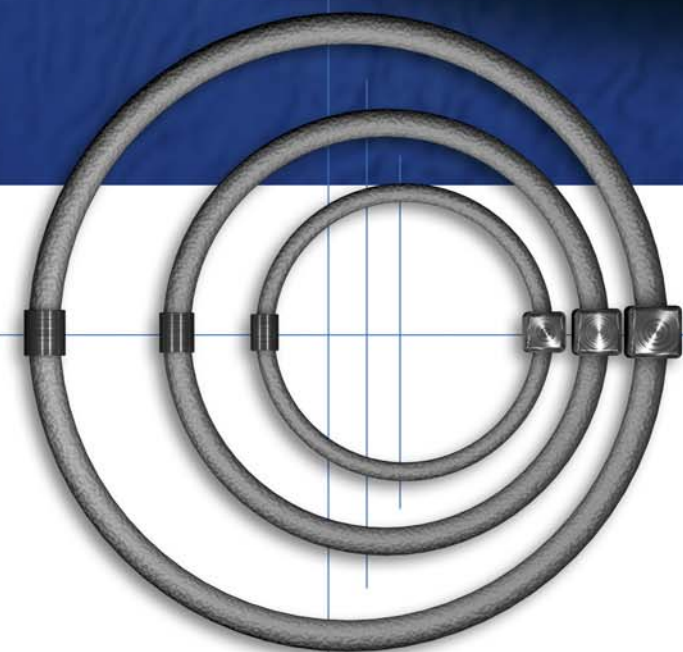


Static And Dynamic Spargers

SIKA®-R.../S + AX





Sparging with GKN SIKA porous metal:

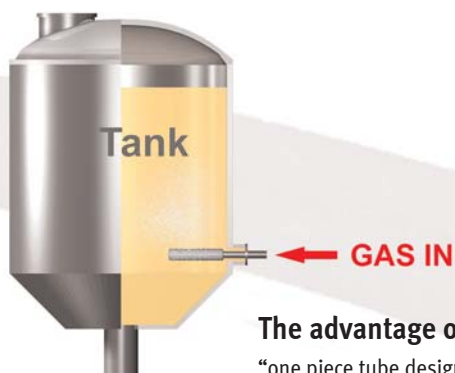
- uniform flow through whole construction
- uniform small bubbles for effective gas transfer
- long residence time of bubbles in liquid
- high contact area gas / liquid
- reduced dissolving time for gas in liquid
- reduced gas quantities for equal results (e.g. drilled pipes)
- 100% seamless construction for best corrosion resistance
- easiest installation

GKN spargers are available in several stainless steel alloys (standard is AISI 316L) as well as in nickel based alloys or titanium.

Pore sizes from 0.1 - 200 µm are available.

All spargers come together with customer designed connection, ready to be installed.

Example: beer brewery



The advantage of GKN spargers:
"one piece tube design"



No welding

- solid porous
 - porous - porous
- } = no corrosion!
= no cracks!

GKN serves

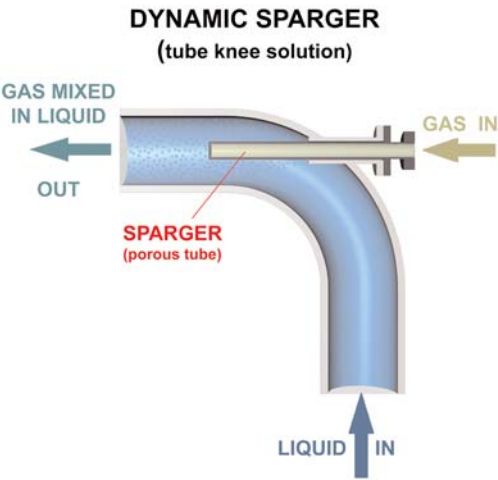
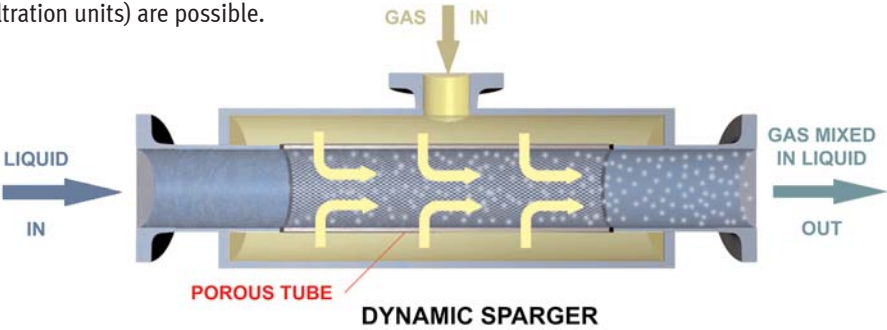
- Food and beverage industry
- Pharmaceutical industry
- Chemical & industrial industry
- Pulp and paper industry
- Petrochemical industry

With applications like:

- Aeration
- Agitation
- Bioremediation
- Carbonation
- Chlorine bleaching
- Column flotation
- Dewatering
- Fermentation
- Gas/liquid reactions
- Hydrogenation
- Oil flotation
- Oxygen
- Oxygen stripping
- Oxygenation
- Ozonation
- pH control
- Steam
- Volatiles stripping

Dynamic (in-line) spargers

Working principle: gas is pumped through a porous SIKA IS tube direct in to the pipeline. Using the velocity and turbulence of the flowing liquid, dynamic sparging is one of the cheapest and most efficient sparging systems. Due to the shear effect, extremely small gas bubbles are separated from the porous tube wall. For additional improvement of gas dissolving manifold construction (similar to cross flow filtration units) are possible.



Static (tank) spargers

Static sparging is usually used in batch productions and / or lower quantities of liquids. Designs with only one sparger as well as “christmas tree” shaped manifold designs are possible. GKN offers also the new seamless bended tube down to 400 mm diameter! Therefore also areas close to tank walls can be sparged efficient.



Example with one sparger



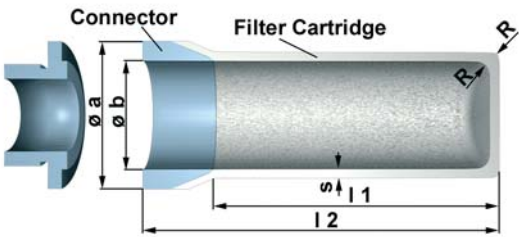
Example with three spargers (christmas tree)



Example with a bended tube (close to tank walls)

The advantage: seamless construction!

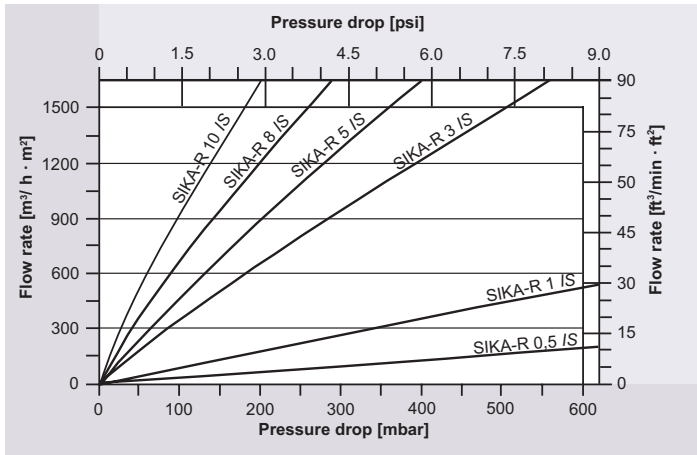
Solid connector sintered to porous body. **No welding - solid porous = no chance for corrosion**



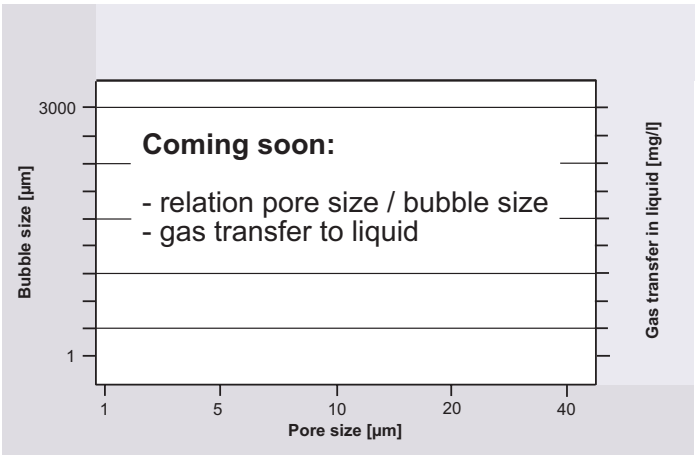
Filter connection at customers option (welded together with the seamless filter cartridge)



Examples of different thread connectors



Flow rate



Coming soon:

- relation pore size / bubble size
- gas transfer to liquid

Materials and products

Material Name	Wst-No	Sika-R...			FIL	B	Fe	Cr	Ni	C	Mo	Miscellany	Max. Temperature °C		Keyword
		IS	AX	AS									Reducing	Oxidizing	
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	540	400	Standard for foot application
	AISI 316 L	1.4404	x	x	x	x	Bal.	16.0-18.0	10.0-14.0	≤0.03	2.0-3.0	N≤0.1	540	400	
	AISI 904	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 hydrochloric acid
	AISI 310	1.4841				x	Bal.	24.0-26.0	19.0-22.0	≤0.25	-	-	800	600	Heat resistant
	FeCrAl Mod.	1.4767				x	Bal.	19.0-22.0	-	≤0.10	-	Al 5.0-6.5 with rare earth elements	unfit	1000	
Nickel based alloys*	Hasteloy 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 aggressive media. Duration application at > 400°C possible
	Hasteloy 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	
	Hasteloy 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	700	
	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
Other	CuSn 12	2.1052				x	-	-	-	-	-	Cu 89 Sn 11	300	250	Typically used for hydraulic & pneumatic
	Ti	-	x	x			-	-	-	-	-	Ti > 99%	500	500	Medicine, acid, electrolysis
Other materials on request															

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



SIKA-R...IS

- Made from sintered metal powder (A variety of alloys are used, depending upon requirement)
- Filter grades from 0.5 - 200µm
- The opportunity to use different alloys allows for use up to 950 °C
- Seamless up to 1500 mm in length and up to 300 mm in diameter



SIKA-R...IS

- Produced from stainless steel fibers
- 60 - 90 % porosity
- Filter grades from 1 - 100 µm
- Employed mainly in gas filtration with high gas velocities



SIKA-R...AX

- Axial pressed filters made of metal powder (A variety of alloys are used, depending upon requirement)
- Filter grades between 0.5 and 200 µm
- Employed mainly in gas and liquid filtration



SIKA-R...B

- Gravity sintered filters made of bronze
- Filter grades between 8 and 200 µm
- Employed mainly in pneumatic - hydraulic application and polymer filtration
- Best for complex shapes



SIKA...AS

- Asymmetric designed powder / powder composite, consisting of a coarse support and a thin filter active layer of the SAME alloy
- Developed for surface filtration (up to four times higher flow rates with improved backflushing performance)
- Employed in catalyst recovery and cross flow application



SIKA- Modules

- Customer designed elements with fitting
- Possible for guaranteed flow or pressure drop
- Employed mainly for sensor protection and flow resistors
- Welding constructions

ISO 9001 Certified



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