Innovative Epoxy Coating for the Protection of Concrete Structures

P.C. Thapliyal*
Scientist E-I
Central Building Research
Institute, Roorkee, INDIA
pct866@yahoo.com



P.C. Thapliyal, born 1966, received his PG in org. chem. & doctorate degree from the Univ. of Delhi, India. He has over 15 years of exp. & has more than 25 papers to his credit.

S.R. Karade Scientist E-I Central Building Research Institute, Roorkee, INDIA srkarade@cbri.in



S.R. Karade, born 1965, received his civil engineering doctorate degree from the Univ. of Brunel, U.K.

S.P. Agrawal
Scientist F
Central Building Research
Institute, Roorkee, INDIA.
subodhagrawal1@cbri.in



S.P. Agrawal, born 1953, received his chemical engineering masters degree from IIT, Roorkee, India.

Summary: Alternative and innovative building materials have contributed significantly in the growth of construction industry sector and in this context role of organic coatings for the protection of buildings and other related structures have become an issue of vital importance.

In this paper the role and durability studies of newly developed innovative cardanol modified epoxy coating system for the protection of concrete structures has been discussed. This coating is environmentally friendly, safe and economically viable in comparison to the other similar commercially available epoxy coatings. The developed coating has already been commercially tried on bridges, high rise chimneys etc. and found its performance excellent.

Keywords: Coating, epoxy, cardanol, concrete, protection, corrosion, durability, bridges, chimneys.

Acknowledgment: Authors wish to thank Director, Central Building Research Institute, Roorkee for his kind permission to publish this paper.

References:

- [1] MUNGER C.G., Corrosion Prevention by Protective Coatings, NACE, Houston, 1984, pp. 287.
- [2] OLIN H.B., SCHMIDT J.L. and LEWIS W.H., Construction- Principles, Materials and

- Methods, Van Nostrand Reinhold, New York, 1994, pp. 837.
- [3] MAY C.A., *Epoxy Resins chemistry & Technology*, Marcel Decker Inc., New York, 1988, pp. 719.
- [4] AGGARWAL L.K., "IPN protective coating for enhancing the durability of concrete Structures", Ind. Conc. J., Vol. 70, 1996, pp. 367-369.
- [5] AGGARWAL L.K., THAPLIYAL P.C. and KARADE S.R., Anti corrosive paints for the protection of steel structures, Proc. of CORCON 2004, pp.1-11, N. Delhi.
- [6] AGGARWAL L.K., THAPLIYAL P.C. and KARADE S.R., Anti-corrosive properties of the epoxy- cardanol resin based paints, *Prog. Org. Coat.*, Vol. 59, 2007, pp. 76-80.
- [7] IS 101-04, Indian standard for sampling & test for paints, varnishes and related products.

 Part1. Test on liquid paints. Sec. 3. Preparation of panels, Part 5. Mechanical test on

 Paints films. Part 6. Durability tests. Sec. 1. Resistance to humidity under conditions of
 condensation, 2004, pp. 1.
- [8] ASTM D 2370-07, Standard test method for elongation and tensile strength of free films of paint, varnish, lacquer and related products with tensile testing properties, 2007, pp. 472.
- [9] ASTM D 1653-03, Method of test for moisture vapor permeability of organic coating films, Vol. 11, 2003, pp. 1.
- [10] BS 3900-03, British standard methods of test for paints. Part E-10. Pull off test for adhesion, 2003, pp. 1.
- [11] *ASTM D870-02*, Standard Practice for Testing Water Resistance of Coatings Using Water Immersion, 2002, Vol. 6, pp. 1.
- [12] *ASTM 1308-02*, Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes; Vol. 6, pp. 19.