



It's all about Imagineering

Gaps & Demands in application & practices of construction chemicals at Indian construction sites

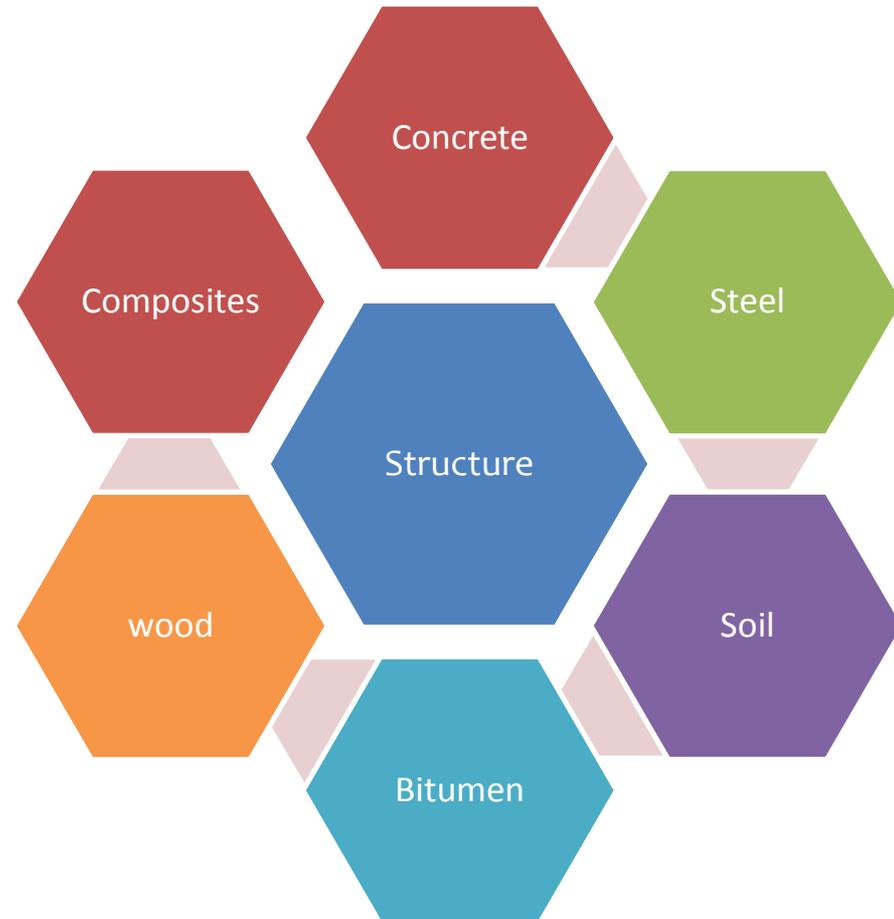
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- CE & SpC domain
- Chemicals in construction of structures
- Trends & success stories
- Today Construction scenario & Challenges
- Future demands
- Summary

CE & SpC domain in construction

1. Since 1930 – more to address ease in construction and provide value addition to Construction industry
2. Mostly organic chemicals are used in all sectors of construction.
3. More than 1000 chemicals are used for various activities of construction



Chemicals in construction of structures

Concrete

Concrete admixtures
Protective coatings
Surface treatments
Grouts
Flooring compounds
Water proofing compounds
Sealants
Adhesives
Foaming agents

Soil & Rock

Lime based stabilizers
Nano stabilizers
Polymers, resins,
hardners to seepage
control
Geo nets, geo synthetics

Bitumen

SBS
Elvoloy (EVA)
Etheylene butyl acrylate (EBA)
Emulsions
Anti stripping agent (amine and
silicone based)
Temp reducers
sulphur

Rebar

Anti corrosive coatings
Epoxy coating
Corrosion inhibitor
cement slurry coatings

Other industrial products

paints
Plaster of paris
EPS
Polymers
Resins
Fillers
Tiles, ceramics,

Greater trends in construction – concrete & Steel

1. No cement concrete
2. Self compacting concrete
3. Pumping concrete against gravity
4. Under water concrete
5. Pumping concrete to a greater height
6. Light weight concrete
7. Epoxy coatings
8. Galvanised coating



Greater trends in construction - Bitumen

1. Rut & fatigue resistance mixes
2. Thermal heat conservative additives in bitumen heating
3. Cold mixes
4. Pot hole mixes



Greater trends in construction – Soil & Rock

1. Alternate to bentonite
2. Weak soil/fissured rock improvement
3. Rehabilitation of foundations suffered under large settlements
4. Seepage in tunnels & rock masses
5. foundation structures exposed to Cl , SO_4 etc.,



Construction environment

Construction challenges are

1. critical sites with poor accessibility
2. foundations are becoming complex
3. buildings are taller, larger and longer
4. Heavily reinforced sections
5. detailing with steel has become cumbersome
6. depleted resources of good raw materials of concrete



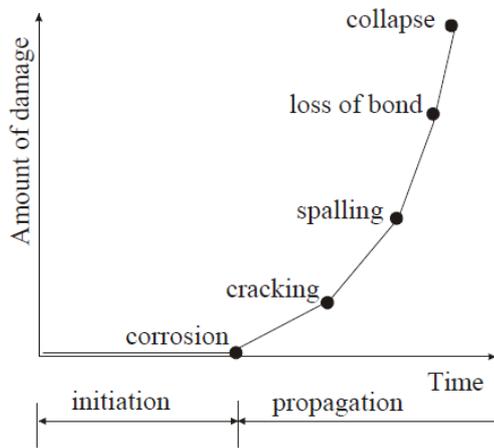
The Pearl Development Project, Qatar

What is the life span of concrete structures? (Residential, Public, Infra structure Buildings)

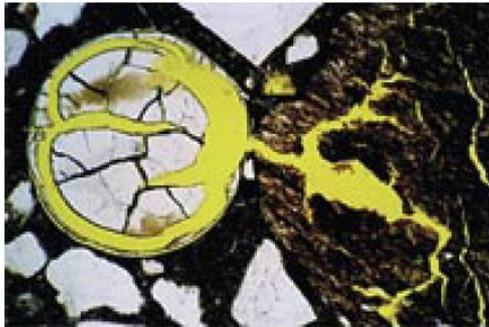


- Severely damaged RCC framed structure due to corrosion
- A Medical Hostel building constructed with faulty concrete materials in 1984
 - Distress with in 25 years

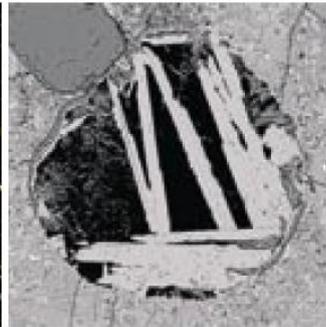
Major distress of construction due to faulty materials



Concrete block with severe cracking caused by DEF and testing of cores by thin section microscopy and residual expansion measurements



Thin section microscopy showing alkali-silica reactive aggregate and gel in air void



Scanning electron microscopy showing ettringite in paste, cracks and voids of concrete exposed to sea water



Future trends

Concrete

Self cleaning admixtures & colour retention
Self curing/healing
Rheology modifiers
Shrinkage reducers
ASR inhibitors
Recycling process
Bacterial concrete

Soil & Rock - foundations

Flyash ponds
Slag dumps
Reclaimed sites
Coastal zones

Bitumen

Rheology modifiers with fillers, Polymers
Thermal heat eco additives
Rejuvenators
Cold mix
Recycling process

Rebar

Anti corrosive coatings
Epoxy coating
Corrosion inhibitor
cement slurry coatings

Other industrial products

Nano paints
Nano performance additives
Extreme climate performance additives
Seepage controllers
Electrical conductivity inhibitors
Vision improving chemicals

SpC to stay focus on

Performance based materials

Eco friendly products – CO₂ control (birth to expiry)

Robust QC/QA controls & training in application

Indian national brand popularisation

Thank you

