

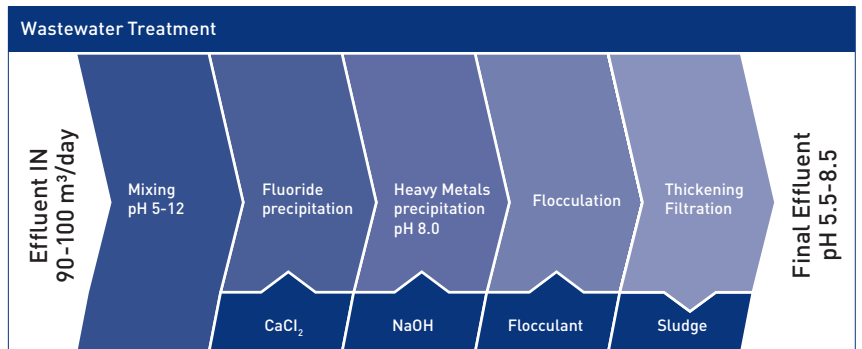


## Case study Neutralac® SLS45

# Heavy metal and fluoride removal from wastewater in the metal plating industry

### Customer Application and Activity

A leading global automotive supplier in France, uses the Henkel process to endow the different components in its heating, ventilation and air-conditioning systems with anticorrosion and hydrophobic properties.



### Problem to be solved

The wastewater generated by this operation contains heavy metals and fluoride. The plant used a combination of NaOH for the neutralization and CaCl<sub>2</sub> for the precipitation of fluoride and heavy metals to treat the effluents before discharging them into the river. The resulting CaF<sub>2</sub> and metal hydroxides were then removed by flocculation and filtration. However, this did not always prove effective in meeting the maximum fluoride concentration (15 mg/l) imposed by the local authorities.

The method of adding CaCl<sub>2</sub> and NaOH turned out to be ineffective for removing the fluoride and meeting the French Government Standard: < 15 mg/l, preferably < 13 mg/l

		Before Treatment	After Treatment CaCl <sub>2</sub> + NaOH	Local Authority Regulation 27-08-08
COD	mg/l	18	15	< 100
TSS	mg/l	175	3	< 30
Cr <sup>6+</sup>	mg/l	0.1-1.3	0.01-0.02	< 0.1
Cr total	mg/l	0.05-1.4	0.01-0.04	< 0.2
Sulfate	mg/l	14-160	1-3	< 30
Chloride	mg/l	1600-1800	1800-2000	< 1000
Fluoride	mg/l	100-200	> 20	< 15

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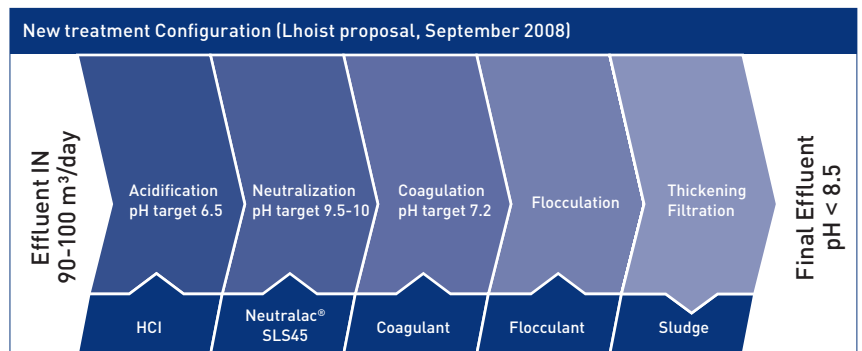


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### Neutralac® SLS45 Solution

Lhoist offered a new method for treating the wastewater:

1. Getting the pH at the entry of the process to a value of 6.5 and maintaining it at that level instead of having the former fluctuations which ranged between 5 and 12.
2. Increasing the pH during the treatment phase from 8.0 to 9.5 for a better precipitation of the fluoride
3. Simplifying the process by using a single reagent instead of a combination of NaOH and CaCl<sub>2</sub>



Results of the comparative test conducted in the new treatment configuration

Alkali		Coagulant		Chloride	Fluoride	Filtration
	Dose per m <sup>3</sup> effluent		Dose per m <sup>3</sup> effluent	mg/l	mg/l	Sludge amount per m <sup>3</sup> effluent
CaCl <sub>2</sub> dry NaOH 30%	0.51 kg 1.9 kg	Coagulant 1	1.93 l	1800	30	3 kg
Neutralac® SLS45	3.38 kg	Coagulant 1	1.40 l	1500	10-11	5-6 kg
Neutralac® SLS45	3.38 kg	Coagulant 2	1.20 l	1500	10-11	5-6 kg

### Conclusions

The user noted an improved and more constant fluoride removal performance when using Neutralac® SLS45. The calcium hydroxide flocs absorbed most of the fluoride present in the effluents. The volume of sludge produced could be optimized by using different flocculants. Neutralac® SLS45 was recognized as the most efficient solution for meeting the 15 mg/l fluoride limit imposed by the local authorities.



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