

INDUSTRIAL DRYER

GAURANG SHAH, HARSHIL BHATT, SMIT PURANI, AJINKYA ASNIKAR

Students

D.A.DEGREE ENGINEERING AND TECHNOLOGY.

ABSTRACT

In this research work the optimum solution provided to the industry. The problem we found with the industry which is a basic problem but having no optimum solution for it by the industry. And we get the idea from the microwave oven in the kitchen. This research is a solution for an industry based problem which could help them to grow in the competitive markets with no compromise over the quality demands by the customers.

Introduction:-

This project is IDP (INDUSTRY DEFINED PROJECT). As one of our team member Mr. Harshil Bhatt is working in a industry named as RMS Engineering which is situated in Sanand, Ahmedabad, Gujarat and it is manufacturing company of threaded zinc rods. Once he had a discussion with us about the industry facing huge losses by the rejection of threaded rods due to white corrosion dots which was exported. So we started understanding the reason and process behind the “white corrosion”. The process after zinc coating is to dip the threaded rods into water and the water needs to be dried into sunlight which sometimes makes the water droplets remain on the rods and it goes for the packaging to supply which converts into the corrosion form which is white in colour and due to this rejection issues arises. And we understood the need of industry to overcome huge losses and to maintain quality in product. The Industrial Dryer having the solution of removing the main factor of rejection faced earlier by the industry.

Literature Review:-

The research concerns the study of corrosion effects on different threaded elements to analyse bolted joints working in a saline environment. In particular, this article examines the mechanical behavior of a M8 junction realized by different steels and subjected to different degrees of corrosion. Four materials were investigated: a low-alloyed structural steel in the original condition and the same after zinc-plating; a quenched and tempered steel; and an austenitic stainless steel. For each

steel were tested a certain number of threaded rods exposed to a saline water solution, simulating the atmospheric exposure to an aggressive environment. The samples were characterized by different intervals of exposure. During these periods, the threaded elements (threaded rods) were kept in tension applying a tightening torque proportional to the yield strength of the tested steel, to evaluate their susceptibility to stress corrosion cracking. Before and after the different corrosion steps, some metallographic analyses, static tensile and fatigue tests, were carried out to determine, for each sample, the degree of corrosion and its influence on the reduction of the junction resistance. In order to evaluate the stress-intensifying factor and its variation with the imposed degree of corrosion was carried out a FEM analysis.

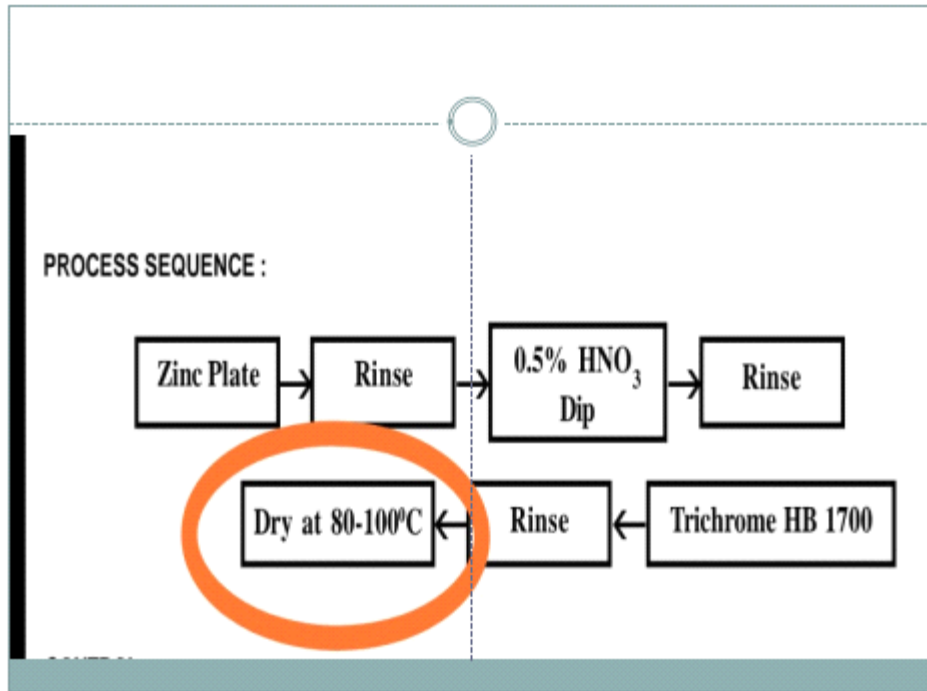


Fig. Is taken from TRICHROME HB 1700



Above figures had been clicked in RMS ENGINEERING

Aim and objective:-

The project having the objective to resolve the problem arising in the industry related to moisture removal process. The aim of project is not just the overcome huge losses to an specific industry but by the removal of moisture contents from the threaded rods can increase the life span and having increase in safety of mankind as it is used to stabilize structures, they can be inserted into various materials like concrete, wood or metal to either temporarily create a steady base during construction or they can be installed permanently.

Methodology

Drying is a mass transfer process consisting of the removal of water or another solvent by evaporation from a solid, semi-solid or liquid. This process is often used as a final production step before selling or packaging products.

A source of heat and an agent to remove the vapor produced by the process are often involved. In bioproducts like food, grains, and pharmaceuticals like vaccines, the solvent to be removed is almost invariably water.

Desiccation may be synonymous with drying or considered an extreme form of drying.

In the most common case, a gas stream applies the heat by convection and carries away the vapor as humidity. Other possibilities are vacuum drying, where heat is supplied by conduction or radiation while the vapor thus produced is removed by the vacuum system.

So most suitable as per the industry requirement is convection method.

Experimented Results

Sr no.	Date and time	Conditions	Results	Material Loaded (Y/N)
1.	13/04/2021 5pm	Without insulation on the outer surface without air flow	Temperature gained 70' to 90' C within 8-9 minutes	N
2.	15/04/2021 6:30pm	After applying insulation on	Temperature gained 70' - 90' C within 7-8	N

		outer surface	minutes	
3.	21/04/2021 4pm	With air flow	Temperature gained 70' - 90' C within 6-5 minutes	N
4.	30/04/2021 2pm	With air flow	Temperature gained 70' to 90' C within 6 minutes but desired result found in 15-16 minutes	Y

Conclusion:-

With the use of this Industrial Dryer we can say that the machine can fulfill the requirement of the RMS Engineering satisfactorily as it is concluded on the basis of trials done for the approval of the project after installation completed at industry premises and as it is customizable at certain requirements if needed in future so any other industry which has the requirement of drying process can go through this project.

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