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CONCRETE REPAIRING BY SAROTHANE (P.U.R. POLYMER)

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ABSTRACT

Maintenance and repairing is obviously an essential issue in all various industries which negligence in such cases will cause detriment and loss either in efficiency or capital and economy. The experts, inventors, also the scientists are mostly looking in to and researching to find new technologies to improve or make more qualified remedies for the concerned sectors and solutions in maintenance and repairs. The following paper which is based on a patent issued at 2008 in IRAN is one of them. Corrosion which is a well-known subject in science and technology is the major problem for deterioration and damages in any kind of industry, also in the nature of substances. Corrosion engineering subscribes that maintenance and repair should be carry out on time – gainfully and by the best technology, Therefore usage of scientific suggestions and acceptable inventions are recommended to be succeed against corrosion behaviors . The concrete material which is widely and majorly used in constructional building industries in facing corrosion would not be sustainable except by usages of safeguarding and anti-corrosive suitable materials.

Polyurethanes which have been named (The hope of young generation) because of wide range of variety in manufacturing and usages in most of industries in our new world, are the best anti corrosive protective polymer to be used as surface protection and also repairing and maintenance in the building industries. About 15 years ago I did some researches to find a way for repairing to surface and also internal damages widely happened on one of the most important reinforced concrete structures used for heavy duty taxiway in an airport aprons, The project was so sensitive as had to be avoided against any movement and fly of pieces of grits caused F.O.D (Foreign Object Damage) in The Jet engines of air crafts.

Differences in temperature during four seasons in which winter freezing cold can be around -20C and summer heath under the sun around 50C or more, by patching new concrete to the old and damage concrete shows crack lines between the new mortar layer used for repairing and the old structures. While the cracks were thin but it is very deep. These cracks would absorb moisture and due to the expansion during freezing temperature may creating loose pieces of dust or sands also causing internal corrosion especially on iron rebars use for reinforcement in concrete which would be expend and cause internal weakness. Because of none succeed activities also by using some special adhesion additives in the cement mortar, especially resistivity against heavy duty services and vibrations against taxi and towing by heavy duty aircrafts on the repaired structure, For finding solutions and safety developments, a needed R&D process as a novel invention by usage of P.U.R.(Sarothane) polymer in internal structure and also external repairs were carried out.

After 12 years under heavy duty services and also by exposing to UV impression activities. The fourteen thousand square meters airport apron area are sound and safe. Obtaining of this experience the mentioned technology has been successfully used in many cases of concrete repairing projects which one of the most common and usual cases is mentioned in this paper, also I am so pleased to be in contact with the well-known civil and corrosion engineers to have communication and changing views about gradual perfection and developments concerned to it.

As we know, there are many problems in concrete repairing works especially under service conditions. Activities such as vibration, steam and water pressure, mostly acting on bridge framing structures, airport apron, offshore and onshore piles, also marine and costal structures, power plants and etc. causes structure deterioration over the time. The most common problem is the different behavior in bonding ability between newly lay cement mortar and the existing structure joints. Dealing with smooth surfaces structure such as column, swimming pool, wall and etc in concrete repairing is time consuming, expensive and difficult. A proper surface preparation is needed in which surfaces need to achieve certain degree of roughness and in some cases using of steel wire as reinforcement before laying new mortar to the old and damaged structure. These typical repair technique do not provided long term solution where require regular maintenance to

repair partial damages in concrete structure. Absorbance of moisture and water through crack lines causes internal corrosion which is critical and may lead to the deterioration of the structure.

Hereby, we wish to introduce a new concrete repair technology and technique to minimizing time and expenses and also achieve maximum efficiency in the sector. Concrete repair by polymer stages are as follows :

- 1) Surface preparation must be carry out in accordance to standard requirement.
- 2) One layer of POLYURETHANE (Sarothane) will be applied on the surface area either by brushing or spray.
- 3) Normal cement mortar for repairing should be prepared as much as needed for each step.
- 4) Apply new concrete mortar as the major material on the polymer surface area before the polymer is cured.
- 5) Any needed framework or mold must be provided before item 4
- 6) Splashed water on the partial repairs area as much as normal needs.
- 7) Framework or molds can be dismantled after normal time frame.

Results and conclusions

- 1) Application of the (Sarothane) polymer with high adhesion characteristic provides strong sealant on the separated pieces of damaged parts of the structure.
- 2) The polymer curing process will continue even in the present of water.
- 3) Curing activities between cement and the polymer used as the sealant joint between the two new and old layers form dual binary bonding.
- 4) Power of stich and adhesive between two layers is much higher than the cement adhesive itself.
- 5) The polymer used as the joint protector act as a perfect water proofing material. Therefore, the partial repairs would be much safer than the other part of structure.
- 6) In any event of vibration, movement and shocks occurred on the partial repaired area, high adhesion and elastomeric property in the polymer would be more steadfastness than the other parts of structure.
- 7) Because of long life (Sarothane) polymer material, even partial repairs would be stable and long lasting as concrete life.

Note: The above mentioned technology is patented by writer of this paper on 2008 In IRAN.