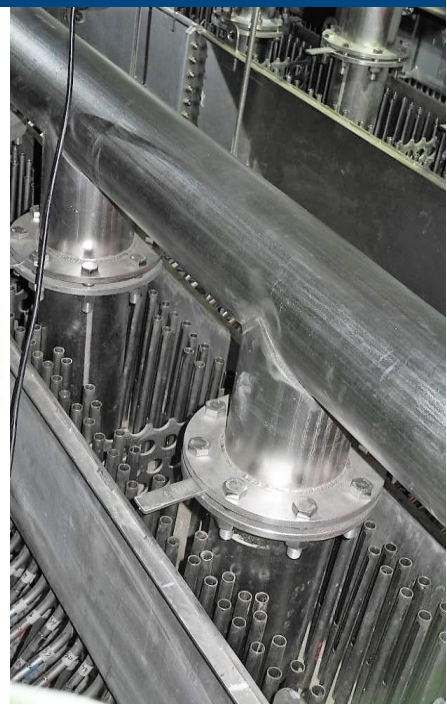
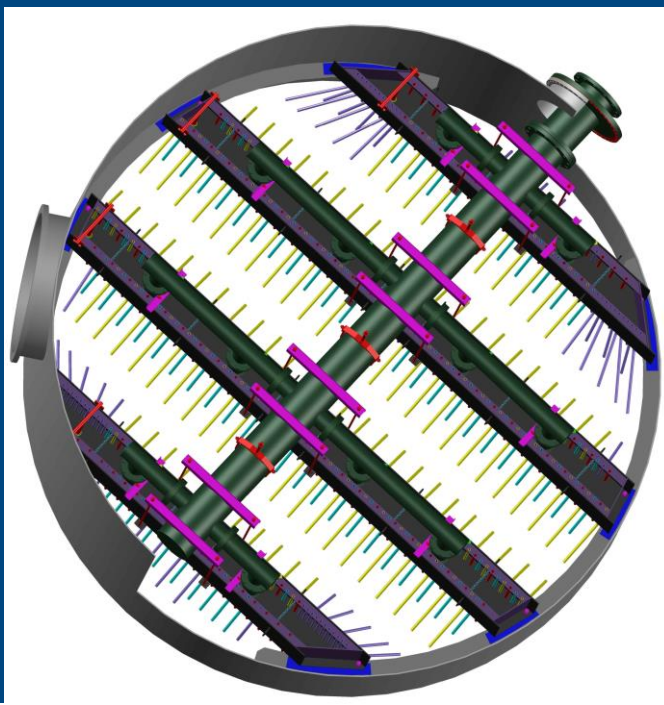


NORAM
SULFURIC ACID
Products and Services

NORAM TROUGH ACID DISTRIBUTORS



The **NORAM Trough Acid Distributor** provides effective acid distribution with a time-tested and proven design used throughout the sulfuric acid industry.

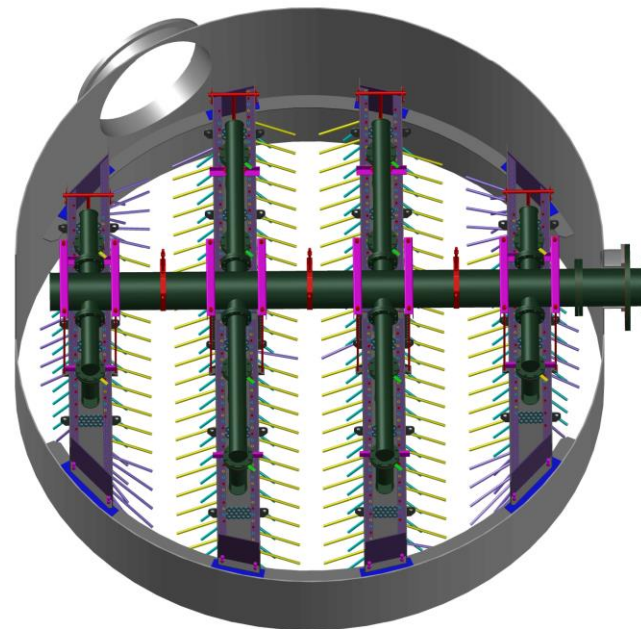
The NORAM Trough Acid Distributor is comprised of a single central header pipe penetrating the wall of the tower in which it is installed. This pipe splits into several branch pipes which split the inlet stream evenly. From these branch pipes, evenly-spaced feeder pipes descend to deliver acid to the troughs. The use of these feeder pipes ensures that no horizontal fluid momentum is transferred into the trough, allowing for a more even trough level and distribution.



The NORAM Trough Acid Distributor design makes use of evenly spaced downcomer tubes to distribute the acid evenly across the tower cross-section. These downcomers extend into the packing volume directly, reducing acid spray and mist formation, in turn lowering the maintenance costs associated with the tower demisters. The even spacing of the downcomers ensures an even distribution from the trough to the packing.

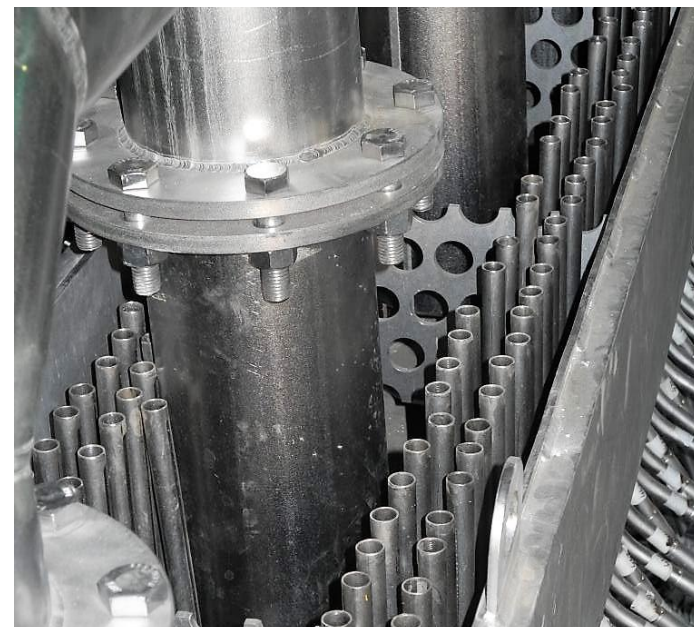


The NORAM Trough Acid Distributor design utilizes assemblies attached to the tower wall for the purpose of post-installation leveling and adjustment. This ensures a very even and stable liquid height in the trough, resulting in equalized flow through all downcomers. With this method, the trough distributor achieves a very uniform distribution.



Uniform Acid Distribution Throughout Tower Cross-Section

The NORAM Trough Acid Distributor has evenly spaced downcomers discharging inside the packing domain to ensure uniform acid distribution. The feeder pipes are used to normalize the flow into the trough and negate the effects of the horizontal fluid momentum. This ensures that the flow distribution in the trough, and thus the downcomers, is uniform.



High Reliability

Trough distributors have been used in the industry for decades. Throughout the use of these distributors, they have been known for their reliability and high degree of tolerance for varying operating conditions. The NORAM design improvements result in an even greater reliability compared to past designs.

Usage of Feeder Pipes

The feeder pipes evenly split the acid stream in the branch pipes, which then split the inlet acid stream evenly. This even split, combined with the design's intrinsic momentum cancellation, ensures an even flow distribution from the NORAM Trough Acid Distributor.

Superior Fabrication Materials

The NORAM Trough Acid Distributor can be fabricated using a wide variety of construction materials. These range from corrosion resistant stainless steels to high silicon alloys such as NORAM SX[®]. NORAM SX[®] offers a wide variety of benefits from superior corrosion and mechanical resistance to ease of workability, thus making it well suited for acid distributor construction.

Minimal Acid Entrainment

The downcomers are arranged to discharge directly into the packing volume. This eliminates the formation of acid spray or mist from the discharge streams.

Reduced Number of Downcomers

By increasing the downcomer diameter, the number of downcomers is reduced by more than 50%.



Ease of Installation

The NORAM Trough Acid Distributor is designed in such a way that each trough can easily fit through the manway of the tower, even with the downcomers attached. As such, installation is rendered much easier and faster. This saves potential costs associated with installation labor and plant shutdown.

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NORAM STAINLESS STEEL CATALYTIC CONVERTERS

NORAM RF™ RADIAL FLOW GAS-TO-GAS HEAT EXCHANGERS

NORAM SF™ SPLIT FLOW GAS-TO-GAS HEAT EXCHANGERS

NORAM BRICK-LINED ACID TOWERS

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NORAM CELLCHEM SULFUR BURNERS

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NORAM TROUGH ACID DISTRIBUTORS FOR ACID TOWERS

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NORAM ACID DILUTION SYSTEMS

NORAM SX™ MATERIAL

NORAM SX™ ACID DISTRIBUTORS

NORAM SX™ PIPING

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NORAM GAS DUCTING

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