

**PROJECT REPORT (PR-014)****N-REMOVAL WITH AMT'S ADE PINNACLE PERFORMANCE TRAYS**

Customer: Major Energy Corporation in USA

Project: N-Compound Removal from Iso-octene
C4 Feed Stream

Date of Revamp: June, 2004

BACKGROUND

Part of the modification in converting an MTBE unit to an Iso-octene unit required the C4 stream to have as low nitrile content as possible. This was because the Iso-octene catalyst is more sensitive to the nitriles than the MTBE catalyst. The existing Water Wash Column at the Client's Oil Refinery was not removing targeted N-compounds (mostly -acetonitrile, ACN) from the C4 Feed and was hydraulically limited. The Refinery wish to improve the performance of the subject Water Wash Liquid/Liquid Extraction Column. One part of the solution is to maximize the theoretical stages as part of an overall plan to improve extraction efficiency. AMT proposed revamping the column with AMT's field-proven ADE Pinnacle Performance Extraction trays.

REVAMP OBJECTIVES

The objectives of this revamp were:

1. Increase column throughput by >15% while keeping the water to feed ratio at <0.2.
2. Substantially improve the N-compounds removal efficiency.

COLUMN PERFORMANCEBefore Revamp

The existing Water Wash Column was packed with 4 sections of random packing. Before the revamp, at the given feed rate and water/feed ratio, the existing Water Wash Column was only able to reduce the N-compounds, particularly the ACN compound in the Feed from 2~5ppm to 1~2 ppm.

After Revamp

To meet all the revamp objectives, AMT proposed to replace all of the existing packing sections with AMT's field-proven, high performance ADE Liquid/Liquid Extraction Trays for this service.

After the revamp with ADE Trays, The Refinery was able to substantially improve the Water Wash Column extraction efficiency and reduce the Acetonitrile in the C4 raffinate to <0.3 ppm ACN with the same water/feed ratio. In addition, the Column has achieved and exceeded the required capacity increase.

Performance Comparison

	<u>Before</u>	<u>After</u>
Column Diameter	5'-0"	5'-0"
Type of Internals	Packing	ADE Tray
Charge Rate	100%	>115%
Total ACN in Feed,	2~5 ppm	2~5 ppm
ACN in C4 Raffinate,	1~2 ppm	<0.3 ppm

