

NORAM
SULFURIC ACID
Products and Services

NORAM SX™ ACID COOLERS



One of the greatest improvements in acid cooler design is the introduction of the alloy shell and tube acid coolers.

NORAM SX™ Acid Coolers provide a very simple, reliable and low maintenance solution for acid cooling since the excellent corrosion resistance of NORAM SX™ eliminates the need for anodic protection. In combination with other carefully selected alloys it also allows for the use of a variety of other cooling media.



Operation is considerably simplified without any electronics to monitor or control. The risk of acid cooler failures resulting from malfunction or operational problems with the electronic passivation system is completely eliminated.

Maintenance cost is minimized by eliminating the need for inspection and maintenance of the anodic protection system, as well as for the associated spare parts.

The excellent properties of the material allows NORAM SX™ acid coolers to be designed for an optimal thermal performance, without the limitations on acid velocity and acid temperature as is typical for anodically protected coolers and plate and frame coolers. The benefit is a compact design with a large operating flexibility.



Every alloy acid cooler is individually designed and optimized to meet the specific process conditions and preferences of the client. The performance is well proven and the team at NORAM has more than 25 years experience in the design and operation of shell and tube acid coolers.

The alloy acid cooler is the perfect alternative for replacement acid coolers, particularly in cases of increased capacity as well as for new installations. The long life, reliable and simple operation results in a low life cycle cost.

Offered equipment includes:

- Drying Tower, Absorption Tower, Final Absorption Tower and Product Acid Coolers
- Boiler feed water heaters
- Sea water Acid Coolers



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**Ask about the products and services
NORAM supplies to the sulfuric acid industry:**

NORAM PLANTS, PROCESSES, SYSTEMS, AND PROCESS EQUIPMENT

NORAM PLANT UPGRADE AND DEBOTTLENECKING ENGINEERING STUDIES

NORAM/CPPE HYBRID SULFURIC ACID PROCESS (HSAP)

NORAM CLEAN START™ PROCESS

NORAM PLANT PREHEATING SYSTEMS

NORAM'S TURBOSCRUBBER FOR GAS SCRUBBING

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

NORAM SULFUR & SPENT ACID BURNERS

NORAM CELLCHEM SULFUR BURNERS

NORAM ANODICALLY PROTECTED ACID COOLERS

NORAM SX™ ACID COOLERS

NORAM SX™ TOWERS AND NORAM SX™ PUMP TANKS

NORAM EQUIPMENT INTERNALS, PERIPHERALS AND ANCILLARY EQUIPMENT

NORAM HP™ SADDLE PACKING FOR ACID TOWERS

NORAM SMART™ ACID DISTRIBUTORS FOR ACID TOWERS

NORAM TROUGH ACID DISTRIBUTORS FOR ACID TOWERS

NORAM SX™ CHIPGUARD CG™ ACID STRAINER

NORAM ENTRAINMENT MITIGATION DEVICE (EMD)

NORAM ACID DILUTION SYSTEMS

NORAM SX™ MATERIAL

NORAM SX™ ACID DISTRIBUTORS

NORAM SX™ PIPING

NORAM SX™ VALVES

NORAM GAS DUCTING

NORAM DAMPER

NORAM SULFUR GUNS

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