Absorption Technology **Reference List**
Flue Gas Desulphurisation & Treatment Plants
Air Pollution Control Systems and Process Units for sulphur-rich waste gases

STEULER

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
1	**Industrie Abwasserverband, D - Altena / Westfalen**								SAB
	Waste water treatment plant	100	< 50	H_2SO_4	500	20	H2O	1980	
	Turnkey delivery			HCl		50			
				HNO_3		20			
2	**Merck, D - Darmstadt**								SAB
	Chemical production unit	2 x 1.000	> 200	SO_2			NaOH	1980	
	Turnkey delivery			HCl					
				sulphonation					
3	**Merck/Werk Gernsheim, D - Darmstadt**								SAB
	Chemical production unit Turnkey delivery	800	>200	H_2S	100 ppm	< 1 ppm	NaOH	1982	
4	**Steuler-Industriewerke, D - Höhr-Grenzhausen**								SAB
	flue gases from 1 shuttle kiln and	21.000	max. 250	SO_2	200	< 50	$Ca(OH)_2$	1983	
	3 tunnel furnaces			HF	50	< 3			
	Turnkey delivery			dust	10	< 10			
5	**Luwa GmbH, Niederlassung Hamburg**								SAB
	Industrial process	1.500		H_2SO_4	1000	50	KOH	1983	
	Turnkey delivery			HNO_3					
				H_3PO_4					
				HCl					
6	**Gebr. Reinhardt KG, D-Stettfeld/Bamberg**								SAB
	Turnkey delivery	700 - 1.500	120-140	HF	60	< 2	$Ca(OH)_2$	1984	
7	**Ichendorfer Dorotheenhütte, D-Bergheim-Ichendorf**								SAB
	waste air containing HF(glass-polishing installation) Turnkey delivery	8.000	appr. 50	HF/SiF_4	F max. 400	F < 4	$Ca(OH)_2$	1984	
8	**Kali-Chemie AG, D - Bad Wimpfen**								SAB
	reduction of sulphur dioxide Turnkey delivery	12.000	appr. 30	SO_2	10.000	< 1000	$Ca(OH)_2$	1984	

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9	**Bayer AG, D - Leverkusen**								SAB
	Chemical production unit	1.000	50	HF	700	50	NaOH	1985	
	Turnkey delivery			SO_2					
				SiF_4					
10	**Metallurgie Hoboken-Overpelt, B - Olen**								SAB
	Metallurgical process	200	60	H_2SO_4	5000 - 10000	50	KOH	1985	
	Turnkey delivery			HCl					
11	**Metallurgie Hoboken-Overpelt, B - Olen**								SAB
	Metallurgical process Turnkey delivery	50.000	>100	H_2SO_4	500	200		1985	
12	**Metallurgie Hoboken-Overpelt, B - Olen**								SAB
	Metallurgical process Turnkey delivery	2.500	200	SO_2	500	200		1985	
13	**Power Plant Fenne/Völklingen (Saarberg), Germany**								SKC
	Thermal Power Plant /Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering	500 MW		SO_x HCl, HF			$CaCO_3$	1987	
14	**H.C. Starck, D - Goslar**								SAB
	Metallurgical process	6.000		SO_2	5000	500		1987	
	Turnkey delivery			Cl_2, HCl	100	10			
				NOx					
15	**Wesero, D - Sprockhövel**								SAB
	Exhaust gas treatment of a stainless steel pickling plant Turnkey delivery	1.300	50	H_2SO_4	1500	100	H_2O	1987	
16	**Metallurgie Hoboken-Overpelt, B - Olen**								SAB
	Acid vapour treatment plant	1 x 300	50	H_2SO_4	5000		H_2O	1987	
	Turnkey delivery	1 x 200		HCl					

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	Böhler & Sohn GmbH, A - Feldkirch-Gisingen								SAB
17	reduction of pollutants containing SO_2-, HCl-	max. 2.000	max. 180	HCl	3.000	< 30	$Ca(OH)_2$	1987	
	and HF- coming from the combustion furnace of a			SO_2	1.000	< 250			
	hospital refuse incinerating furnace.								
	Turnkey delivery			HF	50	< 0,7			
	Lias, D - Tuningen								SAB
18	separation of SO_2 coming from a light expanded	appr. 40000	200-250	SO_2	appr. 6000	< 500	$Ca(OH)_2$	1987	
	clay aggregate installation			HF	appr.30	< 5			
	End Product: gypsum, waste-water free								
	Fuel: carbon powder, HFO, digester gas								
	Turnkey delivery								
	BHKW, D - Helgoland								SAB
19	Flue Gas Desulphurisation for a heavy fuel oil fired	max. 30.000	appr. 180	SO_2	appr. 2.000	< 200	$Ca(OH)_2$	1988	
	island heat & power station, consisting out of Generators			NO_x	approx. 5000	500	SCR-/DeNOx		
	and (3) heating boilers								
	End Product: gypsum, waste water free								
	Fuel: HFO with 1% - 3% sulphur content								
	Turnkey delivery								
	Allg. Gold- & Silberscheideanstalt, D - Pforzheim								SAB
20	Exhaust gas treatment of a facility	1 x 800	80	SO_2	approx. 4000	50	base	1988	
	for precious metal recovery and processing	1 x 1.200		NOx	approx. 1500	200			
	Turnkey delivery			Cl_2	approx. 5000	10			
				NH_4OH					
	BASF AG, D-Köln								SAB
21	Exhaust gas treatment of a chemical plant	200		SO_2	3500	in sum 200	base	1988	
	Turnkey delivery			SO_3	3500	"			
				NOx	1000	350			

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	Wesero, D - Sprockhövel								SAB
22	Vapour treatment of a metal processing factory	1 x 2.000	40	H_2SO_4	2500	100	H_2O	1988	
	Turnkey delivery	1 x 1.500		H_2O_2					
	Ruwel Werke, D - Goch								SAB
23	Turnkey delivery	7.000	< 150	SO_2			NaOH	1988	
				HCl					
				Cl_2					
	Degussa, D - Hanau								SAB
	Exhaust gas treatment of a chemical production unit	38.000	< 100	SO_2	4000	200	H_2O_2, H_2O	1988	
	Turnkey delivery			HCl	1000	10			
24				HF	50	5			
				HBr					
				HJ					
				Cl_2					
	Power Plant Weser, Veltheim; Germany								SKC
25	Thermal Power Plant /Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering	350 MW		SO_x HCl, HF			$CaCO_3$	1988	
	Gebr. Böhler AG, D - Düsseldorf								SAB
26	Metal processing plant	70.000		H_2SO_4	2000	200		1989	
	Turnkey delivery			HCl	1000	20			
				HNO_3					
	Westfälische Union AG, D - Lippstadt								SAB
27	Exhaust gas treatment of a pickling process Turn-key delivery	2 x 8.000	40 - 70	H_2SO_4	1500	50	H_2O	1989	
	Miele & Co., D - Gütersloh								SAB
28	Exhaust gas treatment of a pickling process Turnkey delivery	2 x 40.000	50	H_2SO_4	1000	30	H_2O/NaOH	1989	

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	Miele & Co., D - Gütersloh								SAB
29	Exhaust gas treatment of a pickling process Turnkey delivery	5.000	50	H_2SO_4	1000	30		1989	
	Metal Processing Plant								SAB
30	Metal processing plant Turnkey delivery	30.000	50	H_2SO_4	1200	10	base	1989	
	Power Plant Bexbach (Saarberg), GERMANY								SKC
31	Thermal Power Plant /Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering	773 MW		SO_x HCl, HF			$CaCO_3$	1989	
	Power Plant Weiher (Saarberg), Germany								SKC
32	Thermal Power Plant /Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	707 MW		SO_x HCl, HF			$CaCO_3$	1989	
	Power Plant Eschweiler/Weisweiler (RWE), Germany								SKC
33	Thermal Power Plant /Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	500 MW		SO_x HCl, HF			$CaCO_3$	1989	
	Power Plant Petershagen (Preußen Elektra), Germany								SKC
34	Thermal Power Plant /Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering	900 MW		SO_x HCl, HF			$CaCO_3$	1989	
	Lias, D - Pautzfeld								SAB
35	separation of SO_2 coming from a light	appr. 70000	180-250	SO_2	max. 8000	< 500	$CaCO_3$	1990	
	expanded clay aggregate installation			HF	max. 25	< 5			
	End Product: gypsum, waste-water free			HCl	max. 18	< 5			
	Fuel: carbon powder, HFO, digester gas Turnkey delivery								

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	Power Plant Neurath, Köln; Germany								SKC
36	Thermal Power Plant /Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	500 MW		SO_x HCl, HF			$CaCO_3$	1993	
	Power Plant Poczerady, Czechoslowakia								SKC
37	Thermal Power Plant /Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	300 MW		SO_x HCl, HF			$CaCO_3$	1993	
	Heidelberger Druckmaschinen, D - Amstetten								SAB
38	SO_2 separation from a sand regeneration system	6.000	106-180	SO_x	10.330	< 500	$Ca(OH)_2$	1993	
	Turnkey delivery			SO_x	6.954	< 150			
	Korean Zinc - Ulsan / Korea								SAB
39	SO_2 separation from a flue gas of a Zn Furnace Turnkey delivery	76.000	max. 395	SO_2	18.000	< 285	ZnO	1995	
	Power Plant Meri-Pori, Finland								SKC
40	Thermal Power Plant /Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Lining, Engineering			SO_x HCl, HF			$CaCO_3$	1995	
	Power Plant Giershagen, Germany								SKC
41	Industrial Power Plant /Flue gas desulphurisation Fuel: Oil FGD Key Process Equipment, Tanks, Engineering	100 MW		SO_x HCl, HF			$CaCO_3$	1996	
	Power Plant Aue, Germany								SKC
42	Industrial Power Plant /Flue gas desulphurisation Fuel: HFO FGD Key Process Equipment, Tanks, Engineering	50 MW		SO_x HCl, HF			$CaCO_3$	1996	

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	Degussa, D - Hanau								SAB
43	SO_2, HCl, HF, HBr, HJ, Cl_2	35.000	150	SO_2		< 50	NaOH	1996	
	separation from a incinerator			HCl		< 10			
	Turnkey delivery			HF		< 1			
				HBr		< 1			
				HJ		< 1			
				Cl_2		< 1			
				dust		< 10			
	Heraeus, D - Hanau								SAB
44	SO_2, HCl, HF, dust, dioxin separation from a	3.000	250	SO_2	2940	< 50		1996	
	incinerator			HCl, Cl_2	835	< 10			
	Turnkey delivery			HF	11	< 1			
				dust	1360	< 10			
				PCDD/F	5 ng / Nm³	< 0,1 ng / Nm³			
	Power Plant Opole, Poland								SKC
45	Thermal Power Plant /Flue gas desulphurisation			SO_x			$CaCO_3$	1997	
	Fuel: Black Coal	4 x 250 MW		HCl, HF					
	FGD Key Process Equipment, Tanks, Engineering								
	Based on a contractual agreement of confidence, customer and location shall be unnamed								SAB
46	SOx reduction in exhaust gas of a roaster	appr. 25.000	appr. 250	SO_2	7.000	< 300	$CaCO_3$	1997	
	Turnkey delivery				max. 14.000				
	Thermoselect Karlsruhe, Germany								SKC
47	Waste Pyrolysis Process / Waste Incinerator	92.000	300	SO_2			H2O	1998	
	Hot Gas Pyrolysis HCl/HF Pre-Scrubber quenche	(2x46.000)		HCl, HF	500	50	Urea		
	(2) SCR-/DeNOx-catalyst systems with urea solution make-up facility			NOx			H_2O		
	Key component delivery of Flue Gas Treatment Plant			various pollutants					

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	Power Plant Petershagen (new), Germany								SKC
48	Thermal Power Plant /Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Tanks, Engineering	700 MW		SO_x HCl, HF			$CaCO_3$		
	upgrade	910 MW						2001	
	Thermal Ceramics, I - Casalpusterlengo								SAB
49	separation of SO2 from a kiln burning insulating refractory End Product: gypsum, waste water free Turnkey delivery	appr. 23.000	appr. 20-240	SO_2	max. 14.000	< 500	$CaCO_3$	1998	
	Power Plant Frimmersdorf, Germany								SKC
50	Thermal Power Plant /Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Tanks, Engineering	300 MW		SO_x HCl, HF			$CaCO_3$	1999	
	Japan								SKC
51	Waste Pyrolysis Process / Waste Incinerator Bekaplast f Hot Gas Pyrolysis HCl Pre-Scrubber Quenche Sump	92.000	300	SO_2 HCl			$CaCO_3$ H_2O	1999	
	Key component delivery of Flue Gas Treatment Plant			various pollutants					
	Technip Germany, IDD - Portugal								SAB
52	Exhaust gas treatment plant for high contaminated	120	250-400	Hg	0,5 µg	0,15 µg	H2O2, HCl	2000	
	and toxic flue gases coming from an			SO_2	12.000	< 50	NaOH		
	ammution blasting and combustion plant			HCl	8.000	< 10			
	in acc. of EC Directive 94/67 resp. 17. BImSchV			HF	approx. 200	< 1			
				dust	50.000-300.000	< 10	cyclone		
	note: Waste water prevention by vacuum evaporator			CO	1.000	50			
				TOC		10			
	Turnkey delivery			NOx	14.000	< 200	SCR-/DeNOx		
				PCDD/F	10 ng/Nm³	< 0,1 ng/Nm³	SCC/cat		
				Aerosoles and heavy metals					

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	Power Plant Dolna Odra, Poland								SKC
53	Thermal Power Plant /Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Tanks, Engineering	400 MW		SO_x HCl, HF			$CaCO_3$	2000	
	Power Plant Niederaußem, Germany								SKC
54	Thermal Power Plant /Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Tanks, Engineering	2 x 175 MW		SO_x HCl, HF			$CaCO_3$	2000	
	Power Plant Maritsa II, Bulgary								SKC
55	Thermal Power Plant /Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Tanks, Lining, Engineering	650 MW		SO_x HCl, HF			$CaCO_3$	2001	
	MAN B&W AG, Augsburg, Germany								SAB
56	Flue Gas Desulphurisation Birlik Enerji, Turkey, Heavy fuel oil fired power station with 38 Mwel/100 MWth capacity Bekaplast/concrete composite scrubber construction	230.000	220-450	SO_2	5.940-8.500	1.000	$CaCO_3$	2002	
	FGD End Product: gypsum, waste water free Fuel: HFO # 6 with 3% - 5% sulphur content Turnkey delivery	38 MW							
	Barmek Gama Ankara, Turkey - Power Plant Kirikkale								SAB
57	FGD Barmek Gama Kirikkale, Heavy fuel oil fired power station with 130 MWel/300 MWth capacity (2) Flue Gas Desulphurisation Plants in Bekaplast/concrete composite scrubber construction plus (4) SCR-/DeNOx-catalyst plants for cleaning the flue gases coming out of in total 13 gen-set`s, each with 10 MWel/23 MWth.	348.000 406.000	220-450	SO_2	6.000 - 8.500	800	$CaCO_3$	2002	
	FGD End Product: gypsum, waste water free	130 MW		NO_x	6.000	800	SCR-/DeNOx		
	Fuel: HFO # 6 with 3,5% - 5% sulphur content Turnkey delivery								

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	Power Plant BKB Buschhaus, Germany								SKC
58	Thermal Power Plant /Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Tanks, Lining, Engineering	600 MW		SO_x HCl, HF			$CaCO_3$	2002	
	FGD Untervaz, Holcim Cement AG, Switzerland								SKC
59	Flue gas desulphurisation for cement plant FGD scrubber tower in Bekaplast/concrete composite, complete with directly related key process components	450.000		SO_x HCl, HF			$CaCO_3$	2003	
	FGD Cottam Power Block 2&3, Great-Britain								SKC
60	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Tanks, Lining, Engineering	2 x 160 MW		SO_x HCl, HF			$CaCO_3$	2003-2004	
	Power Plant/Flue Gas Desulphurisation Maritza East III, Bulgary								SKC
61	Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Tanks, Lining, Engineering	650 MW		SO_x HCl, HF			$CaCO_3$	2004	
	Recycling Kombinatie Rotterdam, Netherlands								SAB
62	**Feasibility Study Advanced Basic Engineering of the Planning, Delivery and Turn-key erection of an Industrial Waste Incinerator Plant with Heat Recovery & advanced Flue Gas Treatment plant in accordance of EC Directive 94/67 resp. 17. BImSchV**							2004	
	Environmental Process Plant Concept Study, focussing the energy and utility optimised operation of a future orientated multi-stage Flue Gas Cleaning Plant, based on "Best Available Technologies" for de-dusting, PCDD/F and Heavy Metal & Mercury recovery, SCR-/DeNOx catalyses and wet scrubbing of flue gases, based on lime/gypsum process. **Energy Recovery and Generator Plant**								

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
	Furthermore, economical production of electricity needed by the entire Plant in Island operation, incl. (3) combustion lines with coolers and site facilities by operation of (3) independant Waste Heat Recovery Boilers and (1) Steam Turbine Generator.								
	Power Plant/Flue Gas Desulphurisation Tangshan, P.R. of China								SKC
63	Flue gas desulphurisation Fuel: Coal suspension coarse sieve baskets and accessories			SO_x HCl, HF			$CaCO_3$	2004	
	Power Plant/Flue Gas Desulphurisation Hengshui, P.R. of China								SKC
64	Flue gas desulphurisation Fuel: Coal suspension coarse sieve baskets and accessories			SO_x HCl, HF			$CaCO_3$	2004	
	FGD Ansaes, Denmark								SKC
65	Flue gas desulphurisation Fuel: Heavy Fuel Oil FGD Key Process Equipment, Tanks, Bekaplast Lining Engineering	600 MW		SO_x HCl, HF			$CaCO_3$	2004	
	FGD Voerde, Germany								SKC
66	Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Tanks, Engineering	2 x 700 MW		SO_x HCl, HF			$CaCO_3$	2004	
	Power Plant/Flue Gas Desulphurisation Zhengjiang, P.R. of China								SKC
67	Flue gas desulphurisation Fuel: Coal suspension coarse sieve baskets and accessories			SO_x HCl, HF			$CaCO_3$	2005	
	Power Plant/Flue Gas Desulphurisation Huangpu, P.R. of China								SKC
68	Flue gas desulphurisation Fuel: Coal suspension coarse sieve baskets and accessories			SO_x HCl, HF			$CaCO_3$	2005	

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	FGD Mason City, USA (Iowa)								SKC
69	Flue gas desulphurisation of a cement plant FGD scrubber tower in Bekaplast/concrete composite with directly related key components	400.000		SO_x HCl, HF			$CaCO_3$	2004	
	Power Plant/Flue Gas Desulphurisation Changzhou, P.R. of China								SKC
70	Flue gas desulphurisation Fuel: Coal suspension coarse sieve baskets and accessories			SO_x HCl, HF			$CaCO_3$	2005	
	Power Plant/Flue Gas Desulphurisation Datong, P.R. of China								SKC
71	Flue gas desulphurisation Fuel: Coal suspension coarse sieve baskets and accessories			SO_x HCl, HF			$CaCO_3$	2005	
	Power Plant/Flue Gas Desulphurisation Ligang, P.R. of China								SKC
72	Flue gas desulphurisation Fuel: Coal suspension coarse sieve baskets and accessories			SO_x HCl, HF			$CaCO_3$	2005	
	FGD Cottham Power Block 1&4, Great Britain								SKC
73	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Tanks, Engineering	2 x 160 MW		SO_x HCl, HF			$CaCO_3$	2005	
	Power Plant/Flue Gas Desulphurisation Dayou Development Ltd., Hong Kong								SKC
74	Flue gas desulphurisation Fuel: Coal suspension coarse sieve baskets and accessories			SO_x HCl, HF			$CaCO_3$	2005	
	Power Plant/Flue Gas Desulphurisation Zhangqui, P.R. of China								SKC
75	Flue gas desulphurisation Fuel: Coal suspension coarse sieve baskets and accessories			SO_x HCl, HF			$CaCO_3$	2006	

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
	FGD Cottham Power Block 1&4, Great Britain								SKC
76	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Tanks, Engineering	2 x 160 MW		SO_x HCl, HF			$CaCO_3$	2005	
	Bentum Recycling Centrale, Utrecht, NL								SAB
77	**Turn-key Heat Recovery & Flue Gas Treatment plant for thermal tar recycling & incineration process, mainly consisting out of:**							2005/2006	
	Flue GasTreatment Plant in acc of EC Directive 94/67	3 x 42.000	900 to 70	Hg	0,10	0,04			
	(3) PTFE baghouse filter with integrated coolers, intermediate 500 m³ dust storage facility;			HM Sb-Cc	100	0,5			
	(2) lignite coke/lime with integrated coolers, operated Fly-Stream filter, PTFE;			HM Cd+Tl	10	0,05			
	(1) SCR-/DeNOx Plant, urea based & energy optimised;			SO_2	4.200	70			
	(1) tail-end wet FGD lime scrubber with high-performance multi stage mist eliminator and machinery building;			HCl	60	< 10			
	reusable desalined gypsum as end-product			HF	60	< 1			
	Exhaust gas blower stages, FC controlled			dust	55.000	< 10			
				NOx	400	< 70			
				PCDD/F	1 ng/Nm³	< 0,1 ng/Nm³			
	Waste Heat Recovery Boiler, mainly consisting out of: (3) middle pressure steam boilers with Superheater and Economiser equipped with shotblaster facilities, steam drums and steam distribution pipe work			3 x 17 to 28 bar, 250°C					
	Steam Turbine Generator Set, Multi-stage, complete			5,6 MW/7013 VA; 6,3 kV					
	FGD Trobovje, Slovenia								SKC
78	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Tanks, Engineering	150 MW		SO_x HCl, HF			$CaCO_3$	2005	

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
79	**FGD Bergkamen, Germany** Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering	160 MW		SO_x HCl, HF			$CaCO_3$	2005	SKC
80	**FGD Werne, Germany** Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering	160 MW		SO_x HCl, HF			$CaCO_3$	2005	SKC
81	**FGD Frimmersdorf Block Q, Germany** Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	300 MW		SO_x HCl, HF			$CaCO_3$	2005	SKC
82	**FGD Ningde Power Plant 3&4, P.R.China** Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering	400 MW		SO_x HCl, HF			$CaCO_3$	2006	SKC
83	**FGD Zhuhai Power Plant, P.R.China** Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering	600 MW		SO_x HCl, HF			$CaCO_3$	2006	SKC
84	**FGD Pirdop Power Plant, Bulgaria** Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering			SO_x HCl, HF			$CaCO_3$	2006	SKC
85	**FGD BOA 2/3 Neurath Power Plant, Germany (Lignite coal optimised power plant)** Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, 2 FGD towers + 1 tank in Bekaplast/concrete composite complete, Engineering	2x1100 MW		SO_x HCl, HF			$CaCO_3$	2007	SKC

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
	FGD Hongsheng Power Plant, P.R.China								SKC
86	Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering	2 x 300 MW		SO_x HCl, HF			$CaCO_3$	2006	
	FGD Frimmersdorf Block P, Germany								SKC
87	Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	300 MW		SO_x HCl, HF			$CaCO_3$	2005	
	FGD Trobovje, Slovenia								SKC
88	Flue gas desulphurisation of a cement plant FGD scrubber tower in Bekaplast/concrete composite with directly related key components	400.000		SO_x HCl, HF			$CaCO_3$	2007	
	FGD Rybnik, Poland								SKC
89	Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering			SO_x HCl, HF			$CaCO_3$	2007	
	FGD Rugeley, Great-Britain								SKC
90	Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering			SO_x HCl, HF			$CaCO_3$	2007	
	FGD Fiddlers Ferry, Great-Britain								SKC
91	Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering			SO_x HCl, HF			$CaCO_3$	2007	
	FGD Fiddlers Ferry, Great-Britain								SKC
92	Flue gas desulphurisation Fuel: Hard Coal FGD Key Process Equipment, Engineering			SO_x HCl, HF			$CaCO_3$	2007	

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
93	**FGD Tusimice II, Czech Republic**								SKC
	Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	4 x 200 MW		SO_x HCl, HF			$CaCO_3$	2007	
94	**FGD Gersteinwerke (RWE Power), Germany**								SKC
	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering			SO_x HCl, HF			$CaCO_3$	2007	
95	**Slavex, CR, Combined Heat&Power Plant**								SAB
	(1) Flue Gas Desulphurisation Plant Limestone/gypsum scrubber, waste-water free operation Black Coal Engineering / License, Delivery of major key equipment and site services	225.000	180-200	SO_2	4.000	500	$CaCO_3$	2007	
96	**China Petro Urimqi Fertilzer Plant**								SAB
	2 stage NH3 DeSOx plant 2x210 to/h coal fired steam boilers (1) FGD Quench scrubber Main DeSOx free space scrubber (1) FGD scrubber based on NH3 process with fertilizer end-product [NH4]2SO4 Advanced Basic Engineering, Delivery of complete scrubber lining and site services	 505.000 520.000	 130 - 200 max 230 80	 SO_2 SO_2	 1.500	 75	 process water NH3 aquaous solution	 2007 2007	

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
	Liapor GmbH, D - Hallersdorf-Pautzfeld								SAB
97	retrofit of an existing wet FGD plant for swelling clay production to reach clean gas values of 17. BImSchV 5a (substitution fuel firing with mixed plastic waste)	75.000	180-250	SO_2 HF HCl	max. 8000 max. 25 max. 18	< 500 < 1 < 1	$CaCO_3$	2007	
	Tractebel Energia Suez, UTCH Charqueadas, Brazil								SAB
98	Coal fired Thermal Power Plant UTCH Limestone/gypsum scrubber, waste-water free operation Black Coal turn-key delivery	460.000	180-250	SO_2 HF HCl	max. 4000	< 400 < 1 < 1	$CaCO_3$	2007	
	FGD Mehrum, Germany								SKC
99	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering	750 MW		SO_x HCl, HF			$CaCO_3$	2008	
	FGD Bergkamen, Germany								SKC
100	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering	750 MW		SO_x HCl, HF			$CaCO_3$	2008	
	Thermal Ceramics, Casalpusterlemgo, Italy								SAB
101	retrofit, uograde and modernising of an existing wet FGD plant, used in a refractory material calcination process	appr. 40.000	130	SO_2	~ 14.000	~ 1.000	$CaCO_3$	2008	
	FGD RWE Weisweiler, Germany								SKC
102	Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering			SO_x HCl, HF			$CaCO_3$	2009	
	Industrial Waste Incinerator (confidential)								SAB

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
103	**Turn-key Incinerator and Flue Gas Treatment plant for industrial waste, mainly consisting out of:** Flue GasTreatment Plant in acc of EC Directive 94/67 Incineration chamber, batch processed, HT brick lining Secondary Combustion Chamber, high-temperature type 1.400°C Water injection quenche step cooler 3 step heat recovery system (reheating) (1) PTFE baghouse filter for FG treatment (1) wet scrubber with high-performance mist eliminator, ETCFE material; (1) lignite coke/lime Fly-Stream filter, PTFE; (1) SCR-/DeNOx-PCDD/F Plant, urea based Exhaust gas blower stages, FC controlled complete turn-key erection Energy saving package	2 x 1500	900	emissions in mg/Nm³, dry, 11 vol.-% O2 CO TOC Hg HM Sb-Cc HM Cd+Tl SO_2 HCl HF dust NOx PCDD/F	 unknown 0,10 100 10 7.000 25.000 17.000 3.000 2.500 10 ng/Nm³	 50 10 0,03 0,5 0,05 50 < 10 < 1 < 10 < 70 < 0,1 ng/Nm³		2009	
104	**Carbon Capturing Scrubber - designed as pilot plant, country, location and client is strictly confidential** Downstream of wet Flue Gas Desulphurisation Fuel: Coal CC scrubber towers in Bekaplast/concrete composite technology process and design data are confidential			CO_2		classified	confidential	2010	SKC
105	**FGD RDK8, Karlsruhe, Germany** Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering	910 MW		SO_x HCl, HF			$CaCO_3$	2010	SKC
106	**FGD Turceni, Romania** Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	4 x 330MW		SO_x HCl, HF			$CaCO_3$	2011	SKC
	2 FGD Refinery Slovnaft, Bratislava, SR Flue Gas Desulphurisation								SKC

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
107	Fuel: HFO 2 FGD towers in Bekaplast/concrete composite complete each tower 8 m diameter, 28 m height FGD Key Process Equipment, 3 Spray banks, 2 ME	500.000 Nm³/h 60°C	170°C	SO_x			$CaCO_3$	2011	
	FGD Ledvice, Czech Republic								SKC
108	Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	660 MW		SO_x HCl, HF			$CaCO_3$	2011	
	Carbon Capturing Scrubber - designed as pilot plant, country, location and client is strictly confidential								SKC
109	Downstream of wet Flue Gas Desulphurisation Fuel: Coal CC scrubber towers in Bekaplast/concrete composite technology process and design data are confidential			CO_2		classified	confidential	2011	
	FGD Bergkamen, Germany								SKC
110	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering	750 MW		SO_x HCl, HF			$CaCO_3$	2011	
	2 wet Flue Gas Chimneys in Bekaplast Concrete Composite Technology (Polyethylene)								SKC
111	wet cold VOC containing clean gases coming from scrubbers in a chemical production plant free standing; diameter 5 m, 90 m height above ground	per unit 90.000 Nm/h	80°C	VOC and rest acids				2011/12	
	FGD Datteln, Germany								SKC
112	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering			SO_x HCl, HF			$CaCO_3$	2012	
	FGD Maasvlakte, Netherlands								SKC
113	Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering			SO_x HCl, HF			$CaCO_3$	2012	
	FGD Triangel Lünen, Germany								SKC

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
114	Flue Gas Desulphurisation Fuel: Coal 1 FGD tower in Bekaplast/concrete composite complete 16 m diameter, 34 m height FGD Key Process Equipment, 4 Spray banks, 2 ME	500 MW 2 Mio Nm³/h 55°C	130°C	SO_x HCl, HF			$CaCO_3$	2012	
115	**FGD Cement factory LaFarge, Alpena, USA** Flue gas desulphurisation of a cement plant FGD scrubber tower in Bekaplast/concrete composite with directly related key components	500.000		SO_x HCl, HF			$CaCO_3$	2013	SKC
116	**FGD Ibbenbüren, Germany** Flue gas desulphurisation Fuel: Black Coal FGD Key Process Equipment, Engineering	838 MW		SO_x HCl, HF			$CaCO_3$	2013	SKC
117	**Waste Incineration Plant Vale, Brazil** Dry Flue Gas Cleaning Plant for industrial waste incineration plant Fuel: industrial waste Engineering and supply of heat exchanger, sodium bicarbonate storage and milling system, activated coal dosing, bag filter, fans, chimney, EI&C equipment	8.800 Nm³/h	220 - 280°C	SO_x HCl Fly ash PCDD/F	230 260 2.900 3 ng	< 280 < 80 <70 < 0,5 ng	$NaHCO_3$	cancelled by client	SAB
118	**FGD Prunerov, Czech Republic** Flue gas desulphurisation Fuel: Lignite Coal FGD Key Process Equipment, Engineering	3 x 250 MW		SO_x HCl, HF			$CaCO_3$	2014	SKC
119	**FGD USS K7, Košice, Slowak Republic** Flue gas desulphurisation Fuel: Black Coal Engineering / License, Delivery of major key equipment and site services	330.000 Nm³/h		SO_x HCl	6600 / max 8500	< 120 / < 200	$CaCO_3$	2016	SAB
	Heraeus, D - confidentially agreement SO_2, HCl, HF, dust, dioxin separation from a			SO_2				2015	SAB

Absorption Technology **Reference List**

Flue Gas Desulphurisation & Treatment Plants

Air Pollution Control Systems and Process Units for sulphur-rich waste gases

Reference	Application	Flow Rate [Nm3/h] or MWth	Temperature Entry [°C]	Pollutant	Pollutant-Concentration Inlet [mg/Nm³]	Pollutant-concentration outlet [mg/Nm³]	Absorbent	Commissioning	Responsible company division
120	industrial waste incineration plant complete reconstruction of the thermal energy recovery section			HCl, Cl_2 HF dust PCDD/F					
121	**FGD USS K6, Košice, Slowak Republic** Flue gas desulphurisation Fuel: Black Coal Engineering / License, Delivery of major key equipment and site services	330.000 Nm³/h		SO_x HCl	6600 / max 8500	< 120 / < 200	$CaCO_3$	2017	SAB
122	**Made Vila, Sao Paulo, Brasil** tailored and high efficient FGT plant Production facility of wooden-made parts, Biomass Plant turn-key application	15.000 Nm³/h 30.000 Nm³/h	250°C	particles and other harmful pollutants				2015	SBR
123	**Bioenergy, Sao Paulo, Brasil** Particulate precipitation Fuel: Biomass Engineering / License, Delivery of baghouse filter	37.700 m³/h		dust	500	<50		2015	SAB

SAB = Steuler Anlagenbau GmbH & Co KG

SKC = Steuler KCH GmbH (resp. Steuler Industrieller Korrosionsschutz SIK before 2011)

SBR = Steuler do Brasil (Subsidiary of Steuler Anlagenbau)