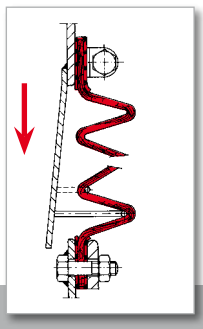
One stop sourcing

Your advantage: at KOREMA® you find everything from a single source. We can produce any special expansion joint design in our in-house model-making shop.

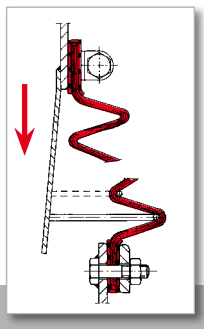
Another advantage: as we are a one-stop producer, we can supply both standard and custom solutions very quickly.

Made to measure

We manufacture your expansion joints individually to your specifications:
- Bellows with or without support rings
- Versions in disc shape
- Versions with differing cross sections
- Versions from round to square or oval
- Versions based on CAD drawings
- Non standardised high temperature gaskets



Drawing 1
E1 type with support ring, hoop and bolted



Drawing 2
E15 type

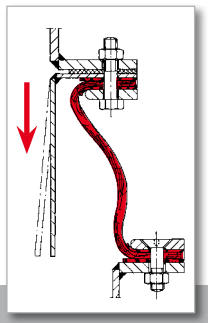
KOREMA® special designs

Customised, short turnaround

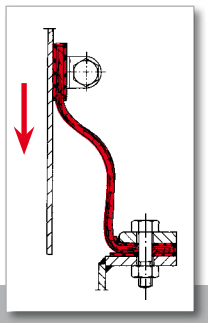
A3 expansion joint
with inclined offset flange, food-safe variant with flow sight glass

Special shape templates
to produce a variety of different expansion joints

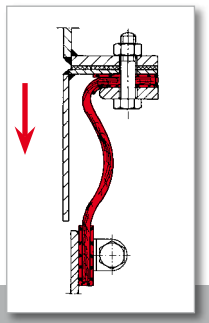
A35 with varying cross section
with SIMIFLON®



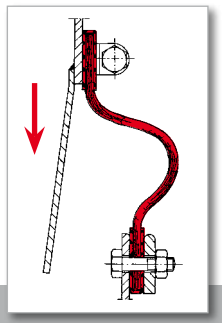
Drawing 3
A35 type



Drawing 4
A25 type



Drawing 5
A25 type



Drawing 6
B15 type

KOREMA®

FDA expansion joints

SIMIFLON® – for the food and pharmaceutical industries

KOREMA® expansion joints in application

Patented material: SIMIFLON®

SIMIFLON®

Special requirements

Materials which are used in food and pharmaceutical production are subject to particularly stringent regulations. On the one hand, they should be completely safe from a physiological aspect. On the other hand, internal components which come into contact with the product must be easily and totally cleanable – when the batch is changed or at every cleaning operation.

SIMIFLON® – the solution

To meet these requirements, KOREMA® developed the special material SIMIFLON®. It is based on the permanent connection of high-strength carriers. By bonding PTFE to each carrier fabric, we can create fabric transitions with no dead space, as required in the food and pharmaceutical industries.

Universal applications

SIMIFLON® expansion joints are extremely flexible to absorb movements. They are suitable for universal applications through the use of different strength carriers. As a result they represent excellent solutions for use in the food and pharmaceutical industries.

We confirm FDA approval for each application coating and position by supplying a certificate.


ZERTIFIKAT

KOREMA®

FDA

FDA expansion joints

SIMIFLON® – the material with excellent values

Quality features of SIMIFLON® (patented)

Design	white
Thermal properties in heat	- long-term temperature 260 °C, 500 °F - short-term (incident, up to 15 min) max. 300 °C, 572 °F - melting point 327 °C, 620 °F
Thermal properties in cold	up to -90 °C, -130 °F
Resistance to weather	excellent
Sealing characteristics and compatibility	physiologically harmless according to EU Directives and FDA-US CFR washable, flushable, resistant to solvents

Applications: Food processing industry, pharmaceutical industry, scrubbers
Highlights: smooth, wrinkle free surfaces

KOREMA®

ATEX expansion joints

Our patented high-end material

KOREMA® expansion joint fitted in a cement factory

Patented material: ELTROFLON®

When safety is top priority

For equipment installed in explosive atmospheres (ATEX), KOREMA® offers expansion joints made of the compound material ELTROFLON® which is protected by world-wide patents. It combines the excellent properties of SIMIFLON® with electrical conductivity. Just as with SIMIFLON®, expansion joints can be designed in all geometric shapes but with the added feature of conductivity.

Ideal for many applications

Typical applications of ELTROFLON® expansion joints (zones 0, 1, 2) include Ex protection as required in rock grinding mills, cement mills, stone and lignite mills, mills for nanoparticles, media containing solvents and fitting locations exposed to pressure surges.

Withstands the pressure

A feature of the material is its excellent pressure resistance.

KOREMA® expansion joints made of ELTROFLON® meet the regulations for surge pressure resistance according to the Pressure Equipment Directive 97/23 EC, burst pressure > 0.5 bar - PAS 1010/6.

ATEX expansion joints

ELTROFLON® – high-end material

Quality features of ELTROFLON® (patented)

Design	- black - with conductive PTFE inner - meets Directive 94/23 EG-ATEX
Thermal properties in heat	- long-term temperature 260 °C, 500 °F - short-term (incident, up to 15 min) max. 300 °C, 572 °F - melting point 327 °C, 620 °F
Thermal properties in cold	up to -90 °C, -130 °F
Explosion protection	meets ATEX guidelines 05/2000 of Directive 94/9 EG 03/1994
Chemical properties	ELTROFLON® is resistant against almost all chemicals
Fire behaviour	Fire resistant to DIN
Weather resistance	excellent
Mechanical strength	Puncture resistant and resistant to repeated flexure to DIN
Sealing characteristics and pressure resistance	Production is based on the guideline for the order and manufacture of pressure devices PAS and complies with the directives according to EC and DIN, burst pressure to DIN
Compatibility	physiologically harmless according to EU Directives and FDA-US CFR washable, flushable, resistant to solvents

Applications: Food processing industry, pharmaceutical industry, flue gas systems, scrubbers
Highlights: smooth, wrinkle free surfaces

KOREMA®

Steel parts and accessories

One stop sourcing

Additional parts are manufactured in our in-house steel shops

So that everything fits

You obtain everything you need in one stop from KOREMA®. We even have an extensive range of steel accessories in almost any steel grade.

The scope of supply includes connecting parts, baffles, flow liners and mating flanges.

In-house production

We guarantee a perfect fit by producing in our own factory. Steel parts simply fit perfectly to our expansion joints.

Optimum sealing characteristics

KOREMA® gaskets are specially designed for the appropriate expansion joints. For applications under 250 °C, 482 °F, for example, the gaskets are made of T700 insulation fabric.

They are full surface bonded, multilayered and have the same dimensions as the expansion joint flange. They are fitted between the baffle/flow liner and the customer‘s fixed flange to ensure optimum sealing.

Steel parts and accessories

Always the right one for the job

Gaskets

Elastomer gaskets made of Hypalon®, Silikon® or Viton®
High-temperature gaskets
Frame gaskets
Condensate drains

Insulation

Mineral wool
HT Insulating felt
Project-related, insulation bolsters ready to fit

Service kit

Repair kit with fabric material,
special adhesive and
practical tool for closing and repair work

Adhesives

K 303 adhesive/vulcaniser, white or black
K 404 Tempercol® high-temperature adhesive
Hypalon® adhesive
Certified silicone-free adhesives

Primers and top coats

RAL to customer requirements
High-temperature coats
Galvanised versions

Steel parts

Screw unions
Support rings and frames
Flow liners
Flanges, clamping flanges

KOREMA®

Quality

Made in Germany

Quality assurance in production and fitting

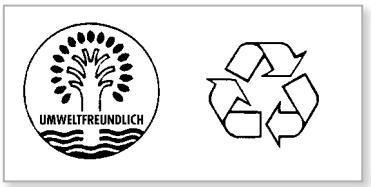
Unsurpassed quality

KOREMA® expansion joints are exclusively manufactured in our own factory at our home location. Over 100 different fabrics and foils in a variety of combinations are laminated to produce flexible expansion joints which are sandwiched and multilayered. For safety reasons, technical progress demands extreme care in the selection, combination and processing of these materials.

Every expansion joint is identified by its own nameplate. This guarantees the immediate allocation of shipping items and shortens response times for maintenance and service work.

KOREMA® offers a binding and reliable delivery service.

Only ecological products are used for shipping, such as reusable wooden pallets and cardboard packaging.



Pictograms indicating environmental compatibility and reusability

Certified

Quality from Germany

Stringent tests

KOREMA® expansion joints meet very stringent test standards:
- Burst pressure to DIN 53 861
- Puncture resistance to DIN EN 863
- Fire resistance to DIN 53 438/2
- Long-term bending resistance to DIN 53 359
- Electrical conductivity
- Contact resistance to DIN EN 1081

Certificates

On request KOREMA® will supply you with all the customary certificates:
- Factory test certificates
- Acceptance test certificates to DIN / ISO / EN 1024- 2.1 /3.1B
- Safety data sheets
- Product data sheets
- Type tests
- German Lloyd AG
- German Institute for Construction Engineering

Certificates of Conformity

- For Pressure Equipment Directive 97/23 EC
- ATEX
- For EU Directive 2002 /72 and FDA /US
- Project-related tests (subject to charge)

KOREMA® is certified to DIN ISO 9001.

Quality assurance
Pressure measurement

U type with nameplate
The nameplate permits immediate identifi-cation.

Our Service and Training Centre is located at our head offices in Weiterstadt

KOREMA®

Handling
and installation

Specially shaped packaging for protection

Packaging to protect the shape

When KOREMA® expansion joints are fitted at their point of installation, they fulfil their function reliably. They are system-related products and may react sensitively to improper handling during shipping and fitting. For this reason they are delivered in specially shaped packaging which provides reliable protection against damage.

Expansion joints with preassembled mating flanges and baffles are shipped with spacers to avoid any damage in transit.

Installation right at the end

KOREMA® expansion joints should be fitted to the piping right at the end of installation work. For safety reasons, expansion joints damaged on the building site should not be fitted. Rework should only be undertaken after consultation with KOREMA®.

Each expansion joint comes with storage guidelines and fitting instructions. These documents are available in several languages and can also be downloaded from our website.

Materials

High-quality product made of high-quality components

Overview of materials	Temperaturresistance °C	Temperaturresistance °F	Properties
Strength carrier			
Polyester fabric/woven PR/PRD	150/180	302/356	High tear resistance
Aramid e.g. Kevlar®)	300	572	Extreme tear strength at low weight
Mineral fibre fabrics TSC® and TETE® + S® with stainless steel reinforcement	500 to 600	932 to 1112	Very good chemical resistance
Mineral fibre fabric C-600/ -603/ -610	500 bis 600	932 to 1112	Very good chemical resistance, insulation properties, fire resistance
Insulation fabric T 700	600	1112	Excellent fire resistance
Insulation fabric TS 700 with stainless steel reinforcement	600	1112	Excellent fire resistance
Stainless steel wire mesh (coarse/fine) and Monel wire mesh	600 to 1200 1000	1112 to 2192 1832	High-temperature resistance and high chemical resistance
Insulation			
Mineral wool/40 mm/wire netting	640/700	1184/1292	Non inflammable A1/DIN 4102, very good insulator, good dust protection
HT glass fibre mats 25 mm	1100/1200	2012/2192	High-temperature resistance, very high insulation value
HT needle mats 5–10 mm	1000	1832	Non inflammable to DIN
Glass mats 8–10 mm	500/600	932 to 1112	Non inflammable to DIN
Elastomer-coated strength carriers			
Silikon® rubber (VMQ) Silikon® black, white, transparent	-20 to 250	-4 to 482	Excellent temperature stabililty, very good ozone and weather resistance
Fluorsilicone rubber (FVMQ) – Viton®	-40 to 204	-40 to 400	Very good acid resistance
Polytetrafluoroethylene (PTFE) Teflon® white/black	-190 to 250	-310 to 482	Excellent chemical resistance against almost all known media, condensate resistance
Patented PTFE compound materials			
SIMIFLON®	250	482	Excellent chemical resistance against almost all known media, Condensate resistance Physiologically harmless according to EU Directives, FDA-US CFR washable, flushable
ELTROFLON®	250	482	
Foils			
Hypalon®	120	248	Excellent chemical resistance, electrical conductivity
Silikon®	250	482	Oxidation resistance, food-safe
Teflon®	250	482	Food-safe, electrical conductivity
Special rubber foil	170	338	Good pressure resistance
Lead foil	300	572	Radiation resistance
Kapton® foil	320	608	Temperature foil
Aluminium foil	600	1112	Heat resistance
Incoloy foil	1000	1832	Good chemical/thermal resistance
Stainless steel foil	1200	2192	High-temperature resistance

KOREMA®

Applications

KOREMA® expansion joints in application

Air-conditioning systems, air heaters and air preheaters, ATEX facilities for zones 0, 1, 2

Biomass cogeneration plants, blowers, brick and tile industry, burst pressure systems

Cement factories, centrifuge decoupling mechanisms, chemical plants, chemical plant engineering, chimney construction, cleaning and drying plants, cogeneration plants, conveyor systems, crushing plants

Dedusting facilities, diesel generators, drying plants, dust precipitators

Economisers, engine testing facilities, exhausters

Fan construction, filter systems, flue-gas desulphurisation plants, food processing industries (acc. to FDA)

Gas and air heaters, gas generation plants, gas turbines, general metallurgy

Heat exchangers

Iron and steelmaking plants

Large engine construction, lignite grinding mills (ATEX/pressure surge protection systems), low-temperature carbonising plants

Mills (acc. to ATEX)

Natural gas treatment

Paint mist extraction systems, paint shops (silicone-free), paper making machines, Pharmaceutical plants (acc. to FDA, acc. to ATEX), pipeline construction, power engineering, power stations (thermal), precipitators, pulp industry, pyrolysis plants

Reactor construction, recuperators, refineries, refractory engineering, residue incinerators

Sewage engineering, sewage sludge incinerators, shipbuilding, shipyards, sinter and pelleting plants, sludge incinerators, steam generation plants, steel works, strawfired power plants, substitute fuel power plants, suction systems

Test beds, thermal afterburners, thermal engineering, thermal waste gas treatment systems, treatment plants, tunnel ventilation fans

Ventilation systems of all types, vibration engineering

Waste gas and extraction systems, waste incinerators

Kompensatorenwerk Rhein-Main
07/2013 E1

Concept and design
www.rau-design.de

Photos
Cornelia Renson, Wiesbaden
KOREMA®

Printers
Künzel, Darmstadt

KOREMA®

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Expansion joints made of highly flexible materials