Self-levelling Epoxy Flooring – Case Studies

[Excerpts from Dr. Fixit Case Studies]

1.0 Case study-1

HSM floor of Bhusan Steel Plant at Angul, Odisha was laid with self-levelling epoxy flooring from the Dr. Fixit range of products. The surface was rubbed and grinded to a level and smooth surface (Figs. 1-2). The first coat was with high adhesion epoxy primer of Dr. Fixit Pidipoxy EP, the second coat was with a strong epoxy under lay of Dr. Fixit Pidipoxy Under lay and finished coating was with self-levelling epoxy flooring of 1 mm thick with Dr. Fixit Pidipoxy ESL 1000. The total thickness of the flooring system was 3 mm. The work was carried out with a local applicator in the year 2010. The step by step process of mixing and application of primer, underlay and finished coat are shown in Figs. 3-10.

Fig. 1: Inspection of condition of floor

Fig. 2: Floor grinding

Fig. 3: Mixing of two component primer Dr. Fixit Pidipoxy EP

Fig. 4: Application of Dr. Fixit Pidipoxy EP primer

Fig. 5: Mixing of Dr. Fixit Pidipoxy Underlay-SL

Fig. 6: Application of Dr. Fixit Pidipoxy Underlay-SL

Fig. 7: Application of Dr. Fixit Pidipoxy Underlay-SL

Fig. 8: Mixing of Dr. Fixit Pidipoxy ESL 1000

Fig. 9: Application of finished coat with Dr. Fixit Pidipoxy ESL 1000

Fig. 10: View of self levelling epoxy industrial flooring after installation

2.0 Case study-2

The floor surface of workshop of comprehensive vehicle unit of EME Shilllong, Meghalaya (Fig. 11) had many cracks, oil spillage and deteriorated concrete floor at their repair bay, tool stores, spare stores and machine room (Figs. 12-13). The existing concrete floor was needed to be replaced with seamless, tough and an aesthetic look floor finished modern flooring. Epoxy self-levelling flooring from Dr. Fixit was used to replace the existing concrete floor and flooring was successfully completed, thereafter same specification was recommended for flooring in all their workshops of EME.

Fig. 11: Comprehensive vehicle unit of EME Shilllong

Fig. 12: Cracks in existing floor

The unit repair bay, Tools and stores, Spares Stores and machine rooms were applied with Dr. Fixit Pidiseal 43 for treating concrete joints (Fig. 14), Dr. Fixit Pidipoxy EP as primer, Dr. Fixit Pidipoxy ESL 1000 Epoxy flooring system as finished coat and Dr. Fixit Pidipoxy EC SF for boarders and drawers.

Fig. 13: Debonding of floor surfaces due to wear and tear

Fig. 14: Sealing moving joints for floor with Dr. Fixit Pidiseal 43

The total surface area of the flooring was 900 m^2 and the work was carried out by enlisted contactor in year 2009.

The step by step application from surface preparation to installation of the coating is given in Figs. 15 to 20. The before and after images of self -levelling flooring floor installation of Hoovers spares-blast proof machine room, TSS Confidential room & Workshop Master Bay room are shown in Figs. 21 to 26 respectively.

Fig. 15: Scraping of concrete surface and exposing weak floor concrete substrate

Fig. 16: Priming of floor surface

Fig. 17: Mixing of primer Dr. Fixit Pidipoxy EP

Fig. 18: Application of Dr. Fixit Pidipoxy EP

Fig. 19: Mixing of Dr. Fixit Pidipoxy ESL 1000

Fig. 20: Mechanical Mixing in a container

Fig. 21: Floor of Hoovers spares-blast proof machine room before

Fig. 22: Floor of Hoovers spares-blast proof machine room after self levelling flooring

Fig. 23: Floor of TSS Confidential room before

Fig. 24: Floor of TSS Confidential room after self levelling flooring

Fig. 25: Workshop Master Bay Before

Fig. 26: Workshop Master Bay after self levelling flooring

3.3 Case study-3

Interim test range missile (ITR), Chandipur, Balasore, Odisha of DRDO had laid the antistatic epoxy flooring of Dr. Fixit Antistatic SL. A test was carried out to check the antistatic property of the product after the installation in an area of 140 m^2 in their Tech area of MES in year 2010.

3.3.1 Principle of testing

The electrical resistance of a laid floor covering is measured on the surface between two electrodes. The basic difference between conducting and antistatic flooring is electrical resistivity between these two types of flooring. The resistance of floor surface to earth must be less than 50 x 10^3 Ω in case of conducting floor and should between 50 x 10^3 to 2 x 10^6 Ω in case of antistatic floor when measured with a wet electrode. A warning notice should be displayed on buildings in which anti-static precautions are necessary.

3.3.2 Surface Preparation

The surface of the floor should be cleaned and dried. The application of fullers earth followed by wiping with distilled water is suitable method of cleaning. The same method was was used for the cleaning the surface before the testing.

Preparation of test pieces: The test is carried out at the site after 48 h of laying antistatic flooring.

3.3.3 Equipment required for the test

Tripod Electrode: It is comprising of a triangular aluminium plate with an insulating layer on the upper surface and three cylindrical feet of conductive rubber on the underside at a distance of 180 mm apart. The rubber feet should have a hardness in accordance with ISO 48 of 50 to 70 IRHD (International Rubber Hardness Degrees) and the electrical resistance of each rubber foot should be less than 10^3 Ω when tested between two metals.

Resistance meter: It should be calibrated to determine the resistance R of the floor covering to an accuracy of ± 5% in the range of 10^3 Ω to 10^{10} Ω and an accuracy of ± 10% greater than 10^{10} Ω. For resistance less than 10^6 Ω it should be 500 volts D.C. The resistance meter used in this test is shown in Fig. 27.

Fig. 27: Resistance meter

3.3.4 Testing procedure

Two cleaned tripod electrodes were placed, separated by a distance of 100 mm, on the surface of the dry floor covering. Each of the electrodes was pressed to apply a load of minimum 300 N on the floor covering. This was achieved by using a person's body weight standing on foot on each electrode as shown in Fig. 28.

Fig. 28: Checking antistatic property of self-levelling epoxy flooring

The resistance was measured by a Digital Megger after 10 s to 15 s of switching on of the equipment. The procedure was repeated 15 times after shifting the tripod electrodes. The testing was carried out as per standard procedures given in EN 1081 and test results were found out to be within ranges and the anti-static property of the same flooring could be checked and verified.