

Examples of Paints classified by Resin & some of their General Properties

Appendix A

		WATER-BASED						SOLVENT-BASED					
Resin Classification	Principal Ingredient	Acrylic	VA/Acrylic Copolymer	PVA Copolymer	Epoxy (2-pack)	Polyurethane	Alkyd	Acrylic	Epoxy (2-pack)	Polyurethane	Fluorocarbon		
Main Usage		Methyl methacrylate modified Acrylic	Vinyl Acetate Copolymer	Polyvinyl Acetate Copolymer	Epoxy resin + amine, polyamide resin	Polyurethane resin	Oil-modified phthalic acid resin	Methyl methacrylate modified Acrylic	Epoxy resin + amine, polyamide resin	Polyurethane resin	Polyvinylidene Fluoride		
		General Cementitious-based Surface	Internal Cementitious/ Gypsum Surface	Internal Cementitious/ Gypsum Surface	Internal Chemical Environment	Chemical Environment	General steel frames, wooden surfaces	General Cementitious-based Surface	Internal Chemical Environment	Chemical Environment	Aluminium cladding and extrusions		
Durability of paint	Chalk resistance	○	△	□	□	⊙	○	○	□	⊙	⊙		
	Water resistance	○	△	□	⊙	○	□	○	⊙	○	⊙		
	Acid proof	○	□	△	⊙	○	□	○	⊙	○	⊙		
	Alkali proof	○	□	x	⊙	⊙	x	○	⊙	⊙	⊙		
Classification of receiving object	Residential	○	○	○	⊙	⊙	○	○	⊙	⊙	⊙		
	Industrial area	○	□	x	⊙	⊙	□	○	⊙	⊙	⊙		
	Seaside	○	□	x	⊙	⊙	□	○	⊙	⊙	⊙		
	Water dip	○	x	x	⊙	○	x	○	⊙	○	⊙		
Classification of receiving object	Salt water dip	□	x	x	⊙	○	x	□	⊙	○	⊙		
	High humidity	○	△	□	⊙	⊙	△	□	⊙	⊙	⊙		
	Comosion resistance	○	□	x	⊙	○	△	○	⊙	○	⊙		
	Ease in Painting	⊙	⊙	⊙	○	○	⊙	⊙	○	○	○		
Suitability to receiving object	Iron	○	△	△	○	○	○	○	○	○	○		
	Wood	○	△	△	○	○	○	○	○	○	○		
	Concrete	○	△	△	○	○	x	○	○	○	NA		

**Legend** ⊙ - Very Good ○ - Good △ - Fair □ - Average x - Poor NA - Not Applicable



Categories of Environment according to their Corrosive Nature

Appendix B

Characteristic	Description	Recommended Paint Type based on the Resin Family	
		Water-Based	Solvent-Based
<b>INTERNAL</b>			
Highly-Corrosive	<ul style="list-style-type: none"> <li>Chemical storage facilities.</li> <li>Factory exposed to constant acidic fumes or structures immersed in water.</li> <li>Chemical factory using acidic and other aggressive materials in its process.</li> </ul>	Epoxy (2-pack) Polyurethane (2-pack)	Epoxy (2-pack) Fluorocarbon Polyurethane (2-pack) Silicone (2-pack)
Corrosive	<ul style="list-style-type: none"> <li>Factory exposed to mild acid, alkaline, heat and high humidity.</li> </ul>	Epoxy (2-pack) Polyurethane (2-pack)	Epoxy (2-pack) Fluorocarbon Polyurethane (2-pack) Silicone (2-pack)
Mildly-Corrosive	<ul style="list-style-type: none"> <li>Light industries with mild corrosive environment.</li> </ul>	Epoxy (2-pack) Polyurethane (2-pack) Acrylic Silicone	Epoxy (2-pack) Fluorocarbon Polyurethane (2-pack) Acrylic
Non-Corrosive	<ul style="list-style-type: none"> <li>Residential and commercial complexes with no moisture condensation and chemicals exposure.</li> </ul> 	Epoxy (2-pack) Polyurethane (2-pack) Silicone Acrylic	Epoxy (2-pack) Fluorocarbon Polyurethane (2-pack) Acrylic Alkyd

Categories of Environment according to their Corrosive Nature

Appendix B

Characteristic	Description	Recommended Paint Type based on the Resin Family	
		Water-Based	Solvent-Based
<b>EXTERNAL</b>			
Highly-Corrosive	<ul style="list-style-type: none"> <li>Structures immersed in sea.</li> <li>Structures exposed to constant sunlight or industries with polluting fumes.</li> <li>Structures exposed to high humidity e.g. oils refineries.</li> </ul>	Polyurethane (2-pack)	Fluorocarbon Polyurethane (2-pack) Silicone (2-pack)
	<ul style="list-style-type: none"> <li>Structures near to sea.</li> <li>Structures exposed to Industrial pollutants with several chimneys e.g. power stations, heavy industrial complexes.</li> </ul>	Polyurethane (2-pack) Acrylic	Fluorocarbon Polyurethane (2-pack) Silicone (2-pack) Acrylic
	<ul style="list-style-type: none"> <li>Commercial areas with high-traffic density or industrial estates with fumes-emitting outlets</li> </ul>	Polyurethane (2-pack) Acrylic Silicone	Fluorocarbon Polyurethane (2-pack) Acrylic
Non-Corrosive	<ul style="list-style-type: none"> <li>Residential and Inland surroundings.</li> </ul>	Acrylic Silicone	Fluorocarbon Polyurethane (2-pack) Acrylic

Note: Examples of main corrosive components are SO<sub>2</sub>, CO<sub>2</sub>, NO<sub>x</sub>, Cl<sub>2</sub> and industrial dust. Moisture will aid and accelerate chemical activity.



Laboratory Tests on Paint System

Appendix C

Adulteration						Dilution	
EXTERNAL	Purpose	Emulsion-based	Enamel-based	Others	Method	Purpose	
Accelerated weathering	Colour change/fastness Loss of gloss Physical change on paint film	✓	✓		In compliance with SS5	Ensure specified paint film thickness and integrity	
Algae resistance	Resistance to micro-biological attack	✓					
Wet scrub abrasion	Film durability	✓					
Non- volatile matter	Compliance to specification	✓	✓	✓			
Drying time	Compliance to specification		✓	✓			
Adhesion	Compliance to specification		✓	✓			
Colour comparison	Compliance to specification	✓	✓	✓			
Impact	Compliance to specification			✓			
Hardness	Compliance to specification		✓	✓			

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



Sample of Inspection and Test Plan

Project:

Scope of Work: Painting

S/No	Activity	People-In-Charge	Inspection Method	Requirement Reference	Acceptance Criteria	Stages	Records
<b>1</b>	<b>SUBMISSION</b>						
1.1	Paint Type	AP/SE/A/O	Review	Section 4.1	Approved	Initial	Approved submissions
1.2	Technical Data	AP/SE/A	Review	-	Approved	Initial	Approved submissions
1.3	Surface Preparation Method	AP/SE/A	Review	Section 4.2	Approved	Initial	Approved submissions
1.4	Method Statement	AP/SE/A	Review	-	Approved	Initial	Approved submissions
1.5	Working Programme	AP/SE/A/O	Review	-	Approved	Initial	Approved submissions

**2 INCOMING MATERIALS INSPECTION**

2.1	Check Shelf Life	AP/S/COW	Visual	Section 3.1	Conform to manufacturer's data sheet	Each delivery	Delivery document
2.2	Check Colour	AP/S/COW	Visual	Section 3.1	As per approved samples	Each delivery	Delivery document

**3 IN-PROCESS INSPECTION**

3.1	Check Environmental Conditions	AP/S/COW	Visual/Measure	Section 5.1	Conform to manufacturer's data sheet	Before coating	Appendix E
3.2	Confirm Location of Application	AP/S/COW	Visual	Section 4.1	Conform to approved submission	Before coating	Appendix E
3.3	Confirm Surface Preparation Method	AP/S/COW	Visual	Section 4.2	Conform to approved submission	Before coating	Appendix E
3.4	Confirm Number of Coats	AP/S/COW	Visual	Section 2.1/4.1	Conform to approved submission	Before coating	Appendix E
3.5	Confirm Name (Type) of Coats	AP/S/COW	Visual	Section 2.1/4.1	Conform to approved submission	Before coating	Appendix E

Prepared by \_\_\_\_\_  
Date \_\_\_\_\_

Verified by \_\_\_\_\_  
Date \_\_\_\_\_

Approved by \_\_\_\_\_  
Date \_\_\_\_\_

**LEGEND**

AP – Applicator	S – Site Supervisor	SE – Site Engineer	COW – Clerk of Work	O – Owner	A – Architect
-----------------	---------------------	--------------------	---------------------	-----------	---------------

## Sample of Inspection and Test Plan (cont'd)

Project:

Scope of Work: Painting

S/No	Activity	People-In-Charge	Inspection Method	Requirement Reference	Acceptance Criteria	Stages	Records
<b>3 IN-PROCESS INSPECTION (cont'd)</b>							
3.6	Confirm Method of Application	AP/S/COW	Visual	Section 5.3	Conform to approved submission	Before Coating	Appendix E
3.7	Check Substrate	AP/S/COW	Visual/Measure	Section 4.2	Surface clean, stable and dry Smoothness and flatness of substrate Surface temperature	Before Coating	Appendix E
3.8	Check Protection Works	AP/S/COW	Visual	Section 4.4	Protect adjacent elements (not to be painted)	Before Coating	Appendix E
3.9	Check Safety	AP/S/COW	Visual	Section 4.5	Wear proper working attire, footwear, helmet & safety belt Use protective materials (mask, glasses) where necessary Erect proper access such as scaffold	Before Coating	Appendix E
3.10	Check Paint Mix	AP/S/COW	Visual	Section 4.3	Conform to manufacturers' data sheet	Before Coating	Appendix E
3.11	Check Application Tools	AP/S/COW	Measure	Section 5.2	Conform to approved submission	Before Coating	Appendix E
3.12	Check Painting	AP/S/COW	Visual/Measure	Section 5.5	Conform to manufacturers' data sheet	Before/ During Coating	Appendix E
3.13	Test Site Sample (Random)	AP/S/COW	Visual/Lab Test	Section 3.1/ Appendix C	Conform to specification	Before/ During Coating	Appendix E
<b>4 FINAL INSPECTION</b>							
4.1	Check Protection Work	AP/S/COW	Visual	Section 5.4	Protect completed work	At Completion	Appendix F
4.2	Work Acceptance	AP/S/COW	Visual/Measure	Section 5.5	Conform to specification and approved submission	At Completion	Appendix F
Prepared by _____		Verified by _____		Approved by _____			
Date _____		Date _____		Date _____			

**LEGEND** AP – Applicator

S – Site Supervisor

SE – Site Engineer

COW – Clerk of Work

O – Owner

A – Architect

Sample Checklist for In-Process Inspection on Painting Work  
(Concrete/Plaster Surface)

Appendix E

Project: \_\_\_\_\_

Location: \_\_\_\_\_

Checklist	Requirement Reference	Inspection		
		Date	Result	Sign
<p><b>Surface Preparation</b></p> <p>1. Fresh surface cured for 21 days (applicable to new coating only)</p> <p>2. Moisture level &lt; 6% or refer to manufacturers' recommendations</p> <p>3. Surface free from algae or fungus growth</p> <p>4. Surface free from unstable matters</p> <p>5. Surface free from grease or oil</p> <p>6. Exposed surface primed</p> <p>7. Substrate hairline cracks</p> <p>8. Type of stopper or filler used for deep holes or shallow depressions</p>	<p>Table 4.1</p> <p>Table 4.1</p> <p>Table 4.1</p> <p>Table 4.1</p> <p>Table 4.1</p> <p>Table 4.1</p> <p>Table 4.1</p> <p>Table 4.1</p>			
<p><b>Paint Preparation</b></p> <p>9. Name, colour and type of paint</p> <p>10. Thinning ratio</p> <p>11. Mix ratio</p> <p>12. Pot-life</p>	<p>Section 4.3</p> <p>Section 4.3</p> <p>Section 4.3</p> <p>Section 4.3</p>			
<p><b>Painting Environment</b></p> <p>13. Surrounding temperature &gt; 5°C or refer to manufacturers' recommendations</p> <p>14. No strong wind</p> <p>15. Environment free from dust or pollutants</p> <p>16. Relative humidity</p> <p>17. Adequate ventilation</p> <p>18. Adequate lighting</p>	<p>Section 5.1</p> <p>Section 5.1</p> <p>Section 5.1</p> <p>Section 5.1</p> <p>Section 4.5</p> <p>Section 4.5</p>			
<p><b>Paint Application</b></p> <p>19. No. of coats and location of application</p> <p>20. Adjacent elements (not to be painted) are protected</p> <p>21. Proper working attire, footwear, and helmet are worn</p> <p>22. Proper gloves, protective masks or glasses are worn (where necessary)</p> <p>23. Safety belts and proper accesses are provided</p> <p>24. Surface clean and dry</p> <p>25. Surface temperature</p> <p>26. Appropriate application tools are used</p> <p>27. Painting frequency</p> <p>28. Painting interval</p> <p>29. Drying time</p> <p>30. Lab Test Submission</p>	<p>Section 4.1</p> <p>Section 4.4</p> <p>Section 4.5</p> <p>Section 4.5</p> <p>Section 4.5</p> <p>Section 4.2</p> <p>Section 5.1</p> <p>Section 5.2</p> <p>Section 5.1</p> <p>Section 5.1</p> <p>Section 5.1</p> <p>Section 5.1</p> <p>Section 3.1/ Appendix C</p>			
<p><b>Final</b></p> <p>30. Protect completed painting works</p>	<p>Section 5.4</p>			
<p>Prepared by _____ Date _____</p>	<p>Verified by _____ Date _____</p>	<p>Approved by _____ Date _____</p>		



# Sample Checklist for In-Process Inspection on Painting Work (Timber Surface)

Project: \_\_\_\_\_

Location: \_\_\_\_\_

Checklist	Requirement Reference	Inspection		
		Date	Result	Sign
<b>Surface Preparation</b> 1. Moisture level < 15% or refer to manufacturers' recommendation 2. Surface free from algae or fungus growth 3. Surface free from unstable matters 4. Exposed surface primed 5. Substrate imperfections 6. Type of stopper or filler used for deep holes or shallow depressions	Table 4.2 Table 4.2 Table 4.2 Table 4.2 Table 4.2 Table 4.2			
<b>Paint Preparation</b> 7. Name, colour and type of paint 8. Thinning ratio 9. Mix ratio 10. Pot-life	Section 4.3 Section 4.3 Section 4.3 Section 4.3			
<b>Painting Environment</b> 11. Surrounding temperature > 5°C or refer to manufacturers' recommendations 12. No strong wind 13. Environment free from dust or pollutants 14. Relative humidity 15. Adequate ventilation 16. Adequate lighting	Section 5.1 Section 5.1 Section 5.1 Section 5.1 Section 4.5 Section 4.5			
<b>Paint Application</b> 17. No. of coats and location of application 18. Adjacent elements (not to be painted) are protected 19. Proper gloves, protective masks or glasses are worn (where necessary) 20. Proper working attire, footwear and helmet are worn 21. Safety belts and proper accesses are provided 22. Surface clean and dry 23. Surface temperature 24. Appropriate application tools are used 25. Painting frequency 26. Painting interval 27. Drying time 28. Lab Test Submission	Section 4.1 Section 4.4 Section 4.5 Section 4.5 Section 4.5 Section 4.2 Section 5.1 Section 5.2 Section 5.1 Section 5.1 Section 5.1 Section 3.1/ Appendix C			
<b>Final</b> 29. Protect completed painting works	Section 5.4			
Prepared by _____ Date _____	Verified by _____ Date _____	Approved by _____ Date _____		

appendix E

# Sample Checklist for In-Process Inspection on Painting Work (Metal Surface)

Project: \_\_\_\_\_

Location: \_\_\_\_\_

Checklist	Requirement Reference	Inspection		
		Date	Result	Sign
<b>Surface Preparation</b> 1. Surface free from rust 2. Surface free from unstable matters 3. Surface free from grease or oil 4. Exposed surface primed	Table 4.3 & 4.4 Table 4.3 & 4.4 Table 4.3 & 4.4 Table 4.3 & 4.4			
<b>Paint Preparation</b> 5. Name, colour and type of paint 6. Thinning ratio 7. Mix ratio 8. Pot-life	Section 4.3 Section 4.3 Section 4.3 Section 4.3			
<b>Painting Environment</b> 9. Surrounding temperature > 5°C or refer to manufacturers' recommendations 10. No strong wind 11. Environment free from dust or pollutants 12. Relative humidity 13. Adequate ventilation 14. Adequate lighting	Section 5.1 Section 5.1 Section 5.1 Section 5.1 Section 4.5 Section 4.5			
<b>Paint Application</b> 15. No. of coats and location of application 16. Adjacent elements (not to be painted) are protected 17. Proper working attire, footwear and helmet are worn 18. Proper glove and protective masks or glasses are worn (where necessary) 19. Safety belts and proper accesses are provided 20. Surface clean and dry 21. Surface temperature 22. Appropriate application tools are used 23. Painting frequency 24. Painting interval 25. Drying time 26. Lab. Test submission	Section 4.1 Section 4.4 Section 4.5 Section 4.5 Section 4.5 Section 4.2 Section 5.1 Section 5.2 Section 5.1 Section 5.1 Section 5.1 Section 3.1/ Appendix C			
<b>Final</b> 30. Protect completed painting works	Section 5.4			
Prepared by _____ Date _____	Verified by _____ Date _____	Approved by _____ Date _____		



