



A Siemens Business

ANALYTICAL LABORATORY  
4669 SHEPHERD TRAIL  
ROCKFORD, IL 61103-1294

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### CERTIFICATE OF ANALYSIS

Analysis NO : 45626  
Job ID : J[2005DEC27]3060

Branch Org. Code :  
SO Number

Customer PO No. :  
Sampled : 10/24/2005  
Received : 12/27/2005  
Completed : 01/04/2006  
Purpose : Purchase Order  
Supply/Source :  
Sample Point : Column 14  
Resin ID : A-674  
Description : Mixed Bed Anion

ATTN:

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#### TOTAL and/or SALT SPLITTING CAPACITY ANALYSIS

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	As Received	% Change From New	After Cleanup	% Change From New	New Resin Avg. Values
Total Capacity (meq/mL, (Cl) )	0.98	11.16	1.00	9.03	1.10
Salt Split Capacity (meq/mL, (Cl) )	0.83	24.89	0.84	23.27	1.10

The total capacity of this resin has decreased a moderate amount. A cleanup of the resin was unsuccessful in restoring a significant amount of the lost capacity. A capacity loss of this magnitude may result in shorter unit operating cycles.

The salt splitting capacity of a strong base anion resin is a measure of its ability to remove weak acids such as silicic and carbonic. The salt splitting capacity of this resin has decreased a substantial amount. A cleanup of the resin was unsuccessful in restoring a significant amount of the lost capacity. A capacity loss of this magnitude will probably result in shorter unit operating cycles or premature breakthrough of silica or CO2. If unit operation is unacceptable, resin replacement may be necessary.

The difference in the salt splitting to total capacity of this resin is moderate. Although the ratio is moderate, there may still be a substantial loss of salt splitting and/or total capacity due to other factors such as resin fouling. A ratio of the salt splitting (strong base active sites) to total capacity (strong base plus weak base active sites) indicates the degree of degradation of the strong base sites to weak base sites. This continual degradation is normal as the resin ages; however, accelerated changes in this ratio may point to supplemental causes such as operation of the resin at elevated temperature. Where a cleanup of the resin is shown, this ratio is based on the cleanup capacities.

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#### MOISTURE ANALYSIS

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	As Received	% Change From New	New Resin Avg. Values
(% , (Cl) )	57.34	10.27	52.00

The moisture content of this resin has increased to a point which indicates that a moderate amount of oxidation has occurred. As a resin increasingly oxidizes it swells to a greater volume and becomes structurally weaker. In the case of a cation resin in a softener application, this is not too serious; however, for two bed deionizer applications, the byproducts of cation resin oxidation may irreversibly foul the anion exchange resin. In a mixed bed, the resin interface may be adversely affected. Resin oxidation may also result in the loss of resin on backwash and production of resin fines due to resin breakage. The most common cause of resin oxidation is free chlorine in the feedwater. Others may be high temperature and dissolved oxygen. An effort should be made to eliminate the cause of oxidation.

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#### IRON IMPURITY ANALYSIS

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	As Received
Iron (Fe) ( g/ft3)	0.42

The iron fouling on this resin is negligible and should not impair the normal operation of the resin.

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#### PARTICLE SIZING

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US Standard Sieve (% by volume)	As Received
ON 16	0.01
ON 20	6.74
ON 30	35.93
ON 40	48.47
ON 50	8.58
ON -50	0.27

The particle size analysis of this resin is within normal limits.

COMMENTS: The screen analysis was performed on the mix.



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The interpretations and recommendations made concerning this resin are based on the results of the resin analysis and the information accompanying the sample. More detailed recommendations cannot be made without specific information regarding the systems and process in which the resin is used. Other factors such as mechanical deficiencies in the deionization equipment, changes in the feedstream, and regenerant chemical purity can affect unit operating operating cycles and effluent quality.

Unless resin replacement was advised, we would recommend that the resin be resampled in six months and resubmitted for analysis to monitor its condition and to track any trends that may be occurring.

The reported results are representative of the sample as received.

### OUR REPRESENTATIVE IN YOUR AREA IS:

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ANALYZED BY: \_\_\_\_\_