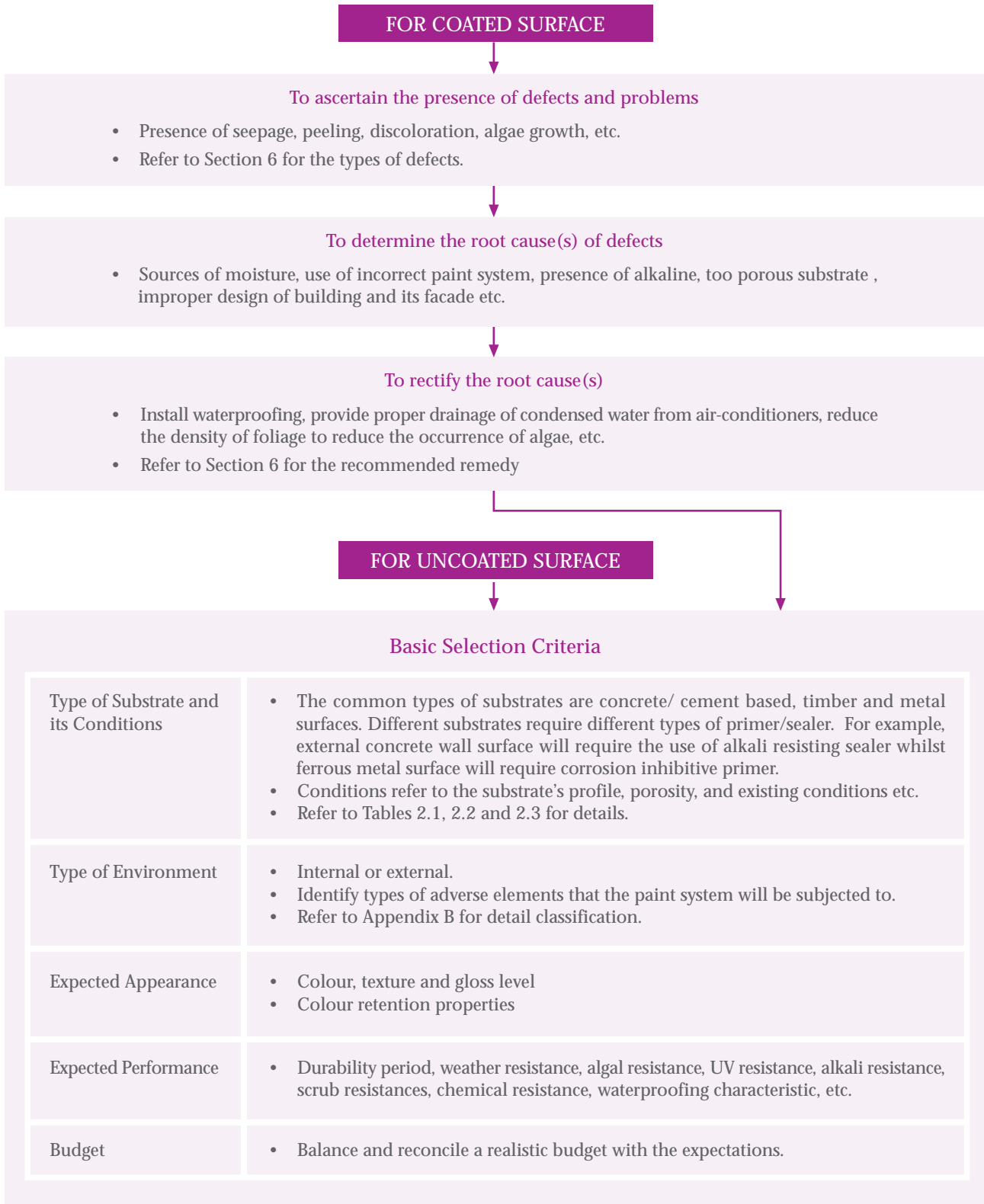


2. Material Selection

2.1 SELECTION OF PAINT SYSTEM

Different types and grades of paint systems have varying application and performance properties. Figure 2.1 summarises the key considerations in determining the existing condition of coated surface as well as in selecting the appropriate paint system.

Figure 2.1: Selection of Paint System



In general, the various paint components used (that is the primer, sealer, intermediate coat and topcoat) should be compatible. Tables 2.1 to 2.3 provide useful information on the various common paint systems available for different surfaces and purposes. The following explanatory notes are for the use of Table 2.1 to 2.3.

Column Headings	Explanatory Notes
Surface	Receiving surfaces are categorised according to the type of base substance of the substrate, i.e. concrete/cement plaster, timber or metal. The surfaces have been further categorised into internal (sheltered) or external environmental exposures.
Finishes	Description is based on the required gloss level or texture.
Comparison of Properties	A 4-point grading scale is used to highlight strengths and weaknesses of the key properties of the system.
Paint Type	Description is based on the resin of topcoat.
Typical Paint System	Description is based on the types of sealer/primer, undercoat and topcoat to be used. Numbers of coat to be applied are also indicated.
Remarks	Brief description on the general applications.



Table 2.1: Reference Chart for Selecting Paint Systems for CONCRETE/PLASTER SURFACE

S/No	Surface	Finishes Required	Comparison of Properties				Paint Type	Typical Paint System	No. of Coats	Remarks
			Ease in Painting	Durability	Anti-Algae and Fungus	Alkaline Resistance				
INTERNAL										
M1		Matt	A	C	C	C	ACRYLIC COPOLYMER EMULSION	Alkali resisting sealer Acrylic emulsion SS150 (Type 2)	1 2	Quality matt emulsion. Lasting for most internal walls.
M2	Cement plastered walls and concrete related surfaces, brickwork, plaster boards, gypsum boards, ceiling panels	Sheen	A	B	B	C	VEOVA (MODIFIED ACRYLIC) EMULSION	Alkali resisting sealer "Vinyl Silk" emulsion	1 2	Luxurious sheen emulsion that gives a smooth and silky appearance. Premium grade for interior decor commonly sold as Vinyl Silk emulsion.
M3		Low Sheen	A	A	B	B	ACRYLIC EMULSION	Alkali resisting sealer Acrylic emulsion	1 2	Premium grade with superb washable surface properties
M4	As above and all floor excluding gypsum types	Low Gloss/ Gloss	C	A	A	A	EPOXY	Epoxy sealer Epoxy topcoat	1 2	Excellent chemical resistance and very good hardness & abrasion resistance. Resist defect by moisture. Used in food, chemical or heavy duty environment.
EXTERNAL										
M5	Cement plastered walls and concrete related surfaces, brickwork, mineral plasters	Matt	A	C	C	B	ACRYLIC EMULSION	Alkali resisting sealer Acrylic emulsion SS150 (Type 1)	1 2	Good weathering and alkali resistance.

Table 2.1: Reference Chart for Selecting Paint Systems for CONCRETE/PLASTER SURFACE

S/No	Surface	Finishes Required	Comparison of Properties				Paint Type	Typical Paint System	No. of Coats	Remarks
			Ease in Painting	Durability	Anti-Algae and Fungus	Alkaline Resistance				
EXTERNAL (cont'd)										
M6		Semi-Gloss	B	B	B	B	B	Alkali resisting solvent-based sealer Acrylic solvent-based topcoat	1 2	Excellent thermoplastic coatings for fungus/algae prone surfaces. Excellent adhesion and good durability to weather.
M7	Cement plastered walls and concrete related surfaces, brickwork, mineral plasters	Low Sheen	A	B	A	A	A	Alkali resisting sealer High performance acrylic emulsion SS 345	1 2	High quality Acrylic emulsion with anti algae/fungi properties
M8		Gloss	C	A	A	A	A	Epoxy primer Polyurethane topcoat	1 2	Excellent weather, chemical and abrasion resistance two-components paint system
M9		Sheen	A	B	B	A	B	Alkali resisting sealer Texture base coat High performance acrylic emulsion SS345	1 1 2	Textured acrylic-based, decorative finish with algistatic, fungistatic & anti-carbonation properties
M10		Gloss/ Semi-Gloss	B	B	B	A	B	Alkali resisting solvent-based sealer Texture base coat Acrylic solvent-based finishing coat	1 1 2	Textured acrylic solvent-based coating with excellent adhesion

Table 2.1: Reference Chart for Selecting Paint Systems for CONCRETE/PLASTER SURFACE

S/No	Surface	Finishes Required	Comparison of Properties				Paint Type	Typical Paint System	No. of Coats	Remarks
			Ease in Painting	Durability	Anti-Algae and Fungus	Alkaline Resistance				
EXTERNAL (cont'd)										
M11	Cement plastered walls and concrete related surfaces, brickwork, mineral plasters	Gloss	B	A	A	A	A	1	Acrylic & 2-pack polyurethane combination textured system. Excellent weather, chemical and abrasion resistance	
		Matt	A	B	B	A	B	2		
M12	Fair-face brick wall	Natural	A	C	C	B	C	1-2	Protection from external stains and treatment to moisture absorption problem. Water repelling, fungus and weather resistance.	
		Natural	A	B	B	B	C	2	Acrylic solvent-based coatings for fungus/algae prone concrete and roof tiles.	

Grading for Comparison of Properties

LEGEND: A Excellent B Very Good C Good D Average

Notes:

- All external systems are suitable for internal use.
- Resin level differs for paint types specified here. For resin and toxicity levels in paint, refer to manufacturers.
- All systems specified are for general painting purpose. Variation is subjected to site conditions or circumstances.
- For elastomeric coatings, please refer to SS 500:2002 - Elastomeric wall coatings for more information.
- For surfaces not covered here, refer to manufacturers.

Table 2.2: Reference Chart for Selecting Paint Systems for **TIMBER SURFACES**

S/No	Surface	Finishes Required	Comparison of Properties				Paint Type	Typical Paint System	No. of Coats	Remarks
			Ease in Painting	Durability	Hardness	Yellowing Resistance				
INTERNAL										
T1		Gloss	B	D	D	D	ALKYD RESIN ENAMEL	Aluminium wood primer SS 38 Alkyd enamel undercoat SS 34 Alkyd enamel gloss top coat SS 7	1 1 2	High gloss enamel for painting of general doors & windows
T2	All kinds of timber products or related material	Gloss	D	A	B	A	2-PACK POLYURETHANE	Epoxy primer Polyurethane topcoat	1 2	Glossy, hard and solvent resistant and non-yellowing two-components paint system.
T3		Sheen	A	D	D	C	VEOVA MODIFIED (MODIFIED ACRYLIC) EMULSION	Aluminium wood primer SS 38 Alkyd enamel undercoat SS 34 "Vinyl Silk" emulsion	1 1 2	Decorative emulsion for panels & ceiling trims. Commonly sold as Vinyl Silk Emulsion
T4		Gloss & Satin	D	D	B	A	ACRYLIC MODIFIED ALKYD NITRO-CELLULOSE (NC) LACQUER	NC acrylic lacquer	3	Aerosol spray for easy application on furniture



Table 2.2: Reference Chart for Selecting Paint Systems for **TIMBER SURFACES**

S/No	Surface	Finishes Required	Comparison of Properties				Paint Type	Typical Paint System	No. of Coats	Remarks
			Ease in Painting	Durability	Hardness	Yellowing Resistance				
INTERNAL (cont'd)										
T5		Natural	B	C	C	C	ALKYD MODIFIED POLYURETHANE 1-PACK	1-pack polyurethane clear	3	Very durable varnish for furniture, wood panels and doors.
T6	All kinds of timber products or related material	Natural	C	B	A	B	2-PACK POLYURETHANE	2-pack polyurethane clear	3	Hard coating for furniture and wood panels
T7		Natural	C	B	A	C	2-PACK AMINO-ALKYD RESIN ACID CURE	Amino-alkyd coating clear	3	Very tough coating for parquet floors, railing or furniture
T8		Natural	C	B	A	C	2-PACK EPOXY	Epoxy clear	3	Chemical-resistant coating for corrosive environment, e.g. Laboratory benches.
EXTERNAL										
T9	All kinds of timber products or related material	Gloss	B	D	D	D	ALKYD RESIN ENAMEL	Aluminium wood primer SS38	1	High gloss enamel for painting of general doors & windows.
								Alkyd enamel undercoat SS 34	1	
								Alkyd enamel gloss top coat SS 7	2	

material selection

Table 2.2: Reference Chart for Selecting Paint Systems for **TIMBER SURFACES**

S/No	Surface	Finishes Required	Comparison of Properties				Paint Type	Typical Paint System	No. of Coats	Remarks
			Ease in Painting	Durability	Hardness	Yellowing Resistance				
EXTERNAL (cont'd)										
T10		Gloss	D	A	B	A	2-PACK POLYURETHANE	Epoxy primer Polyurethane finishing coat	1 2	Chemical-resistant coating for corrosive environment, e.g. Laboratory benches.
T11	All kinds of timber products or related material	Low Sheen	A	D	C	B	ACRYLIC EMULSION	Aluminium wood primer SS38 Alkyd enamel undercoat SS34 Acrylic emulsion	1 1 2	Exterior grade emulsions under special requirement
T12		Natural	D	A	B	A	2-PACK POLYURETHANE	Polyurethane clear	3	Very durable coat for external timber structures.

Grading for Comparison of Properties

LEGEND: A Excellent B Very Good C Good D Average

Notes:

- 1 All external systems are suitable for internal use.
- 2 Resin level differs for paint types specified here. For resin and toxicity levels in paint, refer to manufacturers.
- 3 All systems specified are for general painting purpose. Variation is subjected to site conditions or circumstances.
- 4 For surfaces not covered here, refer to manufacturers.

Table 2.3: Reference Chart for Selecting Paint Systems for METAL SURFACES

S/No	Surface	Finishes Required	Comparison of Properties				Paint Type	Typical Paint System	No. of Coats	Remarks
			Ease in Painting	Durability	Hardness	Corrosion control				
INTERNAL										
F1		Gloss	A	C	D	C	ALKYD RESIN ENAMEL	Alkyd-based anti-corrosion primer* Alkyd enamel undercoat SS 34 Alkyd enamel gloss topcoat SS7	1 1 2	*Refer to SS494 for Lead and chromate-free primer Easy to use finishing coat over primed metal surfaces under non-corrosive environment.
F2	(Ferrous type) Iron & steel related surfaces	Low Gloss/ Gloss	C	A	A	A	EPOXY	Epoxy/Zinc phosphate blast primer Epoxy topcoat	1 2	Epoxy system for corrosive chemical environment on blasted metal.
F3		Low Gloss/ Gloss	C	A	A	A	EPOXY	2-pack high solid epoxy primer Epoxy topcoat	1 2	High-build epoxy system for corrosive chemical environment and NO GRIT BLAST situation.
F4		Low Gloss/ Gloss	C	A	A	A	EPOXY	Epoxy coating	3	Epoxy system. 'Non Toxic' suitable for potable tanks. Relevant certification should be obtained before use

-
-
-
-
-
-
-
-
-
-
-
-

material selection

Table 2.3: Reference Chart for Selecting Paint Systems for METAL SURFACES

S/No	Surface	Finishes Required	Comparison of Properties				Paint Type	Typical Paint System	No. of Coats	Remarks
			Ease in Painting	Durability	Hardness	Corrosion control				
INTERNAL (cont'd)										
F5	(Non ferrous type) Galvanised metal, stainless steel, copper, tin & other related surfaces	Gloss	A	C	D	C	ALKYD RESIN ENAMEL	Etching primer Alkyd-based anti-corrosion primer* Alkyd enamel undercoat SS34 Alkyd enamel gloss topcoat SS7	1 1 1 2	*Refer to SS494 for Lead and chromate-free primer Easy to use finishing system over properly primed surfaces. Under non-corrosive environment, e.g. domestic home & commercial office.
F6		Low Gloss/ Gloss	C	A	A	A	EPOXY	Epoxy primer Epoxy topcoat	1 2	Heavy-duty epoxy system for corrosive environment such as chemical industry.
EXTERNAL										
F7	(Ferrous type) Iron & steel related surfaces	Gloss	A	D	D	C	ALKYD RESIN ENAMEL	Alkyd-based anti-corrosion primer* Alkyd enamel undercoat SS34 Alkyd enamel gloss topcoat SS7	1 1 2	*Refer to SS494 for Lead and chromate-free primer Easy to use system for non-corrosive environment, e.g. residential and commercial areas.

Table 2.3: Reference Chart for Selecting Paint Systems for METAL SURFACES

S/No	Surface	Finishes Required	Comparison of Properties			Paint Type	Typical Paint System	No. of Coats	Remarks
			Ease in Painting	Durability	Hardness				
EXTERNAL (cont'd)									
F8		Gloss	B	C	B	B	Alkyd-based anti-corrosion primer* Alkyd-based micaceous iron oxide Alkyd enamel gloss topcoat SS7	1 2 2	*Refer to SS494 for Lead and chromate-free primer Modified alkyd & micaceous iron oxide offering protection in mildly corrosive & highly humid condition, e.g. towers, bridges, heavy structural steel works.
F9	(Ferrous type) Iron & steel related surfaces	Gloss	C/B	A	B/A	B/A	Epoxy/ zinc phosphate blast primer 2-pack polyurethane finishing coat	1 2	High performance Epoxy/ Polyurethane system for highly corrosive environment on blasted metal e.g. exposed to sea salt or highly corrosive chemicals.
F10		Gloss	C/B	A	B/A	B/A	2-pack high solid epoxy primer Epoxy built-coat 2-pack polyurethane finishing coat	1 1 2	Epoxy/ Polyurethane system for highly corrosive environment and NO GRIT BLAST situation.
F11		Sheen	C	C	C	B	Ethyl silicate zinc rich primer Coal tar epoxy topcoat	1 3	Heavy duty Coal Tar system for long-term or periodic immersion in sea water.

-
-
-
-
-
-
-
-
-
-
-
-

material selection

Table 2.3: Reference Chart for Selecting Paint Systems for METAL SURFACES

S/No	Surface	Finishes Required	Comparison of Properties			Paint Type	Typical Paint System	No. of Coats	Remarks	
			Ease in Painting	Durability	Hardness					Corrosion control
EXTERNAL (cont'd)										
F12	(Non-ferrous type) Galvanised metal, stainless steel, copper, tin & other related alloy surfaces	Gloss	A	D	D	C	ALKYD RESIN ENAMEL	Etching primer Alkyd-based anti-corrosion primer* Alkyd enamel undercoat Alkyd enamel gloss topcoat	1 1 1 2	*Refer to SS494 for Lead and chromate-free primer Alkyd resin enamel for non-corrosive environment e.g. residential, office & light industries.
F13			A	C	C	B	ALKYD MEDIUM-OIL TYPE	Etching primer Alkyd-based anti-corrosion primer* Medium-oil alkyd topcoat gloss	1 1 2	*Refer to SS494 for Lead and chromate-free primer Use in mild corrosive atmosphere e.g. industrial chimney, mild chemical processing plant
F14			C	A	A	A	EPOXY/POLYURETHANE	Etching primer Epoxy primer 2-pack polyurethane gloss finishing coat	1 1 2	Heavy-duty Epoxy/Polyurethane system. Excellent in corrosive chemicals conditions e.g. chemical industry, exposed to salted seawater.

Grading for Comparison of Properties

LEGEND: A Excellent B Very Good C Good D Average

Notes:

- All external systems are suitable for internal use.
- Resin level differs for paint types specified here. For resin and toxicity levels in paint, refer to manufacturers.
- All systems specified are for general painting purpose. Variation is subjected to site conditions or circumstances.
- For surfaces not covered here, refer to manufacturers.