



REPORT FOR COATING SYSTEMS

- GRANTING OF APPROVAL
 RENEWAL (P-.....)
 REPETITION (P-.....)

COMPANY

NAME: KCC Corporation,Ltd.....
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COUNTRY: South Korea.....
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SYSTEM

FULL DESIGNATION: KARUMEL DS1350 gloss
QUALICOAT CODE¹:
TYPE² 1 1d 1s 2a 2b 2c 2d 2e
GLOSS CATEGORY 1 2 3
CLASS 1 1.5 2 3
STRUCTURED FINISH³ a b c NO

APPLICATION: QUALICOAT QUALIDECO

SAMPLING:

Date: 21.02.2019

During routine inspection at the coating plants
Directly at the system supplier's premises
Sent by the supplier to the laboratory

LABORATORY:

Laboratory in charge of preparing the samples: IFO China.....
Laboratory in charge of testing: IFO China.....
Contact person: Derek Ding.....
Approval number of the alternative pretreatment used: A-002.....
Date of application: 20.03.2019.....
Curing temperature: 200°C.....
Curing time: 15min.....

¹ Code given by QUALICOAT to the laboratory

² **COATING TYPES:** 1) Powder coating 1d) Two coat organic coating 1s) for sublimation only 2) Liquid coating 2a) Two-coat PVDF 2b) Three-coat PVDF (metallic) 2c) Silicon polyester without primer 2d) Other thermosetting paints 2e) Two-component paints

³ Structured finishes: a) Leathered b) Textured c) Wrinkled



TESTS <i>Specified minimum thickness: 60 µm</i>		COLOURS TESTED			
		RAL 3005.....	RAL 5010.....	RAL 9010.....	RAL
RAL compliance (Delta E referring to standard 841GL)		2.91	4.50	1.32	
1. Gloss (ISO 2813)	Cat. 1 <input type="checkbox"/>	m.v.⁴	m.v.	m.v.	m.v.
	Cat. 2 <input type="checkbox"/>	100µm	69µm	69µm	.....µm
	Cat. 3 <input checked="" type="checkbox"/>	91	83	94	.....
2. Thickness (ISO 2360)		100 µm	69 µm	69 µm	.....µm
3. Adhesion Dry adhesion (ISO 2409) <i>spacing of cutters: 1 mm up to 60 µm; 2 mm above</i> <i>Acceptable value: 0</i>		77µm 0 <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	76µm 0 <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	83µm 0 <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	.....µm <input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory
Wet adhesion (Specs. 2.4.2) <i>No detachment of blistering</i>		77µm 0 <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	76µm 0 <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	83µm 0 <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	.....µm <input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory
4. Indentation (ISO 2815) <i>minimum value: 80</i>		100µm 125 <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	69µm 143 <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	69µm 167 <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	.....µm <input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory
5. Cupping (ISO 1520) <i>No detachment at a diameter of 5 mm</i> <i>Class 1 : no cracking or detachment at a depth of 5 mm</i> <i>Class 1.5, 2 and 3: no detachment at a depth of 5 mm after tape test</i>		67µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	59µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	64µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	.....µm <input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory
6. Bend test (ISO 1519) <i>No detachment at a diameter of 5 mm</i> <i>Class 1 : no cracking or detachment at a diameter of 5 mm</i> <i>Class 1.5, 2 and 3: no detachment at a diameter of 5 mm after tape test</i>		67µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	59µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	64µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	.....µm <input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory
7. Impact test (ISO 6272-1 or 2/ ASTM D 2794) <i>No detachment at 2.5 Nm</i> <i>Class 1 : no cracking or detachment at 2.5 Nm</i> <i>Class 1.5, 2 and 3: no detachment at a 2.5 Nm after tape test</i>		58µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	65µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	59µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	.....µm <input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory
8. Resistance to humid atmospheres containing sulphur dioxide (ISO 3231) <i>No infiltration exceeding 1 mm on both sides of the scratch, and no change in colour or blistering in excess of 2 (S2)</i>		110µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	89µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	71µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	.....µm <input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory
9. Acetic acid salt spray (ISO 9227) <i>Section 2.10 of Specifications</i> <i>Length of filaments: max 4 mm</i> <i>Infiltration: max 16 mm²/10 cm</i> <i>No blistering in excess of 2 (S2)</i>		89µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	79µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	96µm <input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	.....µm <input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory

⁴ m.v.= measured value



TESTS <i>Specified minimum thickness: 60 µm</i>	COLOURS TESTED							
	RAL 3005		RAL 5010.....		RAL 9010		RAL	
	m.v.		m.v.		m.v.		m.v.	
	Initial gloss	Final gloss	Initial gloss	Final gloss	Initial gloss	Final gloss	Initial gloss	Final gloss
10. Accelerated weathering (ISO 16474-2) Gloss retention ≥ 50% class 1 ≥ 75% class 1.5 ≥ 90% class 2 Tests in triplicate for: - Granting an approval (all classes except class 3) - Renewing an approval (only for class 2 powder coatings and for banned colours)	88	72	82	64	92	90		
	89	68	82	64	93	89		
	89	71	82	63	93	89		
	Gloss retention		Gloss retention		Gloss retention		Gloss retention	
	81%		78%		98%	 %	
	76%		78%		96%	 %	
	80%		77%		96%	 %	
	<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	
Colour variation Delta E Class 1: see appendix A7 Class 1.5: 75% of the limits prescribed for class 1 Class 2: 50% of the limits prescribed for class 1 Tests in triplicate for: - Granting an approval (all classes except class 3) - Renewing an approval (only for class 2 powder coatings and for banned colours)	Spec. ΔE	Meas. ΔE	Spec. ΔE	Meas. ΔE	Spec. ΔE	Meas. ΔE	Spec. ΔE	Meas. ΔE
		1.42		0.98		0.93		
	4	0.83	4	0.92	2	0.96		
		0.79		0.89		0.96		
	<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory	
11. Resistance to boiling water <i>Method used: 1) Boiling water 2) Pressure cooker</i> <i>No defects, no detachment</i>	77µm		76µm		83µm		..... µm	
<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		
12. Constant climate condensation water (ISO 6270-2) <i>No infiltration exceeding 1 mm on both sides of the scratch</i> <i>No blistering in excess of 2 (S2)</i>	81µm		71µm		91µm		..... µm	
<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		
13. Polymerisation (for liquid coating only)	..... µm		..... µm		..... µm		..... µm	
<input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		
14. Resistance to mortar (EN 12206-1) <i>No defects</i> <i>No colour change</i> <i>No residues of mortar</i>	77µm		62µm		80µm		..... µm	
<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input checked="" type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		<input type="checkbox"/> satisfactory <input type="checkbox"/> not satisfactory		
15. Water spot test⁵ <i>Colour change: delta L less than 4</i>	Meas.		Meas.		Meas.		Meas.	
	97µm		49µm		91µm		.....µm	
	ΔE	ΔL	ΔE	ΔL	ΔE	ΔL	ΔE	ΔL
	3.83	1.83	2.36	2.13	0.37	-0.08		

⁵ The implementation of this test will be experimental in 2018 and 2019 and any unsatisfactory results will be disregarded during this period.



TESTS <i>Specified minimum thickness: 60 µm</i>	COLOURS TESTED			
	RAL 3005.....	RAL 5010	RAL 9010.....	RAL
	m.v.	m.v.	m.v.	m.v.
16. Weathering test <i>1 year of exposure in Florida (class 1)</i> <i>2 years of exposure in Florida (class 1.5)</i> <i>3 years of exposure in Florida (class 2)</i>	Exposure period (Florida test): SERIES YEARS: 2020 / 2021			

Laboratory (signature)

Date: 27/05/2019

General licensee's recommendation to QUALICOAT

Result satisfactory

Result unsatisfactory (specify)

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Enclosures:

Date:27/05/2019

Signature: