

## REFERENCE LIST

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# Treatment of Wastewater

Metal Finishing Industry  
Aerospace & Transport



Client	Plant Type	Capacity
GE Caledonian Prestwick, UK	<p><b>Treatment of wastewater from metal finishing</b></p> <p>Twin stream system for</p> <p>a. Metal-containing wastewater:</p> <ul style="list-style-type: none"> <li>Initial transfer tank &amp; transfer pumps</li> <li>Incoming Balance tank &amp; transfer pumps</li> <li>Chromium reduction, pH correction, Flocculation</li> <li>Lamella tube Settler.</li> <li>Sludge collection and filter press</li> <li>Automatic pH probe cleaning system</li> <li>Dosing systems for H<sub>2</sub>SO<sub>4</sub>, NaHSO<sub>3</sub>, &amp; NaOH &amp; polyelectrolyte</li> </ul> <p>b. Non-metal-containing wastewater</p> <ul style="list-style-type: none"> <li>Initial transfer tank &amp; transfer pumps</li> <li>Incoming Balance tank &amp; transfer pumps</li> <li>pH correction system</li> <li>Discharge pH, Temperature &amp; Flow monitoring</li> </ul>	6 - 28m <sup>3</sup> /h
GE Aviation Hamble, UK	<p><b>Treatment of wastewater from metal finishing</b></p> <p>Replacement of plant supplied previously in 1994 due to factory expansion</p> <p>Automatic transfer systems in various remote production shops, including inter-connecting dual containment pipework and remote status communication, inter-locking &amp; alarms</p> <p>Incoming Balance tank for Chrome-containing wastewater &amp; transfer pumps</p> <p>Chromium reduction, pH correction, separate pH correction for Tartaric acid, Flocculation</p> <p>Lamella tube Settler.</p> <p>Sludge collection and filter press</p> <p>Automatic pH probe cleaning system</p> <p>Discharge pH, Turbidity &amp; Flow monitoring</p> <p>Dual-IBC-based dosing systems for H<sub>2</sub>SO<sub>4</sub>, NaHSO<sub>3</sub>, &amp; NaOH, with auto-changeover</p> <p>Separate dosing systems for Ca(OH)<sub>2</sub> &amp; polyelectrolyte</p> <p>Alarm transmission to Security and various personnel, via both text and email.</p>	20m <sup>3</sup> /h
Chromalloy, Somercotes, UK	<p><b>Treatment of wastewater from metal finishing,</b> including component stripping and platinum plating. Includes both rinse water and spent process solutions</p> <p>Ammonia treatment, pH correction, Flocculation.</p> <p>Lamella tube Settler.</p> <p>Alkali dumps tank &amp; bleed system</p> <p>Sludge collection and filter press</p> <p>Discharge Flow monitoring</p>	5m <sup>3</sup> /h
Herr Voss, for Egypt	<p><b>Water and wastewater treatment for cleaning of aluminium strip</b></p> <p>Largely pre-assembled and tested plant, comprising:</p> <p><b>Deionised Water supply system</b></p> <p>Activated Carbon Softener / Reverse Osmosis and mixed bed polishing system</p> <p><b>Wastewater Treatment Plant</b></p> <p>Acidification &amp; Oil flotation</p> <p>pH correction, Flocculation, Lamella Tube Settler</p> <p>Sludge collection and filter press</p> <p>Discharge Flow monitoring</p>	4m <sup>3</sup> /h  2.5m <sup>3</sup> /h

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Gestamp Tallent Cannock, UK	<b>Treatment of wastewater from metal finishing</b> pH correction, flocculation, Lamella Tube Settler Alkali dumps tank & bleed system Sludge collection and filter press IBC-based dosing systems for H <sub>2</sub> SO <sub>4</sub> and NaOH Emulsion –based dilution and dosing system for polymer	10 m <sup>3</sup> /h
	<b>Deionised Water supply system</b> Softener / Reverse Osmosis system	4.8 m <sup>3</sup> /h
	<b>Interconnecting pipework</b> Between process (cleaning and paint) line and wastewater treatment plant. Includes both single and dual containment systems for wastewater and production chemicals etc.	
GE Aerospace Hamble, UK	<b>Treatment of wastewater from metal finishing</b> Extension of existing plant (from 1994) for treatment of tartaric acid from anodising	5 m <sup>3</sup> /h
Ray Owen Plating Telford, UK	<b>Special Ion Exchange system for removal of Iron &amp; Zinc contaminants from Trivalent Chromium Passivate solution</b> Skid-mounted system including Backwash liquor make-up & recovery & Regeneration system	3 m <sup>3</sup> /h
Otelinox Targoviste, Romania	<b>Bulk chemical storage and dosing systems for 70% HF and 60% HNO<sub>3</sub></b>	
Jaguar Cars Ltd, Halewood, UK	<b>Rinse Water and Process Dumps collection systems for Acid, Alkali and Paint wastes.</b> Paint coagulation, Neutralisation, Flocculation,, two lamella tube settlers, Final discharge monitoring Sludge thickener, sludge filter press & filtrate recycling Bulk chemical storage & dosing for FeCl <sub>3</sub> , HCl & NaOH, incl. HCl scrubber. Additional dosing systems for polyelectrolyte & antifoam Floor spillage systems Full integrated control system with SCADA	(3 x 150m <sup>3</sup> and 3 x 120m <sup>3</sup> ) ≤75m <sup>3</sup> /h
ProWaTech AG Embrach, Switzerland	<b>Treatment of wastewater from electroplating</b>	
	Ion exchanger Ion exchanger	3 m <sup>3</sup> /h 6 m <sup>3</sup> /h
Ruag Biel, Switzerland	<b>Treatment of wastewater from electroplating</b>  Selective exchanger	10 m <sup>3</sup> /h
Wieland Metals Singapore Singapore	<b>Treatment of wastewater from electroplating</b>	
	Selective exchanger	9 m <sup>3</sup> /h
	Ion exchanger single line	46 m <sup>3</sup> /h
	Batch neutralisation plants	5 m <sup>3</sup> /h
	Filter unit	6 m <sup>3</sup> /h
Schweizer Electronic AG Schramberg, Germany	<b>Treatment of wastewater from electroplating</b>  Selective exchanger	10 m <sup>3</sup> /h

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EPCOS S.A. Evora, Portugal	<b>Treatment of wastewater from electroplating</b>  Ion exchanger single line	16 m <sup>3</sup> /h
Jansen AG Oberriet, Switzerland	<b>Treatment of wastewater from electroplating</b>  Ion exchanger Optimisation of the existing wastewater treatment plant	16 m <sup>3</sup> /h
ProWaTech AG Embrach, Switzerland	<b>Treatment of wastewater from electroplating</b>  Multi-media filter Ion exchanger	6 m <sup>3</sup> /h
Feller Horgen, Switzerland through Wistag	<b>Treatment of wastewater from electroplating</b>  Re-circulation ion exchanger	4,5 m <sup>3</sup> /h
Daimler Chrysler AG Sindelfingen, Germany	<b>Treatment of wastewater from electroplating</b>  Selective exchanger	80 m <sup>3</sup> /h
TRW Gelsenkirchen, Germany	<b>Treatment of wastewater from electroplating</b>  Selective exchanger	6 m <sup>3</sup> /h
Faude Gippingen, Switzerland	<b>Treatment of wastewater from electroplating</b>  Re-circulation ion exchanger	4,5 m <sup>3</sup> /h
Stihl Wil, Switzerland	<b>Treatment of wastewater from electro plating</b>  Demineralisation plant Continuous neutralisation Batch neutralisation plants Sludge treatment Chemical supply	4,5 m <sup>3</sup> /h 15 m <sup>3</sup> /h 7 m <sup>3</sup> /h
Ruwel Geldern, Germany	<b>Treatment of wastewater from PCB production:</b>  Softening and reverse osmosis NOVALIS Batch treatment Persulphate treatment Chemical supply and disposal for the entire factory Selective exchanger	13/3 m <sup>3</sup> /h 12 m <sup>3</sup> /h 1.8 m <sup>3</sup> /h max. 30 m <sup>3</sup> /h
Rotra Technoboards GmbH Kronach, Germany	<b>Treatment of wastewater from PCB production:</b>  Re-circulation ion exchanger, desalination cartridge MPA Two separate multimedia filters	12 m <sup>3</sup> /h 5 and 10 m <sup>3</sup> /h
PPC Cham, Switzerland  through Wistag AG Flaach/Switzerland	<b>Treatment of process and wastewater from PCB production:</b>  Demineralisation plant Softener Re-circulation ion exchanger Three batch neutralisation plants Continuous neutralisation Sludge treatment	6 m <sup>3</sup> /h 15 m <sup>3</sup> /h 20 m <sup>3</sup> /h 4 m <sup>3</sup> /each 15 m <sup>3</sup> /h
Gould Electronics Eichstetten, Germany	<b>Rinse water treatment</b>  Re-circulation ion exchanger	40 m <sup>3</sup> /h

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De Martin Waengi, Switzerland	<b>Treatment of wastewater from electroplating</b> Re-circulation ion exchanger	17 m <sup>3</sup> /h
Huber + Suhner Herisau, Switzerland	<b>Treatment of wastewater from electroplating</b> Re-circulation ion exchanger	17 m <sup>3</sup> /h
Outokumpu Stainless Sheffield, UK	<b>Treatment of Wastewater from Stainless steel pickling</b> Automatic chemical dosing for pickling tanks Chemical bulk storage systems Fume extraction & Scrubbing Partial water recycling	50 m <sup>3</sup> /h
Siemens Matsushita Deutschlandsberg, Austria	<b>Treatment of wastewater from electroplating</b> Sedimentation Evaporation	4 m <sup>3</sup> /h 100 l/h
Ruwel Geldern, Germany	<b>Treatment of wastewater from PCB production:</b> Batch treatment Resist treatment Re-circulation ion exchanger Selective ion exchanger	10 m <sup>3</sup> /h 1.5 m <sup>3</sup> /h 17 m <sup>3</sup> /h 20 m <sup>3</sup> /h
GfE Umwelttechnik Nürnberg, Germany	<b>Treatment of wastewater from electroplating</b> Ion exchanger for the recovery of vanadium	12 m <sup>3</sup> /h
Steiger Vevey, Switzerland	<b>Treatment of wastewater from electroplating</b> Re-circulation ion exchanger Batch treatment of Cr-containing wastewater Batch treatment of Ni-containing wastewater Sedimentation Chamber filter press Final filter Continuous neutralisation of solutions free from metals Final filtration	16 m <sup>3</sup> /h 15 m <sup>3</sup> 15 m <sup>3</sup>    5 m <sup>3</sup> /h 10 m <sup>3</sup> /h
KM Europa Metall Berlin, Germany	<b>Treatment of wastewater from electroplating</b> Reconstruction of a batch neutralisation plant for fluoride-containing wastewater Modernisation of the control system Batch neutralisation Sludge treatment	2 x 5 m <sup>3</sup> /h
Jansen Oberriet, Switzerland	<b>Treatment of washing water:</b> Batch treatment of washing water resulting from degreasing and KMnO <sub>4</sub> baths	15 m <sup>3</sup> /h
Jean Müller Eltville, Germany	<b>Treatment of wastewater from electroplating (extension of an existing wastewater treatment plant):</b> Re-circulation ion exchanger Batch treatment Special treatment of degreasing baths	4 m <sup>3</sup> /h 3 m <sup>3</sup> /h

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Jansen Dingelstaedt, Germany	<b>Treatment of wastewater from electroplating</b>  Re-circulation ion exchanger Batch treatment of wastewater resulting from phosphate pickling as well as of oil-containing wastewater Sedimentation Chamber filter press Final filtration Chemical storage and supply	12 m <sup>3</sup> /h 1.25 m <sup>3</sup> /h
Estoppey Aegerten-Bien, Germany	<b>Treatment of wastewater from electroplating</b>  Re-circulation ion exchanger Chemical storage and dosing station	20 m <sup>3</sup> /h
Euramax Ltd. Corby, UK	<b>Treatment of wastewater from aluminium coil processing</b>  Acidification & oil flotation Chromium reduction, pH neutralisation & flocculation Settlement, sludge storage and dewatering Final sand filtration and discharge monitoring Chemical storage & dosing systems	10 m <sup>3</sup> /h
TRW Fahrzeugsysteme GmbH & Co. KG Gelsenkirchen, Germany	<b>Treatment of wastewater from production of chassis components:</b>  Ultrafiltration for treating oil-containing wastewater Batch treatment of wastewater resulting from phosphate pickling Batch treatment of wastewater resulting from varnishing adsorption Two ultrafiltration plants (ceramics) for extending the service time Final filtration	600 l/h 20 m <sup>3</sup> /h 3 m <sup>3</sup> /h 120 l/h 4.5 m <sup>3</sup> /h
Grob + Co. AG Horgen, Switzerland	<b>Treatment of wastewater from aircraft component production:</b>  Re-circulation ion exchanger Two batch treatment plants Continuous neutralisation Chemical storage and supply	18 m <sup>3</sup> /h 6/10 m <sup>3</sup>
Rimmel GmbH Kempten, Germany	<b>Treatment of wastewater from electroplating</b>  Re-circulation ion exchanger Batch treatment of cyanide-containing wastewater Batch treatment of chromate-containing wastewater Chamber filter press Final filtration Chemical storage and supply Carbonate freezing to extend the service time Demineralisation plant	5 m <sup>3</sup> /h 9 m <sup>3</sup> 9 m <sup>3</sup> 5 m <sup>3</sup> /h 4 m <sup>3</sup> /h
GE Aviation, Aerostructures Hamble, UK	Effluent Treatment Plant for metal finishing departments including chromium reduction, neutralisation, flocculation, settlement, sludge collection & dewatering, final continuous gravity sand filter, associated chemical dosing systems system upgrade	16 m <sup>3</sup> /h

Client	Plant Type	Capacity
Huber + Suhner AG Herisau, Switzerland	<b>Treatment of wastewater from precious metal electroplating</b>  Re-circulation ion exchanger SERVO-Cleanflow	17 m <sup>3</sup> /h
TRW Fahrzeugsysteme GmbH & Co. KG Krefeld, Germany	<b>Treatment of wastewater from production of chassis components:</b>  Ultrafiltration for treating oil-containing wastewater Batch treatment of wastewater resulting from phosphate pickling Final filtration	200 l/h 20 m <sup>3</sup> /h 4.5 m <sup>3</sup> /h
Brenntag Düren, Germany	<b>Treatment of wastewater from cleaning of tank truck containers of a chemical wholesale supplier:</b>  Batch treatment Sedimentation Sludge filtration Final filtration Gasoline separation  <b>Particularities:</b> H <sub>2</sub> O <sub>2</sub> treatment Low upgrading in the wastewater TDS	10 m <sup>3</sup> /batch
UWE Sondermüll & Recycling GmbH Taucha, Germany	<b>Treatment systems for</b> - <b>wastewater from facilities which have been shut down</b> - <b>wastewater from electroplating shops (centralised treatment)</b> - <b>thin sludge and other liquid media without organic load</b>  Anodic cyanide oxidation via electrolysis and subsequent H <sub>2</sub> O <sub>2</sub> /Caroat detoxification Chromate detoxification Continuous neutralisation Sedimentation Selective ion exchanger	8 m <sup>3</sup> /h 8 m <sup>3</sup> /h 16 m <sup>3</sup> /h 4 m <sup>3</sup> /h
Festo KG Pneumatic Esslingen, Germany	<b>Treatment of wastewater from electrolytic oxidation</b>  Re-circulation ion exchanger Activated carbon filter Batch treatment Chamber filter press Selective ion exchanger Chemical storage and supply	2 m <sup>3</sup> /h 3 m <sup>3</sup> /h 1 m <sup>3</sup> /h
Texas Instruments GmbH Freising, Germany	<b>Treatment of wastewater containing phosphate:</b>  Reverse osmosis plant for the removal of phosphate and fluoride from washing water (98 % phosphate removal)	2 m <sup>3</sup> /h
De Martin AG Wängi, Switzerland	<b>Treatment of wastewater from electroplating</b>  Re-circulation ion exchanger	15 m <sup>3</sup> /h
Hippold Metallwaren GmbH Kraftsried, Germany	<b>Treatment of wastewater from electroplating</b>  Re-circulation ion exchanger	5 m <sup>3</sup> /h

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Brenntag Nürnberg, Germany	<b>Treatment of wastewater from cleaning of tank truck containers of a chemical wholesale supplier:</b>  Batch treatment Sedimentation Sludge filtration Final filtration Gasoline separation	10 m <sup>3</sup> /batch
Opel Hungary  through Air Industries Stuttgart, Germany	<b>Treatment of wastewater from varnishing:</b>  Continuous neutralisation of nitrate-containing wastewater Continuous neutralisation of chromate-containing wastewater Two-stage continuous neutralisation with lamellar clarifier Sludge dehydration, Selective ion exchanger Lacquer coagulation	10 m <sup>3</sup> /h
DEGUSSA AG Schwäbisch Gmünd, Germany	<b>Treatment of wastewater from electroplating pilot plant:</b>  Re-circulation ion exchanger SERVO-Cleanflow Treatment of a partial stream via mixed bed and tenside exchanger Re-circulation ion exchanger SERVO-Cleanflow Recovery of metals and preliminary cyanide oxidation via electrolysis cells Batch treatment (cyanide oxidation with H <sub>2</sub> O <sub>2</sub> /Caroat), batch treatment of partial streams containing sequestrants Selective anion exchanger Chemical storage and supply station	30 m <sup>3</sup> /h 8 m <sup>3</sup> /h 15 m <sup>3</sup> /h 8 m <sup>3</sup> /h
Straumann SA Mezzovico, Switzerland	<b>Treatment of wastewater from electropolishing and vibratory grinding:</b>  Two batch treatment systems Sludge thickening Continuous neutralisation Upgrading of emulsions via ultrafiltration, incl. oil removal and fine filtration	7 m <sup>3</sup> /h each 120 l/h
Landis und Gyr AG Zug, Switzerland	<b>Treatment of wastewater from a special electroplating shop:</b>  Re-circulation ion exchanger	5 m <sup>3</sup> /h
Mega Gossau AG Gossau, Switzerland	<b>Treatment of wastewater from electroplating</b>  Re-circulation ion exchanger SERVO-Cleanflow, Batch treatment Selective ion exchanger	20 m <sup>3</sup> /h
Spinner GmbH München, Germany	<b>Treatment of wastewater from electroplating</b>  Re-circulation ion exchanger SERVO-Cleanflow Re-circulation ion exchanger SERVO-Cleanflow Batch treatment of chromate-containing wastewater Batch treatment of cyanide-containing wastewater Sludge dehydration Selective ion exchanger	20 m <sup>3</sup> /h 5 m <sup>3</sup> /h 1.5 m <sup>3</sup> /h
Ruwel-Werke GmbH Geldern, Germany	<b>Treatment of wastewater from PCB production:</b>  Batch treatment Batch treatment of wastewater resulting from photoresist 2 separate sludge disposal systems Final filtration, chemical storage and supply station	5 m <sup>3</sup> /h 10 m <sup>3</sup> /h



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Verzinkerei Oberuzwil AG Oberuzwil, Switzerland	<b>Treatment of wastewater from chrome steel pickling:</b>	
	Re-circulation ion exchanger	8 m <sup>3</sup> /h
	Precipitation of fluoride Continuous neutralisation	3 m <sup>3</sup> /h
Bodenschatz AG Allschwil, Switzerland	<b>Treatment of wastewater from two separate automatic zinc and chromium pickling baths:</b>	
	Re-circulation ion exchanger for acidic and chromic acid-containing wastewater	15 m <sup>3</sup> /h
	Re-circulation ion exchanger for alkaline cyanide-containing wastewater	15 m <sup>3</sup> /h
Brenntag Heilbronn, Germany	<b>Treatment of wastewater from the cleaning of tank truck containers of a chemical wholesale supplier:</b>	
	Batch detoxification Sedimentation Sludge filtration Final filtration Gasoline separation	10 m <sup>3</sup>
	<b>Particularities:</b> H <sub>2</sub> O <sub>2</sub> treatment Low upgrading in the wastewater salt content	
Zbinden PCB AG Welscherrohr, Switzerland	<b>Treatment of wastewater from PCB production:</b>	
	Re-circulation ion exchanger SERVO-Cleanflow	20 m <sup>3</sup> /h
	2 batch treatment plants	8/5 m <sup>3</sup>
	Softening plant Deminalisation plant	15 m <sup>3</sup> /h 4 m <sup>3</sup> /h
J. Hofstetter Lackierwerk Küssnacht, Rigi, Switzerland	<b>Treatment of wastewater from a pre-treatment plant:</b>	
	Re-circulation ion exchanger	8 m <sup>3</sup> /h
	Batch treatment of chromium-containing concentrates Continuous neutralisation	8 m <sup>3</sup> /batch 3 m <sup>3</sup> /h
Interrecycling AG Küssnacht, Rigi, Switzerland	<b>Treatment of wastewater from electrolytic copper recovery</b>	
	Re-circulation ion exchanger SERVO-Cleanflow	12 m <sup>3</sup> /h
Verzinkerei Pratteln AG Pratteln, Switzerland	<b>Treatment of wastewater from an electroplating shop for plastics:</b>	
	Re-circulation ion exchanger SERVO-Cleanflow	15 m <sup>3</sup> /h
	Batch treatment of regenerates and concentrates	10 m <sup>3</sup> /charge
	Selective ion exchanger Deminalisation plant	3 m <sup>3</sup> /h 2.5 m <sup>3</sup> /h
Grohe Thermostat GmbH Lahr, Germany	<b>Treatment of wastewater from the production of fittings:</b>	
	Re-circulation ion exchanger SERVO-Cleanflow for treating wastewater containing nickel,	30 m <sup>3</sup> /h
	Re-circulation ion exchanger SERVO-Cleanflow for treating wastewater containing cyanide,	30 m <sup>3</sup> /h
	Batch treatment of regenerates and concentrates	3 m <sup>3</sup> /h
	Special treatment for removal of metals, Selective ion exchanger	10 m <sup>3</sup> /h
	Deminalisation plant and mixed bed exchanger	3 m <sup>3</sup> /h

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Gould Metall GmbH Eichstetten, Germany	<b>Treatment of wastewater resulting from production of copper foils:</b>  Re-circulation ion exchanger	60 m <sup>3</sup> /h
Robert Bosch GmbH Stuttgart, Germany	<b>Treatment of wastewater from electroplating:</b>  Re-circulation ion exchanger SERVO-Cleanflow	60 m <sup>3</sup> /h
Markus Hofstetter AG Küssnacht, Switzerland	<b>Treatment of wastewater from semiconductor production:</b>  Re-circulation ion exchanger SERVO-Cleanflow Batch treatment of regenerates and concentrates Demineralisation plant	35 m <sup>3</sup> /h 7 m <sup>3</sup> 2.5 m <sup>3</sup> /h
IBM Deutschland GmbH Böblingen, Germany	<b>Treatment of wastewater from semiconductor production:</b>  Batch treatment Sedimentation Sludge filtration  <b>Particularities::</b> Metex disposal, organic lead and cadmium complexes	18 m <sup>3</sup> /h

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