



Sidentop: innovative and practical

Pickling: on a toll basis or in your own works?

High costs. Strict conditions in accordance with German emission laws (Bundes-Immission-Schutz-Gesetz (BImSchG)). Technically demanding work processes. Good reasons to outsource pickling of stainless steel - toll pickling has become established as an alternative for this material. An in-house pickling plant is in many cases a thing of the past. But the trend is changing.

But as is often the case, there is another side to the coin. And toll pickling does have its downsides:

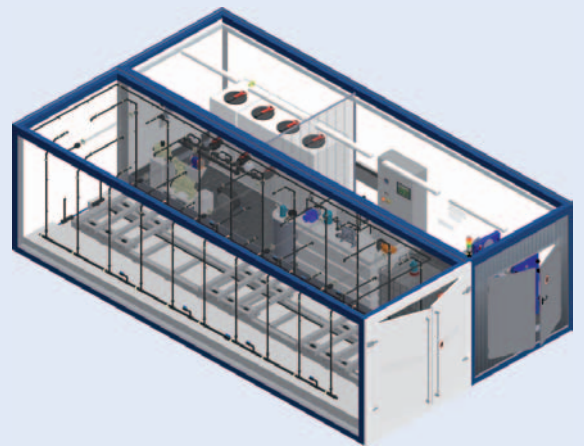
- Longer production times due to transport requirements and the need for coordination with outside pickling companies
- Possible damage to products during transport which can cost time and money
- The quality of the pickling cannot be controlled
- Any disruption to the cooperation with the outside pickling company often has a negative impact on internal processes





When looking from the perspective of cost and process optimisation, good advice is expensive - or rather, in the truest sense "value for money".

The Braunschweig based company Siedentop has developed technical solutions that



are innovative and practical all along the line. "When developing our pickling plants, the automation of the various processes and the reduction of chemicals used during the pickling process were our focal points. As it proved to be, a profitable idea from both an ecological and economic point of view: because, as a result of this, our fully automated Rotainer® pickling plants do not require a permit and are not subject to German emission laws (BImSchG). A tangible benefit for



companies which process stainless steel and have a regular requirement for pickling. Nowadays, we install our plants all over Europe,” says Siedentop managing director Friedrich-Werner Siedentop.

Pickling “back to the roots” and yet innovative!?! Exactly. Stainless steel can be pick-

pickling plants available, companies can select the size and features of the plant in accordance with their specific requirements.

- Repeated costs for toll pickling are avoided - the purchase of one's own Rotainer® pickling plant has on average paid for itself within two years.

Against the background of social responsibility also, in-house pickling with Siedentop plants is another plus point. The absence of any contact with acid means a healthy work environment for employees. The rotation



Stainless steel surface before (above) and after (right) Rotainer® pickling

led by one's own company both process and cost optimised with these plants.

The advantages of the Siedentop fully automated Rotainer® pickling plants in detail:

- The various processing steps such as degreasing, pickling, passivating and rinsing run automatically - as a result employees no longer come into contact with the pickling acid.
- An automatic air rinsing process after pickling means that Rotainer® pickling plants are emission free.
- For a pickling plant with a recirculating spray system there is no need for a pickling tank; consumption of the pickling agent is low, and therefore only a small reservoir is required for pickling acid - that also means no permit is needed in order to comply with the German emission laws (BImSchG).
- The process and the pickling quality can be optimally controlled in-house.
- Because of the range of Rotainer®

spray pickling process, as well as the low pickling acid volumes compared to immersion pickling, considerably reduces the risk of a chemical accident. This, and the low consumption of pickling acid, contributes in a sustainable manner to companies' endeavours to use resources efficiently and without harming the environment.

Responsible pickling: emission free and with 90% water recycling

Rotainer® pickling plants from Siedentop GmbH pickle, unlike traditional immersion pickling, with no emissions and no waste water - and the quality is the same.

How can that work? Acid is acid. Siedentop plants pickle in a closed system with a fully automatic circulating spray process. This requires a maximum of 900 litres of pickling acid and does not therefore require a permit to comply with BImSchG. A several thousand litre immersion tank is consequently not required. An enormous ecological ad-

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Example: Estimated emissions of traditional pickling tanks in Germany

Number of immersion tanks in the whole of Germany	HF emissions		NOX emissions	
	per hour	per year	per hour	per year
5,000***	150kg	1,315t	250kg	2,192t

*** assumed number

vantage. Because the emissions from a traditional immersion tank are considerable:

An example: emissions from a traditional pickling tank per m³ over an hour

Average tank size:	5m x 2m
Surface area of pickling tank:	10m ²
Air filtration requirement per hour:	10,000m ³
Hydrofluoric acid discharge (HF) per hour*	30g/m ³
Discharge of nitrogen oxides (NOX) per hour**	50g/m ³

* max. limit 3mg/m³ (TA Luft)

** max. limit 5mg/m³ (TA Luft)

If these emissions are extrapolated per annum with an estimated number of immersion tanks in the whole of Germany, one quickly gets to several thousand tonnes of pollution emitted into the atmosphere by these pickling processes.

There is another way. With Rotainer[®] pickling plants these emission levels, both for hydrofluoric acid and nitrogen oxides, are zero.

The reasons for this are the following: Rotainer[®] plants use sulphuric acid rather than nitric acid. Nitric acid free pickling with TOP-Acid pickling acid from Siedentop has several advantages. After the pickling process, the air can be quite simply rinsed with water and so be "washed, emission free" (an exhaust air scrubber is not required). This rinsing water is then neutralised with sodium hydroxide. The filter cake which results is relatively small due to the small quantity of neutralising agent - hazardous waste and disposal costs are reduced by up to 70% as a result. The filtered rinsing water is then fully demineralised in a vacuum distillation plant, and can be used again for subsequent rinsing operations. Water recovery is as a result over 90%. Another advantage: nitric acid free pickling avoids the deposition of crystalline metal salts, and consequently there is no need to replace the pickling acid. This means that reuse of the pickling acid is almost unlimited.

Rotainer[®] pickling plants from Siedentop GmbH set new standards when it comes to ecologically and also economically optimised

processes. Particularly against the background of political and social discussions about pollution and the urgent need to reduce emission levels, stainless steel processing companies using Rotainer[®] plants are at the cutting edge. Sustainable. Progressive. Responsible.

A comparison of pickling processes

Five metre Rotainer[®] pickling plant

No emissions
No discharge of HF
No discharge of NOX
90% water recovery
900 litres of pickling acid
No permit required to meet German emission laws (BlmSchG)
Employees have no contact with acid

Five metre immersion tank

10,000m³ per hour
HF 3mg/m³ = 263kg/year
NOX 5mg/m³ = 438kg/year
No recovery of water possible
20,000 litres of pickling acid
Permit according to BlmSchG required
Employees work at an open, fume emitting pickling acid tank