GKN SINTER METALS

# THINK > Filter Technology




## SIKA-R... AX

ENGINEERING > THAT MOVES THE WORLD

*Since 1759*

## 250 years of exceptional engineering

GKN Sinter Metals Filters, the leading manufacturer of porous sinter metal products, offers a variety of solutions to fulfil customer requirements.
We are familiar with various applications in almost every industrial branch.
Our products are applied in gas- and liquid filtration, dampening, sparging, sensor protection, bulk handling and many more. We offer solutions for high temperature and corrosive environments.

Sintered filter elements made of stainless steels, bronze, nickel based alloys, titanium and several special alloys can be manufactured seamless up to 1,600 mm length and 320 mm OD. Larger elements will be assembled in our certified in-house welding shop.
Our most innovative product for the chemical industry is the patented metallic membrane SIKA-R...*AS*.

The filter cartridges equipped with this state-of-the-art technology offer a flow rate up to 4 times higher compared to conventional sinter metal filter cartridges. Furthermore an excellent back flush performance is guaranteed. The filter active membrane layer with filter grades down to 0.1 µm absolute has a thickness of only 200 µm and is made of the same alloy as the coarse support material. The membrane is sinter bonded to the support and therefore cannot peel off.

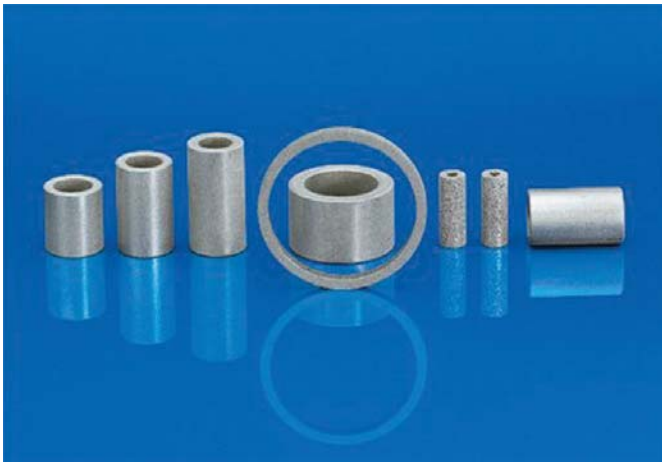
Another innovation introduced by GKN is the sinter bonded joint of porous parts with solid fittings in order to avoid welding seams – the weak spot of all sintered cartridges of our competitors.

All sintered materials of GKN offer a self-supporting structure with high mechanical strength.

We manufacture various filter grades with specified pore sizes and flow rates in order to have the appropriate solution for your requirements.

**SIKA-R...*AX* is the brand name of GKN Sinter Metals' high porous stainless filter elements manufactured by coaxial compaction**

SIKA-R...*AX* materials are used as self-supporting structural elements. The pores are mechanically fixed regarding size and position after the sintering process.



## Properties

These characteristics of SIKA-R...*AX* products go along with the following important properties:

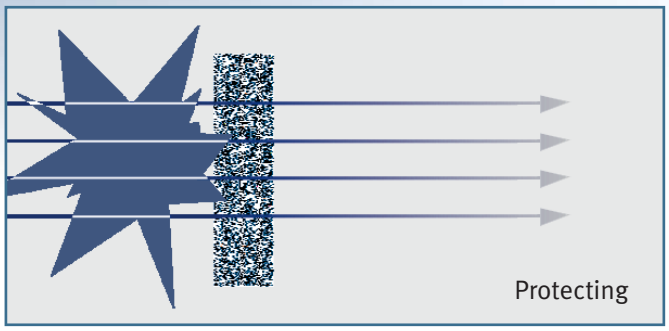
- Shape/-stability i.e. selfsupporting structural elements suitable for high differential pressures
- Particularly good properties when under compression, vibration and changing conditions or with high sudden pressures peaks
- High heat resistance and thermal stability
- Defined permeability and filtration properties because the pore size and distribution are exact and uniform
- Backflushing and easy cleaning with supersaturated superheated steam, chemical solvents, thermal and ultrasonic processes
- The variety of materials used can be welded and machined

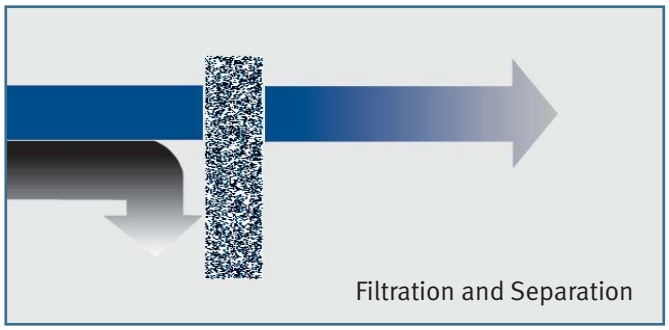
## Application Examples

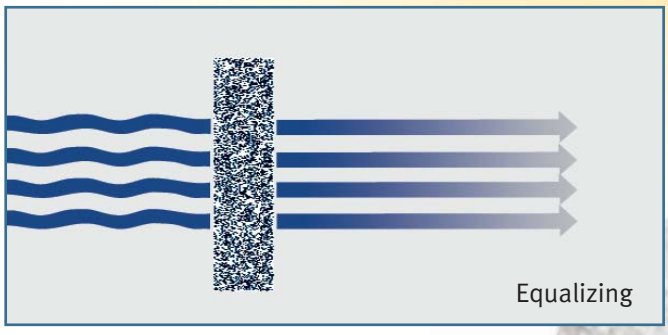
- Autogenous welding (as flame arrestors) / Explosion protection
- Polymer filtration
- Gas- and Liquid filtration
- Silencing
- Sparging
- Fluidization (handling of bulk material)
- Sensor and valve protection
- Flow restriction

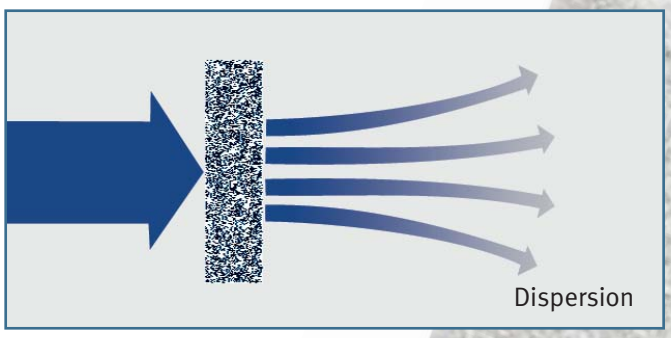
As well as various applications in industries like

- Chemical
- Food / Beverage
- Semiconductor
- Scientific Instrumentation
- Pharmaceutical




## Various forms of sensor protection

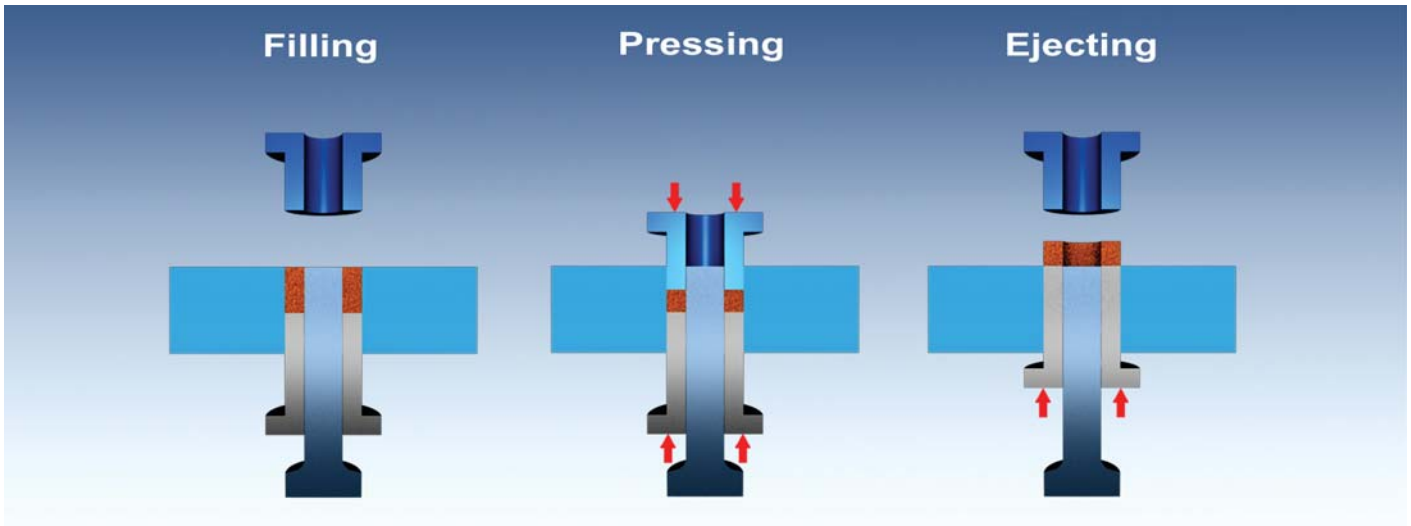
## Manufacturing of SIKA-R...*AX* Products

### Pressing process

SIKA-R...*AX* filter elements are formed by co-axial pressing.

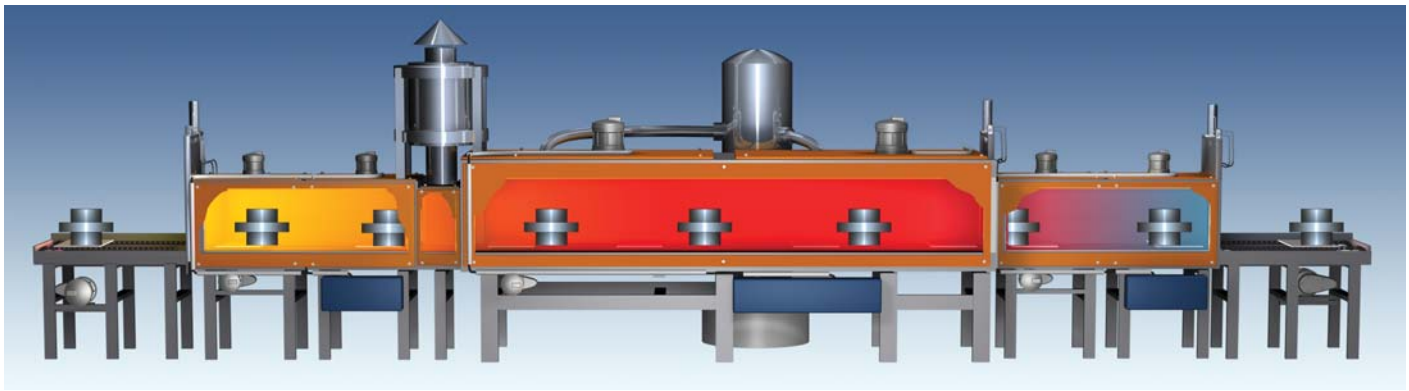
The metal powder is filled into the appropriate die and compacted in axial direction by upper and lower punch. The pore size of the finished product can be controlled by the choice of powder size and the pressing force used to form the part.

A wide range of finished shapes can be achieved by this pressing process.

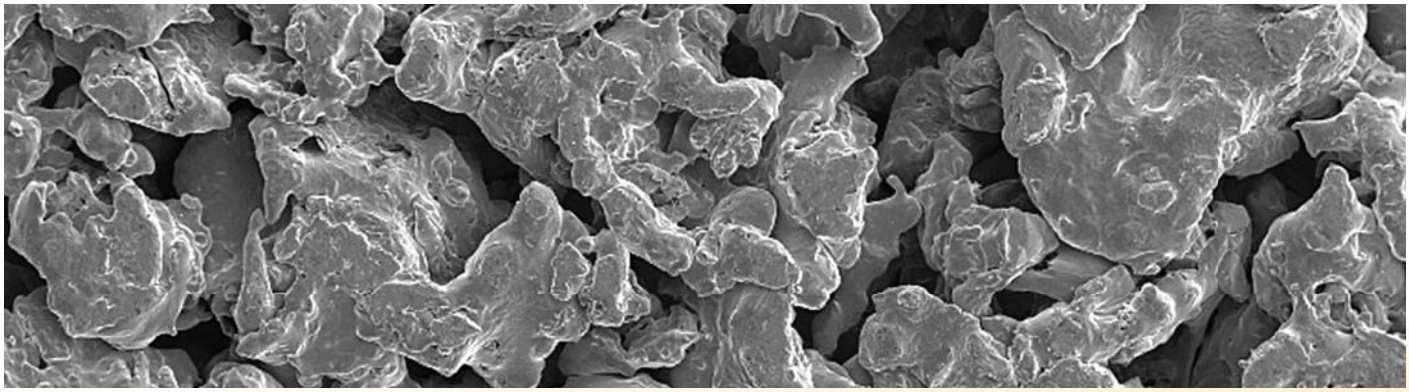


## Sintering

The compacted part is sintered in specially designed furnaces. Sintering is the fundamental processing step for all Powdered Metal (P/M) products. It is the process of bonding the powder particles by fusing them together at temperatures well below their melting point.
After sintering, regardless of micron size, the separate grain structure of the original powdered metal becomes fully interlinked to form a rigid part.
Sintering gives the high porous material the shape stability and property of a strong metal component.



Burn-out of lubricant | Sintering | Cooling



## Standard Materials

| Material | Name | Mat.-No. | SIKA- R... IS | AX | AS | FIL | B | Fe | Cr | Ni | C | Mo | Miscellany | Max. Temperature °C Reducing | Oxidizing | Keyword |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | in weight- % | | | | | | | | | | | | | |
| High alloyed material | AISI 304 L | 1.4306 | x | x | x | | | Bal. | 18.0-20.0 | 8.0-12.0 | <=0.03 | 0.5 | N<=0.1 | 600 | 500 | Standard for food application |
| | AISI 316 L | 1.4404 | x | x | x | | | Bal. | 16.0-18.0 | 10.0-14.0 | <=0.03 | 2.0-3.0 | N<=0.1 | 540 | 400 | |
| | | | | | | x | | | | | | | | 380 | 320 | |
| | AISI 904 L | 1.4539 | x | x | x | | | Bal. | 19.0-21.0 | 24.0-26.0 | <=0.02 | 4.0-5.0 | N<=0.15 Cu 1.2-2.0 | 600 | 500 | Resistant against sulphuric acid, phosphoric and hydro-chloric acid |
| | AISI 310 | 1.4841 | | | | x | | Bal. | 24.0-26.0 | 19.0-22.0 | <=0.25 | - | - | 800 | 600 | Heat resistant |
| | FeCrAl | 1.4767 Mod. | | | | x | | Bal. | 19.0-22.0 | - | <0.10 | - | Al 5.0-6.5 with rare earth elements | unfit | 1000 | |
| Nickel based alloys* | Hastelloy C 22 | 2.4602 | x | | | | | 2.0-6.0 | 20.0-22.5 | Bal. | <0.02 | 12.0-14.5 | W 2.0-3.5 Co 2.5 | 650 | 650 | Corrosion resistant with various agressive media. Duration application at > 400 °C possible. |
| | Hastelloy C 276 | 2.4819 | x | x | | | | 4.0-7.0 | 14.0-16.0 | Bal. | <0.02 | 15.0-17.0 | W 3.0-4.5 | 650 | 650 | |
| | Hastelloy X | 2.4665 | x | x | | | | 17.0-20.0 | 20.5-23.0 | Bal. | <0.15 | 8.0-10.0 | Co 0.5-2.5 W 0.2-1.0 | 930 | 800 | |
| | Inconel 600 | 2.4816 | x | x | x | | | 6.0-10.0 | 14.0-17.0 | >=72.0 | <0.15 | - | - | 700 | 600 | |
| | Inconel 625 | 2.4856 | x | | x | | | <=5.00 | 20.0-23.0 | >=58.0 | <0.10 | 8.0-10.0 | Nb 3.15-4.15 | 650 | 650 | |
| | Monel 400 | 2.4360 | x | x | x | | | <2.0 | - | >=63.0 | <0.30 | - | Cu 28.0-34.0 | 500 | 500 | Resistant against Cl-containing media |
| Bronze** | CuSn 11 | 2.1052 | | | | | x | - | - | - | - | - | - | 300 | 250 | Typically used for hydraulic & pneumatic |
| Titanium | Ti | - | x | x | | | | - | - | - | - | - | Ti > 99 % | 500 | 500 | Medicine. acid. electrolysis |
| Other | Other materials on request | | | | | | | | | | | | | | | |

Not all raw materials are in stock. Typical Iron or Nickel elements e.g. Si, Mn, P, S according to the literature.
* Nickel based *AX*-products only after consultation. Not all dimensions feasible.
** Nickel plating possible

## Elements SIKA-R...*AX*

Our various high porosity sintered metal filter elements can be manufactured in the following standard geometries:

- Discs
- Cylinders / Open ended
- Cylinders with one closed end
- Plates
- Cones
- Silencer made of stainless steel sintered together with a solid stainless steel thread

Seamless design up to 315 mm diameter.

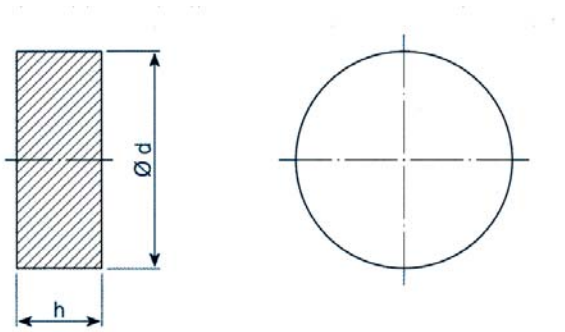
**We also manufacture to customer-specified dimensions.**
**Bigger elements can be welded at our certified in-house welding shop.**

## GKN Filter Grades

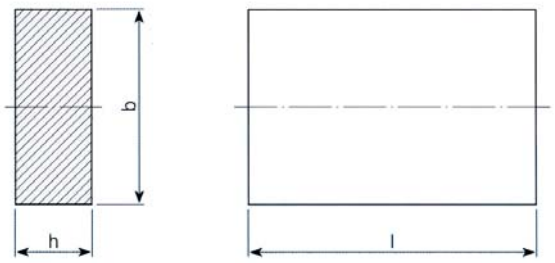
| | | |
|---|---|---|
| SIKA-R | 0.1 | *AX* |
| SIKA-R | 0.5 | *AX* |
| SIKA-R | 1 | *AX* |
| SIKA-R | 3 | *AX* |
| SIKA-R | 5 | *AX* |
| SIKA-R | 7 | *AX* |
| SIKA-R | 10 | *AX* |
| SIKA-R | 15 | *AX* |
| SIKA-R | 20 | *AX* |
| SIKA-R | 30 | *AX* |
| SIKA-R | 40 | *AX* |
| SIKA-R | 50 | *AX* |
| SIKA-R | 80 | *AX* |
| SIKA-R | 100 | *AX* |
| SIKA-R | 150 | *AX* |
| SIKA-R | 200 | *AX* |

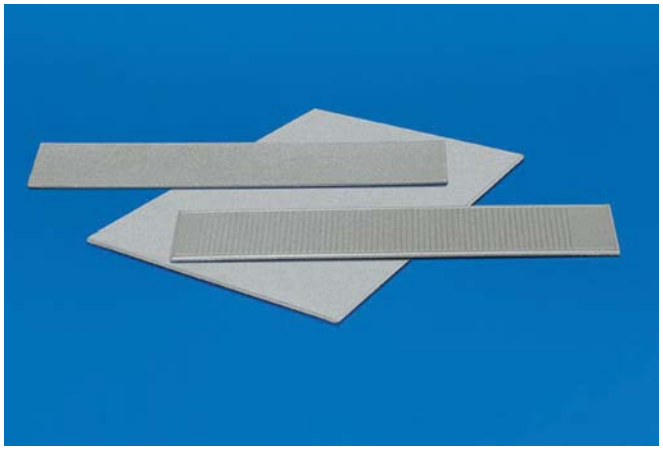
## Standard Geometries

### SIKA-Discs




Seamless construction is possible up to 315 mm diameter and 40 mm in height

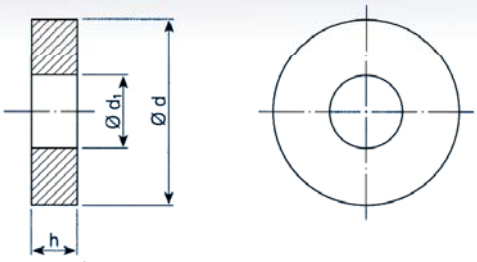


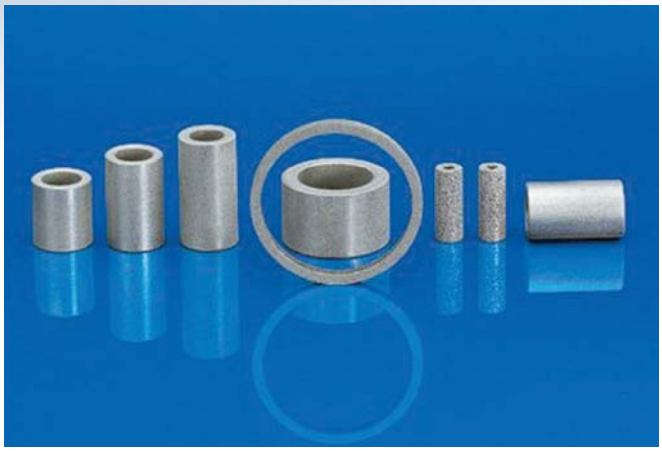



Standard plate size is 200 x 300 mm, height up to 20 mm

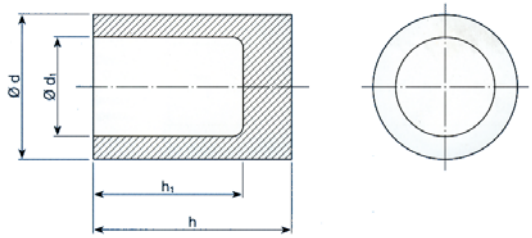
## Standard Geometries

### SIKA-Cylinders / Open ended

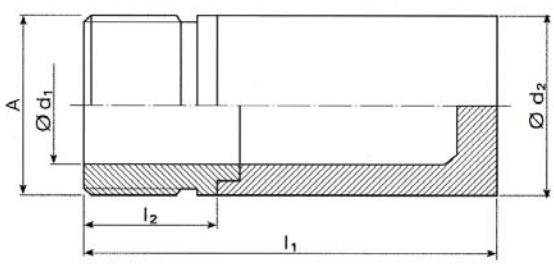


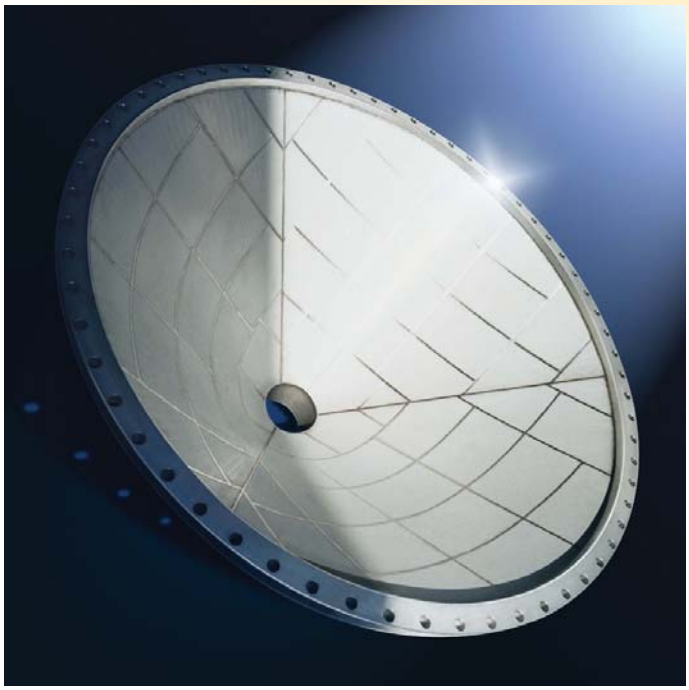
### SIKA-Cylinders with one closed end

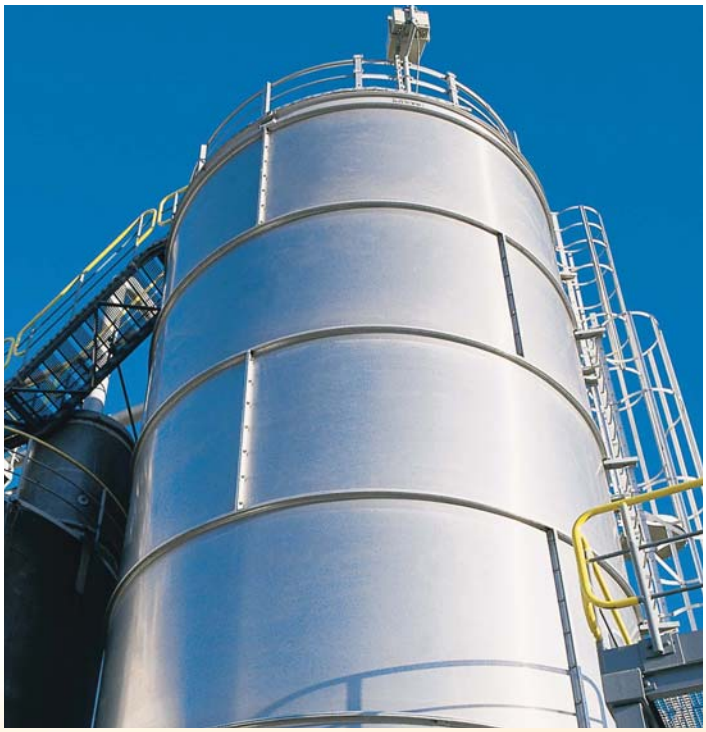



### Silencer made of stainless steel sintered together with a solid stainless steel thread




## Customer Specific Constructions



## Additional Applications of GKN Filters...

**Catalyst recovery**

**Refinery**

**Water treatment**

Pneumatic valves

Ex-protection

Food shaping

# Basic Information for Designing a Filter

## Customer's Information

Enquiry date: _____

Company Name _____
Contact Name _____
Street Address _____
ZIP _____
Town, US State _____
Country _____

**1. The planned application of the SIKA element?**

◯ Filtration ◯ Equalizing ◯ Fluidizing
◯ Separation ◯ Silencing ◯ Sparging
◯ Throttling ◯ Protecting ◯ Degassing

Others _____

**2. What kind of gas or liquid will flow through the SIKA element?**

**Medium specification** _____
Operation density _____
Dynamic viscosity _____
Operation temperature _____
Operating flow rate _____
Absolute operating pressure before SIKA-element _____
Wanted or permissible pressure drop of clean filter _____
Max permissible pressure drop of used filter _____

**3. Which particles must be retained by a SIKA element?**

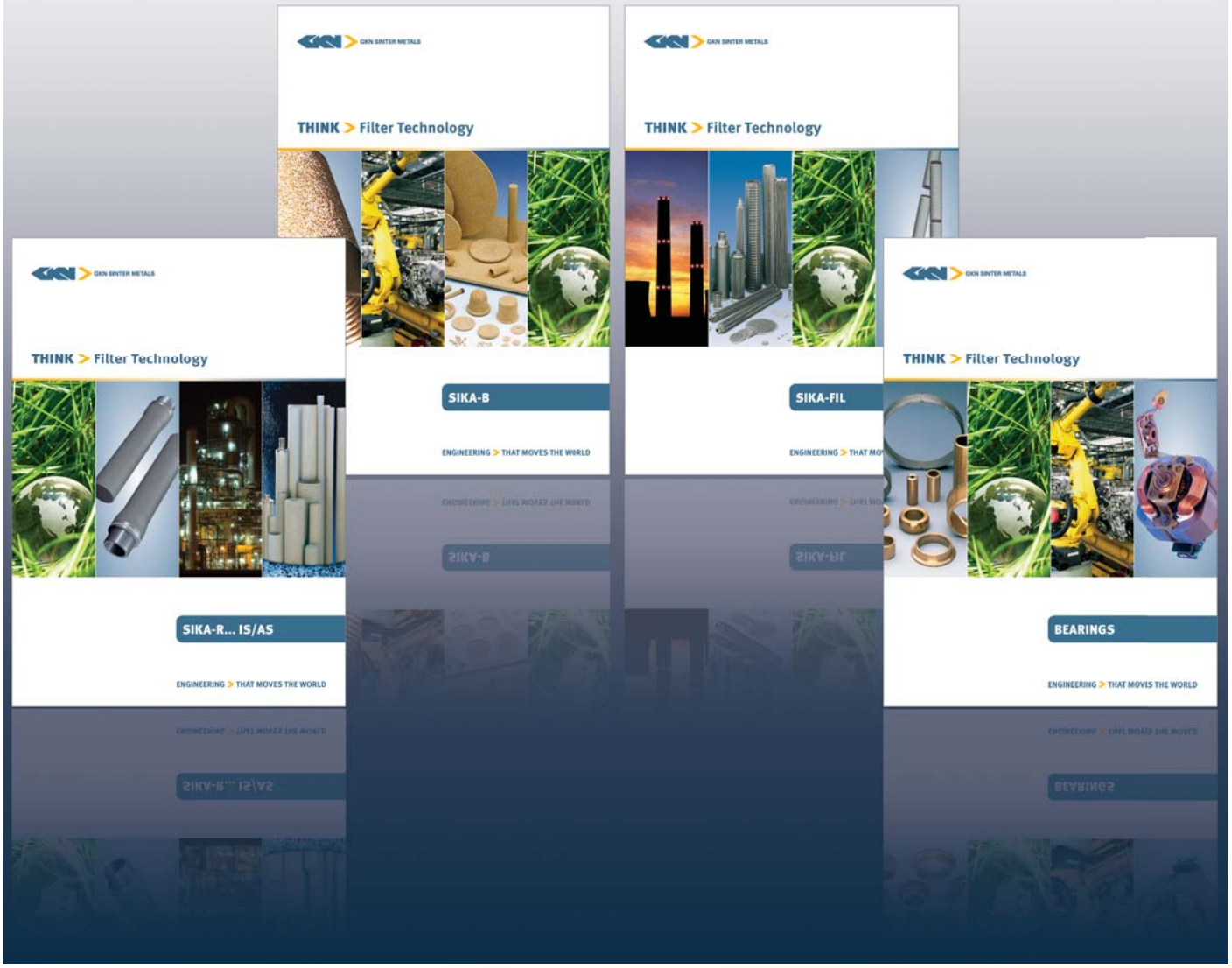
**Description** _____
_____
_____
Filter grade _____

**4. How will the SIKA element be applied?**

**Shape of the element** ◯ Tube ◯ Cartridge ◯ Sheet
◯ Disc ◯ Other
**Connecting element** ◯ Flange ◯ Thread ◯ Other
Housing diameter _____
Quantity _____

**5. Short description of the process:**

## Further Brochures Available



GKN SINTER METALS

**GKN Sinter Metals Filters GmbH**
Dahlienstraße 43
D-42477 Radevormwald
P.O. Box 1520
D-42464 Radevormwald
Phone: +49 (0) 2195-609-0
Fax: +49 (0) 2195-609-348
Email: info@gkn-filters.com
www.gkn.com/filters

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