

REPORT NO: DCQ/ NGP/2023-24/05

APPLICATION REPORT

INTERNAL ANTI CORROSION COATING OF DM PLANT- CPU MIXED BED TANK(VESSEL)



**AT
ITC LIMITED
PAPERBOARDS & SPECIALTY PAPERS DIVISION, SARAPAKA,
BHADRACHALAM, DIST. BHADRADRI-KOTHAGUEM
(TELANGANA)**

INTRODUCTION:-

DIFFCOR division of DIFFUSION ENGINEERS LTD successfully completed job work for Anti corrosion coating in CPU Mixed bed tank. This job work was carried out for our customer ITC Limited, Bhadrachalam. Our customer was facing the problem of corrosion. Coating was done with DIFFGLASS XTREME.

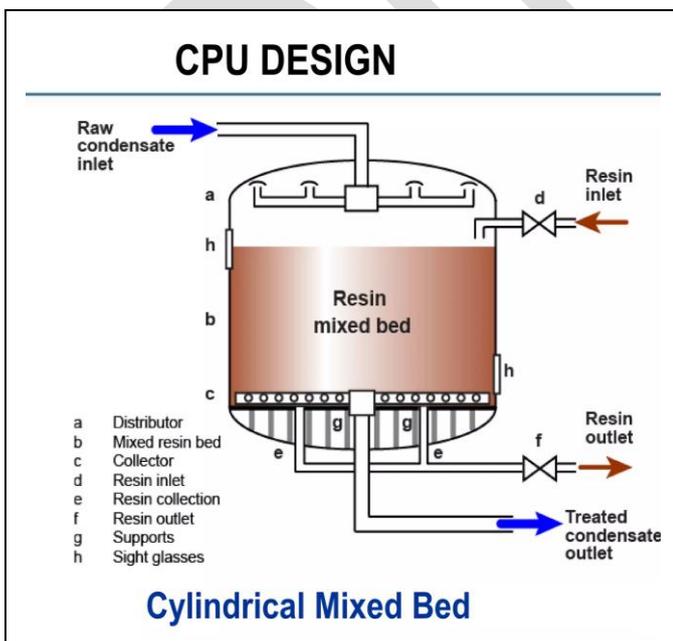
In paper industry raw water which is use for steam generation should be free from organic ions (such as carbonate and bicarbonate); inorganic ions (such as Na, SiO₂) & dissolved gases (such as CO₂, NO₂, and Free Chlorine). When water is heated to produce steam, such ions create corrosive of metal and reduces the steam quality. These ions create scaling of metal surface by decreasing boiler efficiency. To remove these impurities ion exchange and other process are used.

De mineralized water (DM) Plant:-

DM is water that has been purified in such a way that (most of) its mineral- and salt ions are removed. You can think for example of Calcium, Chloride, Sulphate, Magnesium and Sodium. De mineralized water is also known as demi water or de ionized water. In this way salt ions are being removed. The purpose of DW water is to reduce its ionic effect and reduce its conductivity.

Condensate Polishing Unit (CPU) Mixed Bed (MB):-

During the process of steam generation in power plants, the steam cools and condensate forms. The condensate is collected and then used as boiler feed water. Mixed Beds are ion exchangers that have both Cation and Anion resins, mixed in a single vessel. The resin bed is in the both H-OH form. These units are normally designed so that they can be automatically operated, with all the necessary internals, instruments, components and controls. As there are cations and anions in the water, two different types of resins are use, a cation exchanger and an anion exchanger. This combined arrangement produces pure water. Demineralization is also called deionization. The cation resin is used in the hydrogen form (H⁺) and the anion resin in the hydroxyl form (OH⁻), so that the cation resin must be regenerated with an acid and the anion resin with an alkali.

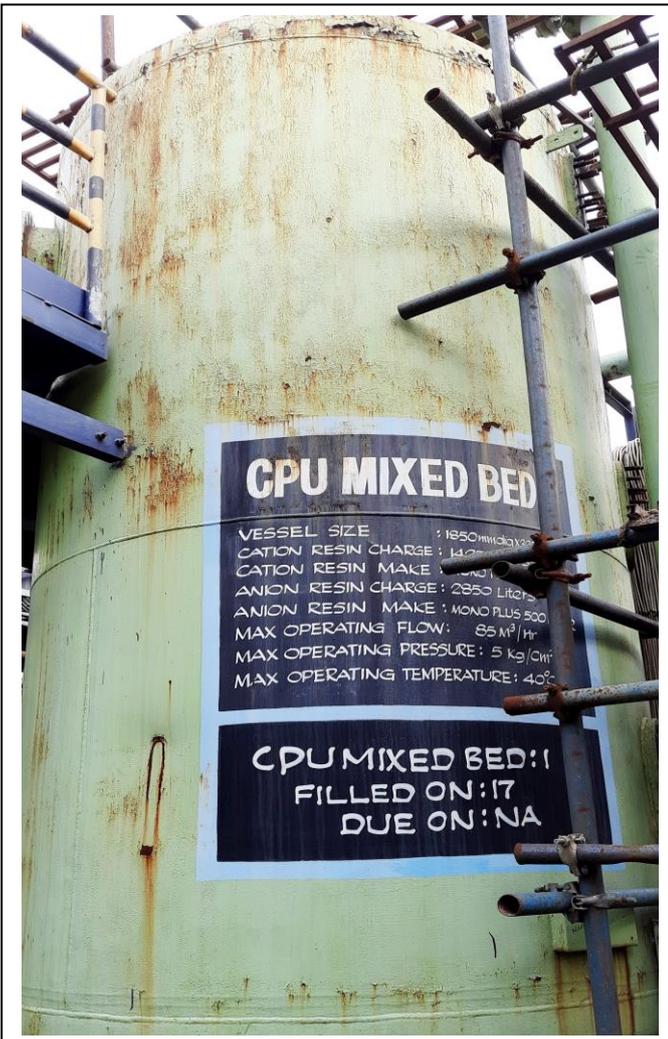


Process diagram of CPU MIXED BED TANK (VESSEL)

PROBLEMS:-

Acids are chemical compounds having less pH value. PH is a measure of the hydrogen ions present in a solution which are available to attack and degrade materials. Organic acids contain carbon and mineral acids contain elemental metals. Hydrochloric acid, hydrofluoric acid and sulfuric acid attack and degrade rubber.

Alkalis are chemical compounds with a pH of greater value and have high numbers of hydroxide ions present in solution. Sodium hydroxide is a strong alkaline base and is harmful to rubber and base metal, especially at elevated temperatures. During ion exchange process HCl acid and NaOH are used in tank which causes which causes cracks and damage in rubber lining as the cracks are generated on rubber lining the corrosive media attack to base metal and corrosion starts below rubber lining.



Rubber lining damages inside CPU TANK (VESSEL)

PRODUCT RECOMMENDED:-**DIFFGLASS XTREME:-**

DIFFGLASS XTREME , a heavy-duty lining system for concrete and steel substrates that offers unique combination of vinyl ester novolac resin with Glass flake reinforcement and inert mineral fillers produce a dimensionally stable coating with extremely low permeability and ideally suited for immersion service , splash/spillage exposure of concentrated acids and aggressive solvents.

APPLICATION PROCEDURED:-

A. SURFACE PREPARATION:

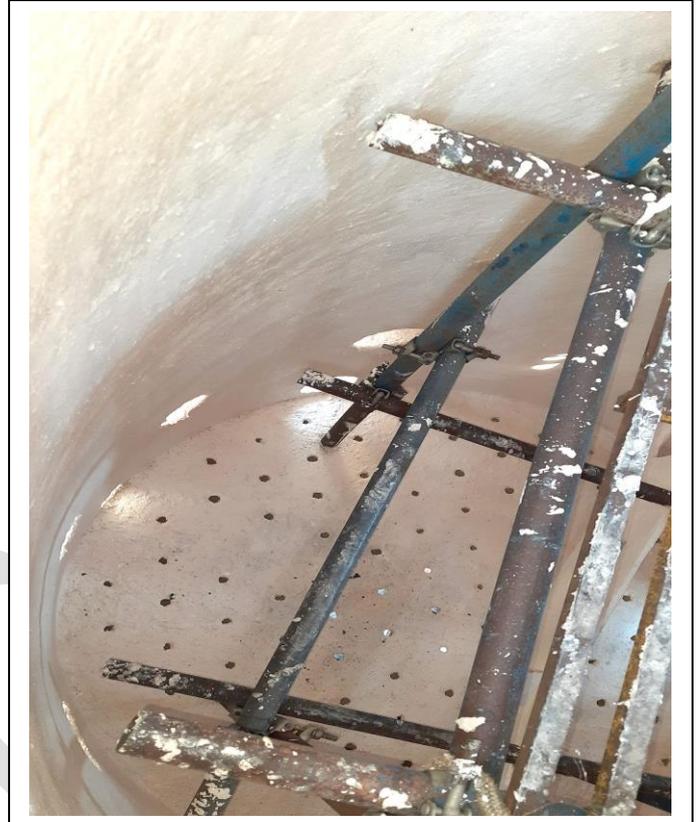
1. Before application of any kind of coating surface preparation is must to activate the base metal so that coating will have better bonding.
2. Removed existing rubber lining inside the CPU tanks before started Grinding and Blasting.
3. After removed rubber lining, rubber spatters removed by Grinding from base metal of tank.
4. After Grinding, surface was cleaned by grit blasting to remove all loose particles. As per ISO standard surface preparation of SA 2 1/2 by blasting with surface profile achieved of 70-90 microns.



Rubber lining removed & Surface preparation done by Grit Blasting

B.PRODUCT APPLICATION:-

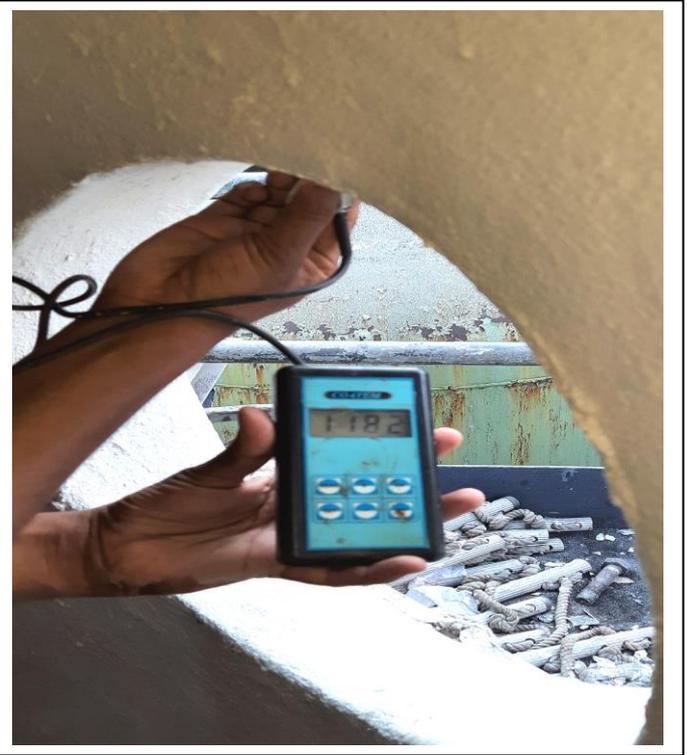
1) After surface preparation Priming and Top coat of **DIFFGLASS XTREME** was applied inside CPU mixed bed Tanks to improve resistance against corrosion.



Application of DIFFGLASS XTREME as a Primer coat & Top coat

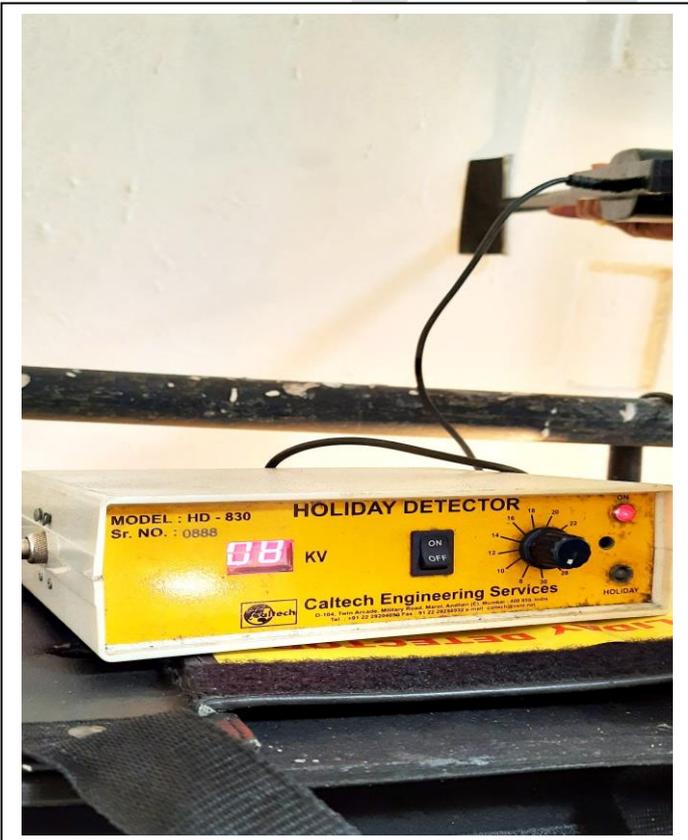
INSPECTION OF BLASTING AND COATING:-

1) Dry Film Thickness (DFT): Min. 1000 Microns.



DFT measured on Top coat of DIFFGLASS XTREME coating

2) Spark test (Holiday): Min. 8 Kv



Spark checked on Top coat of DIFFGLASS XTREME coating

PERFORMANCE CERTIFICATE:-

We have received repeat work order for the DM plant-CPU tank (CPU#01, CPU#02 and CPU#03) after completion of warranty period. Total 3 nos. of CPU tank coating work was completed in February 2013 and after repeated CPU tank work order, coating job work was completed in December 2020.



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TO WHOMSOEVER IT MAY CONCERN

This is to certify that M/S Diffusion Engineers Ltd., Nagpur has been awarded service order for Diff-Glass Extreme coating to internals of our Condensate polishing vessels at- our DM Plant on 15.02.2013.

The job was completed successfully in Feb'13 and kept the vessels in service.

The vessels has been inspected on 24.01.2014 and the physical condition and Holiday (spark) testing results found satisfactory. The overall performance is found good.

Thanks & Regards

T Murali Krishna
Dy Manager
Utilities Dept.
ITC-PSPD, Badrachalam

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FMCG & TOBACCO • HOTELS • PAPERBOARDS & PACKAGING • AGRI-BUSINESS

ACKNOWLEDGEMENT:-

SITE ENGINEER: -

Mr. Ashish Ganvir (Sr. Technical Officer)

AREA ENGINEER:-

Mr. Vinod Yadgiri (Business Manager)

AGENCIES INVOLVED:-

Shri. Lakshmi Tulsi Enterprises, Rajahmundry

APPLICATION TEAM:-

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