# Waterproofing - External Walls of Buildings

[Excerpts from "Waterproofing – External Walls of Buildings" published in NBMCW, April 2014] by Sanjay Bahadur, CEO – Construction Chemicals & Paints, Pidilite Industries, Mumbai]

## 1.0 Significance of Waterproofing

Water leakage, or more categorically moisture ingress in buildings, results in damp, uncomfortable internal environments; deterioration of internal finishes (including mould growth); unsightly damp areas on wall and ceiling surfaces and increased concentrations of harmful pollutants affecting occupant's health. The exclusion of moisture from buildings is therefore not only desirable but also of utmost concern to the residents of the buildings.

## 2.0 Water Seepage through External Walls in Mumbai

In Mumbai, due to heavy rainfall, water seepage through external walls is found to be a common defect faced by house owners. In one of the surveys conducted on about 10,000 private residential units, findings showed that the use of single layer ($4^{1/2}$)" brick wall was the most common cause of water seepage through external walls. Almost 90% of the water seepage occurred through cracks in the plastered brick walls.

In general, water seeps through external walls within the first five years of building completion. The problem is further compounded by Mumbai's high humidity and higher rainfall levels. High wind speeds experienced by high-rise buildings also increases the likelihood of water seepage. Building envelopes must, therefore, be adequately designed and constructed to prevent ingress of water.

## 3.0 General Reasons of Water Seepage through External Walls

- Joints and cracks in the walls
- Absorption and permeation of the materials
- Construction joints in the walls
- Penetrating dampness
- Rising dampness due to capillary action
- Poor construction practices
- Honeycomb structures in concrete or plaster
- Separation gaps

## 4.0 Waterproofing Systems and Materials

Water tightness of external walls is usually achieved by providing adequate wall thickness, proper designing at construction joints and surface rendering and finishes which serve as barrier against water ingress. But normally no attention is paid towards critical areas like separation gaps, honeycomb areas, damp proof courses at plinth level, and so on. This results to serious leakages through external walls and damages to expensive internal paints and finishings.

## 5.0 Significance of External Wall Coating

Use of either cement or general exterior acrylic paint cannot create an impermeable envelope around a building. For effective waterproofing of external walls, the coating material used should function as more protective than decorative. Revolutionary products like Dr. Fixit Raincoat, an elastomeric exterior waterproofing coating composed of high quality acrylic emulsion polymer combined with weather durable pigments, graded fine fillers and additives, work as a barrier to liquid water and carbon dioxide gas; but permeable to water vapour (which makes it breathable). The special properties like accommodation of movement in substrate, bridging existing cracks, maintaining flexibility and strength over a broad temperature range, resisting dirt pick up and fungal/algal growth, and over and above, maintaining these properties for periods of up to 7-10 years, make them very suitable especially for environment like that in Mumbai.

Dr. Fixit Raincoat, an elastomeric exterior waterproofing coating can be applied on all types of exterior masonry surfaces, cement and renderings as well as on asbestos sheets. A list of various systems used to arrest water penetration in the external walls for specific reasons is given below:

| Sr. No. | Reason | Waterproofing system/ Materials |
|---|---|---|
| 1 | Cracks in the walls | Polymer Modified Mortars / Pastes |
| 2 | Joints & Separation gaps | Polymer Modified Mortar and sealants |
| 3 | Penetrating Dampness | Impregnation system |
| 4 | Rising Dampness | Injection system with siliconate materials |
| 5 | Honeycomb structures | Flaring mortars / Crystalline system |
| 6 | Rain water penetration | External Wall Coating |

## 6.0 Conclusion

Considering the life cycle cost analysis, such acrylic elastomeric wall coating is a proven approach to long-term protection of exposed building walls as compared to normal acrylic decorative paints due to its dual properties of "Waterproofing & Crack Bridging".