SOLUTIONS | Case Study

Soleplate grouting and anti-acid protection accomplished with one epoxy grout leads to an innovative process for sulfuric acid secondary containment in the mining industry.

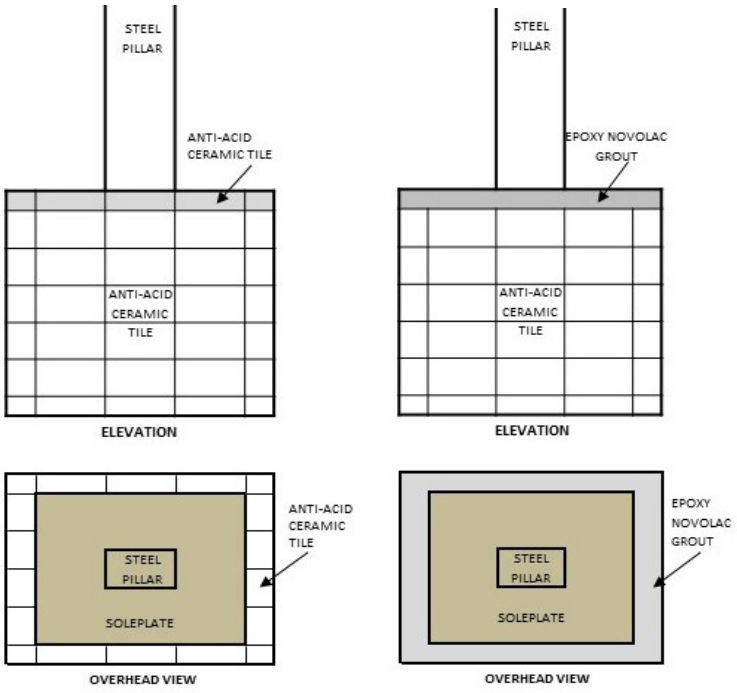
CODELCO Chuquicamata Copper Smelter Complex Sulfuric Acid Plants 3 & 4 Absorption Towers

Antofagasta Region, Northern Chile

Product:

Five Star® Epoxy Novolac Grout

Copper Smelter Complex Sulfuric Acid Plants



Current Process

Step 1: Place cementitious grout under soleplate.

Step 2: Place anti-acid ceramic tile over the cementitious grout.

Five Star® Epoxy Novolac Grout Solution

Only 1 Step: Place epoxy grout under soleplate. The grout also provides the anti-acid coating negating the need for anti-acid ceramic tiles.

Date of Project: April 2018

Project Owner: Codelco (Corporación Nacional del Cobre de Chile)

Project Contractor: Eimisa

Project Engineer: SNC-Lavalin

Market/Environment: Mining

Substrate: Concrete

Size of Project: 311.48 ft^3 (8.82 m^3)

The Challenge

Corporación Nacional del Cobre de Chile (Codelco), one of the largest copper producers in the world, contracted with SNC-Lavalin to construct two sulfuric acid plants at the Chuquicamata Copper Smelter Complex. The plants will treat off-gas from the Chuquicamata smelter, each producing up to 2,048 metric tons of market grade sulfuric acid per day.

An effective solution was needed to contain acid leaks from the six absorption towers; three towers per plant. The current method is to use cementitious grout under the soleplate and then place anti-acid ceramic tiles on top to protect the grout and subsequently the concrete from acid leaks. There are two issues with this process: first, the anti-acid ceramic tile placement is a tedious and time-consuming manual process; and second, the sulfuric acid eventually penetrates the anti-acid ceramic tiles and attacks the absorption tower's concrete base supports.

Five Star® Solution

MC Bautek - Chile, Five Star Products' licensee, proposed an innovative solution for protection from sulfuric acid leaks; a single product to grout the soleplate as well as provide an anti-acid coating - Five Star® Epoxy Novolac Grout. SNC-Lavalin, the project engineers, agreed to this new concept for secondary containment and specified Epoxy Novolac Grout for the assemblage of the six absorption towers.

Each absorption tower contains eight supports. Approximately 1 cubic meter was used to grout each tower. Due to Epoxy Novolac Grout's durability and high chemical resistance throughout its entire mass, a subsequent anti-acid coating was no longer required resulting in reduced labor and product costs. The towers were placed into service faster than with conventional secondary containment methods which in turn expedited plant availability.

Five Star® Epoxy Novolac Grout

High Chemical Resistance

A three component, highly chemical resistant, 100% solids grout designed for industrial applications in aggressive chemical environments where exposure to concentrated acids, alkalis, corrosives or solvents can occur.

- Excellent impact and wear resistance
- 95% Effective Bearing Area (EBA)
- Secondary containment
- Exhibits positive expansion per ASTM C 827, nonshrink
- Superior bond to concrete or steel
- Excellent flowability

FIVE STAR® SERVICES

- Design-A-Spec™ engineering specification assistance
- Technical on-call center with field and project experienced staff
- Field support representatives for on-site consultation
- Corporate research laboratory available to customize products for unique applications

For worldwide availability, additional product information and technical support, contact your local Five Star® licensee, distributor, local sales representative, or you may call the Five Star Products' Engineering and Technical Service Center at 1-800-243-2206.

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