

Latest Developments in Utilizing Solar Radiation in Corrosion Removal Maintenance Techniques Towards Environment Protection and Enhanced Life of Steel Structures

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ABSTRACT

Incremental demand in the maintenance and repair industry required economical solutions for corrosion removal. Due to various causes, damage within any structure occurred because of corrosion. This corrosion not only harmed the economy but also the lives of the people. Nowadays corrosion is the major important reason of the failure of the structure and this occurred due to because of not provide maintainace to the structure, because current method available in the market is very tedious and skilled labor is required for it.

By considering this problem we developed an effective solution for removes the corrosion but also increases the life of the structure, the mechanism used to remove corrosion is know as Sanjivani, this method is based on the principle of V-Intensity and Concentration Light. various method available in the market is not economical and effective than Sanjivani method. Our motto is to develop such corrosion removal method which economical and easy to use because we connect the various harm occur due to the failure of structure is occur because of corrosion. To remove corrosion we developed V-Intensity equation, with the help of V- Intensity equation we changed the intensity of light according different materials.

KEYWORDS : *V- Intensity, Sanjivani, Solar radiations.*

INTRODUCTION

These solar radiation technique is the renewable technique with the use of this technique the maintains is occur economically, the mechanism used to remove corrosion is know as Sanjivani.

Scientific approach of corrosion detection and protection

To solve this problem effectively and cost-effectively, careful selection must be made. A comprehensive inspection is required to detect faults and evaluate the

area of damage. Corrections will be made depending on the situation. We hope to choose the best treatment for home. The recovery process often depends on which element carries the load and which element uses the load.

Visual inspection

Using corrosion removal V power method, we can easily remove corrosion as engineers using this model can inspect the model. This is the easiest way to remove corrosion. In this way, we use solar energy to eliminate

corrosion and with the help of solar energy we can easily remove corrosion.

Board

The institutional level includes gathering information about the terrain, collecting information about materials, or classifying hazards/hazards.

Non – harmful analysis experiment

Cement aggregate mixture or roller-compacted concrete components can be subjected to various negative analyzes and many properties of the product can be determined. These various tests are useful in assessing hazards in concrete or reinforced concrete. Prevent external damage from rust caused by chemicals and other causes. This test includes load capacity or resistance to deformation, quality, etc. It does not affect the structure in any way. This test can be done on-site or in a closed laboratory.

INNOVATIVE STRATEGIES IN STRUCTURAL REPAIR

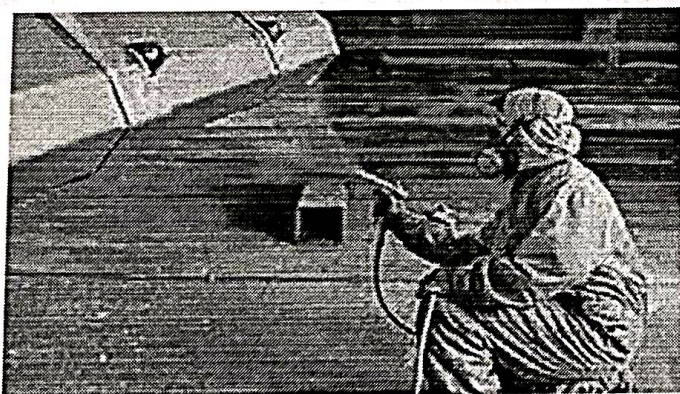


Figure 1 : Anti-corrosive Treatment.

It's an regular process for specific covering (layering) structure to guard the iron or any ore. External surface of member from chemical of weather action likes rust this coats consist of electron, iron , metal , natural lubricant , beeswax, auto deposition power coating preservation of coats are similar to phosphate preservation coats increase efficiency of oil-distemper paints etc. To connect about metallic or iron external face.

Zinc coating area unit sometimes created passive area covering by preventing coat about reinforce steel thus rust prevention about initial fashioned covering opposed to creation or generation of colorless corrosion ' it can

be an easily removable coat about metallic element OH- and HCO₃-.

Votive anti-cathode electrode prevention

(VAEP) could be formed about anti-anode prevention wherever not so much as imperial matter which behaves similar to Votive anti-cathode joined through silver as material to allow flow of current to system and then member which we are protecting. The applicable material for this are metallic elements.

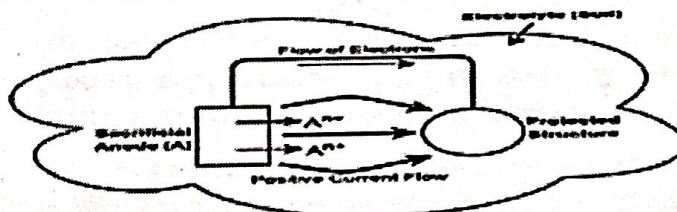


Figure 2 : Cathodic Protection.

Electrode Guard (e.g.) known as identical solely automation used for obstruct erosion by chemical action at certain RCC structural element not withstanding compound in chlorine together with other elemental group and its amount within RCC element. Atoning otherwise voltaic accelerator opposite to cathode-method in purpose construction material applicable lot of susceptible ore metal line (opposite to cathode) like metallic elements as an alternative (In -Al – Zn) forms a shear movements of positive or negative electrons putting to finish opposite to cathode structure area unit supported works on assumption about differing or unlike ore rust. Therefore parallel location or comparative position about various ores within that galvanize chain electricity made through potential latent dormant variation betwixt anti cathode and RCC 'once join . Putting to finish anti-cathode can rust through this method and use exhaust completely.

Externally applied power supply through electrode safeguard (E.A.P.S.E.S).

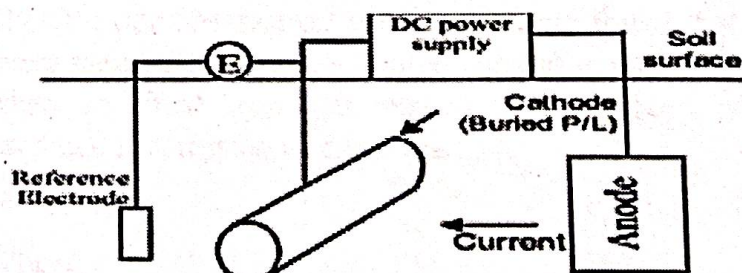


Figure 3 : Exter

Externally applied power supply through electrode safeguard

(EAPES) Embrace about putting to death anti cathode join to non-internal electric supply. Non internal supply could be direct current offer delivers the demand or need for working electro chemical response to electrode guarding be form within the in consistency or stoppage or direct current supply generator adopt join to alternate current may be utilize various origins are required for power supply to the chemical science unite considering blast, star, vapour electric supply creator. Correlated power electrode guard structure area unite theoretically utilize by comparatively joint system.

Wherever unassertive anti anodic guard ways area unit not effective else theoretical preferable they rely upon non-artifial voltage betwixt anti cathode ,anti-anode (EAPSES) Structure applied to non- internal source of supply mandatory theme is powered thus incremental power made its potential to electrode guarding reach broad expand space where as (EAPSES) structure area unit a lot of effective passive counter-parts they needed a lot of equipment and also costlier to keep up.

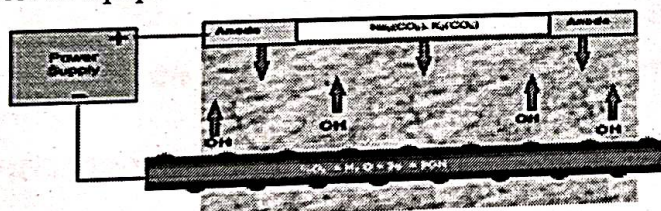


Figure 4 : Electrochemical Re-alkalization (ERA)

Mixture of carbon and iron of very high temperature made of this material outside face or exterior face about destruction region or zone also kept ready about a minimum of a close colorless ore end. Exterior face establishment traditionally took spot at a parallel time about connecting destruction, detrition, external surface or any other surface synchronization may have been carried out through ultra-high force per unit area done by liquid explosion aggravating and gas.

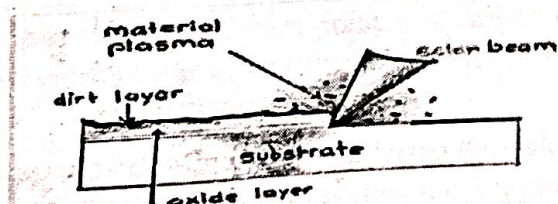


Figure 5 : Application of V-Intensity (VI)

1. Solar cleaning is the environmentally friendly and sustainable process. Applicable to remove corrosion, organic matter, iron oxide, other oxide and other contaminated material from metallic surface, it is very economical and effective; it requires 1800-degree Celsius temperature at maximum working efficiency.
2. Current cleaning techniques are very complicated, time consuming and require large amount of capital costs also human efforts requires in it and they can get affected by dangers chemicals needed for the process. E.g., Existing paints are clean by sand blasting can be damage the metal below it.
3. From this point we can understand that our method is effective, fast, environment friendly Easy to use, do not require well train labors, this method is the future of the maintenance and repair.

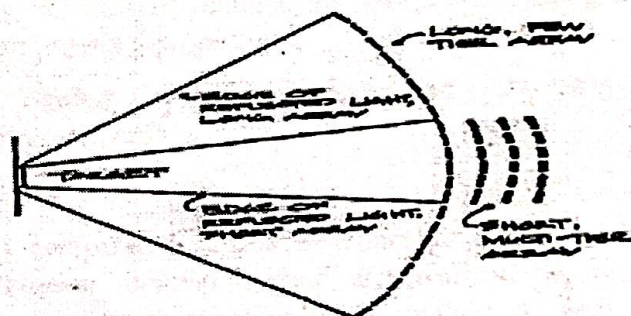


Figure 6 : Light Reflection Priciple by Our Way

APPARATUS

Mirror 5x5 with specified vacuum.

Silica optical fiber which has melting point above 20

Dial gauge with specified control on intensity.

Opening nozzle concentrate out the intensity of V- int Control valve

Principle of V-Intensity

Thought our observation and research we found that every material surface has desired point of temperature where specified layer gets vaporized, this process is used in our corrosion removal method.

$$V = mDdk$$

Where,

V = energy required

m = mass

Dd = Temperature

K = Constant of V-intensity (generally 0.014)

Application of the V- intensity:

a. V-intensity

b. V- intensity used for cleansed pipeline, nuclear power plant, cleansed rust of the bridge parts

c. Remove rust before and after the welding this point we can understand that our method is cost effective, fast, environment friendly Easy to use, do not require well train labors, this method is the future of the maintenance and repair.

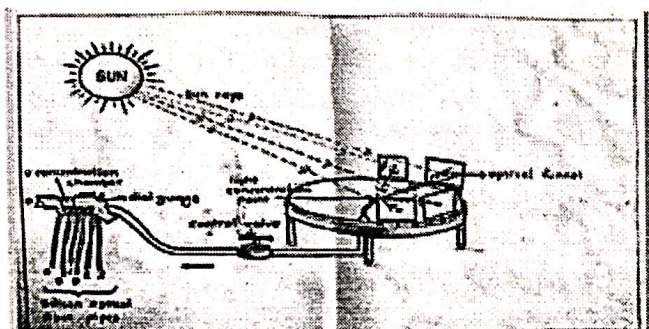


Figure 7 : Diagrammatic Representation of Sanjavini Method

PROCESS

1. The setup the vacuum will help to adjust the

parabolic mirror, focal length to generate desired energy at every point is done by arranging mirror longitudinally and angularly. The mirror panels are design to have artificial intelligence to move along the direction of sun and most important to keep the focus of energy on a same point at any time it will also calculate and adjust focal length by programmable Arduino with pressure to current and vice versa, input output with relation to natural environmental change also.

2. The point ABCDEFVV' are properly worked and kept ready the energy from point A is carried through silicon optical the length of these cable from AV', BV', CV', DV', EV', FV' are kept same.

3. The energy concentrated is collected through energy funnel of standard optical properties at every point then it is transferred through optical cable from point to

concentration chamber. (The valve is used to regulate flow of energy and also emergency overload.)

4. Concentration chamber the energy from various optical pipes is concentrated inside the chamber which has very high melting point the solar intensity is maximum by fusing is together the high energy is directly applied on the surface of material and rust is removed.

5. The V- intensity for every material is calibrated in dial gauge as per the material or coat to be removed. It will be calculated by a standard given formula $V = mTtk$

6. The energy shooted from the nozzle or opening of gun will remove the corrosion layer fully then in worst condition a secondary or a miscellaneous treatment also be used by using a well proportionate mixture of baking soda or sprinkle salt with raw potato or mixture of lemon, vinegar, potatoes, abrasive, barax, baking soda, salt in proper proportion.

5. Hardest situation phosphoric acid (50% case) and nitric acid (25%).

RESULTS

By comparative results we conclude that the current corrosion removal method are available in market is not as much effective as our method. As with any machine, most of its components are fixed, while some are replaceable. such as tools or machines and their products constant and continuous services like removal of the corrosion and others. As the after removal of corrosion by v intensity method we done tensile testing on it after that we found that it regain its original strength. Due to this corrosion removal method material is trial to regain its original strength .with the help of this method 95% of corrosion is removal by using sustainable and economical method. Every material has different melting point so according to that we developed a equation and according to it we apply certain intensity on it.

CONCLUSION

Due to the use of V- intensity method we fulfill our major important aim at the time of corrosion removing do not affect the strength of the material , we remove corrosion effectively by using the V- intensity method , the number of V-Intensi is vary according the nature

of the material Our motto is to develop such corrosion removal method which economical and easy to use because we connect the various harm occur due to the failure of structure is occur because of corrosion. To remove corrosion we developed V-Intensity equation, with the help of V- Intensity equation we changed the intensity of light according different material.

The process is done in small portable plant with brushes, washing, cleaning, rubbing; application is possible with manual and mechanical means. This step is very easy to perform and mostly not requires to use just given in any case of failure of miscellaneous problem.

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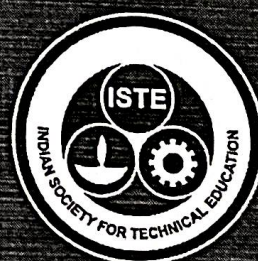
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