CASE HISTORY 30 — NUPAC®

70% Capacity Increase in Chlorine Stripper

Chemical plant avoids $150,000 column replacement; polyethylene NUPAC retrofit delivers 70% capacity increase against a 50% target.

APPLICATION

Cl_2 stripping from HCl, chemical plant

PREVIOUS PACKING

2″ plastic Pall rings

PRESSURE DROP

15″ → 9″ WC at full capacity

◆ THE PROBLEM

A chemical plant in Southern Louisiana manufacturing 100,000 tons per day of herbicide was faced with a potentially costly dilemma. They needed to expand output by 30%, but its chlorine stripper was already at maximum capacity. Operating at 50 gpm, the stripper — an 18″ diameter column with 28.5 ft of packing — needed to handle at least 75 gpm, a 50% capacity increase. This required packing with substantially lower pressure drop to allow the increased flow, as well as improved transfer efficiency to meet effluent specifications at the higher rate.

The stripper performs the function of stripping elemental chlorine (Cl_2) from hydrochloric acid (HCl). The Cl_2 environment had been reducing packing service life to only 2 years, forcing frequent costly shutdowns. The replacement packing had to be made from an affordably priced material capable of resisting chlorine attack.

> *NUPAC in polyethylene reduced pressure drop from 15″ to 9″ WC and increased capacity by 70% — 20% beyond what was required — while also improving transfer efficiency. In the plant's own words: "This will allow us much more flexibility and the possibility of saving costs by shutting down the other stripper. The new packing does all LANTEC said it would for performance."*

◆ WHY NUPAC WAS SELECTED

The alternatives were to purchase a new stripper at a cost of $150,000 or to retrofit the existing equipment with #2 NUPAC. The retrofit promised the desired capacity increase, better transfer efficiency, and significantly lower capital cost. NUPAC could also be supplied in polyethylene — a material that provides the corrosion resistance required in a chlorine environment.

PRODUCT

NUPAC

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CAPACITY INCREASE

+70%

Design target was 50% — NUPAC exceeded it by 20%. Capacity grew from 50 gpm to 85 gpm

PRESSURE DROP COMPARISON

Pall rings vs. NUPAC at operating conditions

15″	9″
WC · Pall rings	WC · NUPAC

APPLICATION CONTEXT

Cl_2 stripping · HCl service · Chlorine resistance · Capacity increase · Chemical plant

◆ MEETING THE REQUIREMENTS

In February 1999, the 28.5 ft bed of 2″ plastic Pall rings was replaced with polyethylene #2 NUPAC. Pressure drop was reduced from 15″ WC to 9″ WC. Measured capacity increased by 70% — exceeding the 50% design target by 20%. Transfer efficiency also increased; even at the higher throughput, efficiency was 10% higher than before.

In the plant's own words: *"We now operate with flows up to 85 gpm. This will allow us much more flexibility and the possibility of saving costs by shutting down the other stripper. The new packing does all LANTEC said it would for performance."*

NOTE

NUPAC supplied in polyethylene for chlorine service compatibility. Alternative new column cost: $150,000.