Technical Report

Paint Testing - Lucas Finish Ultimate - Gloss

For

Lucas UK Group Ltd

Work Carried Out By

J.Gadd / T.Glazier

Group Leader

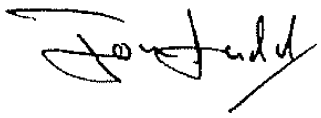
Peter Collins

PRA Ref: 09-186f

19 October 2017

Global Surface Coatings Covered

Analysis Report

PRA Ref. Number	09-186f
Date Received	16 November 2009
Date Issued	19 October 2017
Client	Lucas UK Group Ltd 11 Invicta Business Park London Road Wrotham Kent TN15 7RJ FAO: D.Lucas
Work Requested	Paint Testing – Lucas Finish Ultimate - Gloss
Samples Submitted	Coated Panels and Liquid Paint Sample
Work Carried out by	 …… J.Gadd
Approved by	 …… D.Corrigan Authorised Signatory

1 Materials Submitted For Testing

Galvanised steel panels coated with Lucas Finish Ultimate – Gloss as follows.

3 off 150 x 75mm
2 off 150 x 100mm

Glasroc building board panels coated with Lucas Finish Ultimate – Gloss as follows

9 off 885 x 267 x 13mm thick
5 off 225 x 225 x 13 mm thick

250 ml of Lucas Finish Ultimate – Gloss liquid paint.

2 Test Procedure

2.1 Scrub Resistance

The liquid paint was applied to a black plastic panel and aged for 28 days at before testing the scrub resistance in accordance with BS EN ISO 11998. The weight loss in g/m² after 200 scrub cycles was determined and used to calculate the loss in film thickness. The loss in film thickness was then used to classify the coating in accordance with EN 13300

2.2 Pull Off Adhesion

A pull off adhesion testing in accordance with BS EN ISO 4624 was carried out on the 150 x 100mm galvanised panels.

2.3 Bend Test

A conical mandrel bend test for flexibility was carried out in accordance with BS EN ISO 6860 after the QUV weathering test.

2.4 QUV Weathering

The samples were exposed to 1000 hours artificial weathering in accordance with BS EN ISO 11507 in a QUV weatherometer using UVA340 lamps and operating a continuously cycling test program of 4 hours UV at 60°C and 4 hours condensation at 50°C. Colour measurements in accordance with BS ISO 7724-2 and 60° gloss measurements in accordance with BS EN ISO 2813 were carried out before and after the test. The total colour change as a result of the weathering was expressed in delta E units.

2.5 Surface Spread of Flame and Fire Propagation Testing

The coated Glasroc panels were sent to an associated laboratory (Exova Warringtonfire) for testing in accordance with BS 476 Part 7 - Surface Spread of Flame and BS 476 Part 6 - Fire Propagation Index to demonstrate compliance with Class 0.

3 Results and Observations

3.1 Scrub Resistance

Lucas Finish Ultimate – Gloss		
Weight Loss After 200 Scrub Cycles (g/m^2)	Film Thickness Loss (µm)	EN 13300 Class
1.1	0.7	1

3.2 Pull Off Adhesion

Lucas Finish Ultimate – Gloss		
Test	Pull Off Strength (MPa)	Failure Mode
1	2.879	100% adhesive coating/substrate.
2	6.058	50% adhesive coating/substrate, 50% cohesive in coating layer.
3	2.480	95% adhesive coating/substrate, 5% cohesive in coating layer.
4	5.520	50% adhesive coating/substrate, 50% cohesive in coating layer.
5	6.457	70% adhesive coating/substrate, 30% cohesive in coating layer.
6	5.386	80% adhesive coating/substrate, 20% cohesive in coating layer.

3.3 Bend Test

Lucas Finish Ultimate – Gloss	
Test	Extent of Cracking
After QUV weathering	No cracking observed

3.4 QUV Weathering

Lucas Finish Ultimate – Gloss			
Sample	Exposure (hrs)	60° Gloss	Visual Assessment After Test
1	0	58.6	Loss of gloss
	1000	18.5	
2	0	50.0	Loss of gloss
	1000	19.4	
3	0	64.8	Loss of gloss
	1000	25.6	

Lucas Finish Ultimate – Gloss – Colour Change on Weathering					
Sample	Exposure (hrs)	L	a	b	Total Colour Change (Delta E)
1	0	95.460	-1.030	0.343	
	1000	95.046	-1.007	0.243	0.426
2	0	94.311	-1.164	-0.308	
	1000	94.058	-1.141	-0.420	0.278
3	0	95.282	-1.058	0.248	
	1000	95.008	-1.040	0.315	0.283

3.5 Surface Spread of Flame and Fire Propagation Tests

Test	BS 476 Part 7 Surface Spread of Flame	BS 476 Part Fire Propagation
Lucas Finish Ultimate – Gloss	Class 1	First Index - 2.3 Second Index – 0.7 Third Index – 0.1 Total Index Performance - 3.1
Exova Warringtonfire Report Number	189310	189309
The product complies with the requirements of Class 0		

4 Conclusions

The product has very good scrub resistance.

The colour and gloss changes are moderately low and the product remains flexible after 1000 hours QUV weathering.

The product has very good adhesion to galvanized surfaces

The product meets the requirements of Class 0 (limited combustibility) as defined by the Building Regulations Approved Document B:

End of Report.

Technical Report

Paint Testing - Lucas Finish Ultimate - Satin

For

Lucas UK Group Ltd

Work Carried Out By

J.Gadd / T.Glazier

Group Leader

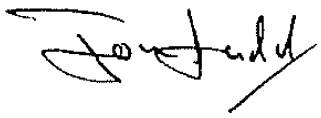
Peter Collins

PRA Ref: 09-186e

19 October 2017

Global Surface Coatings Covered

Analysis Report

PRA Ref. Number	09-186e
Date Received	16 November 2009
Date Issued	19 October 2017
Client	Lucas UK Group Ltd 11 Invicta Business Park London Road Wrotham Kent TN15 7RJ FAO: D.Lucas
Work Requested	Paint Testing – Lucas Finish Ultimate - Satin
Samples Submitted	Coated Panels and Liquid Paint Sample
Work Carried out by	 …… J.Gadd
Approved by	 …… D.Corrigan Authorised Signatory

1 Materials Submitted For Testing

Galvanised steel panels coated with Lucas Finish Ultimate – Satin as follows.

3 off 150 x 75mm
2 off 150 x 100mm

Glasroc building board panels coated with Lucas Finish Ultimate – Satin as follows

9 off 885 x 267 x 13mm thick
5 off 225 x 225 x 13 mm thick

250 ml of Lucas Finish Ultimate – Satin liquid paint.

2 Test Procedure

2.1 Scrub Resistance

The liquid paint was applied to a black plastic panel and aged for 28 days at before testing the scrub resistance in accordance with BS EN ISO 11998. The weight loss in g/m² after 200 scrub cycles was determined and used to calculate the loss in film thickness. The loss in film thickness was then used to classify the coating in accordance with EN 13300

2.2 Pull Off Adhesion

A pull off adhesion testing in accordance with BS EN ISO 4624 was carried out on the 150 x 100mm galvanised panels.

2.3 Bend Test

A conical mandrel bend test for flexibility was carried out in accordance with BS EN ISO 6860 after the QUV weathering test.

2.4 QUV Weathering

The samples were exposed to 1000 hours artificial weathering in accordance with BS EN ISO 11507 in a QUV weatherometer using UVA340 lamps and operating a continuously cycling test program of 4 hours UV at 60°C and 4 hours condensation at 50°C. Colour measurements in accordance with BS ISO 7724-2 and 60° gloss measurements in accordance with BS EN ISO 2813 were carried out before and after the test. The total colour change as a result of the weathering was expressed in delta E units.

2.5 Surface Spread of Flame and Fire Propagation Testing

The coated Glasroc panels were sent to an associated laboratory (Exova Warringtonfire) for testing in accordance with BS 476 Part 7 - Surface Spread of Flame and BS 476 Part 6 - Fire Propagation Index to demonstrate compliance with Class 0.

3 Results and Observations

3.1 Scrub Resistance

Lucas Finish Ultimate – Satin		
Weight Loss After 200 Scrub Cycles (g/m^2)	Film Thickness Loss (µm)	EN 13300 Class
2.0	1.2	1

3.2 Pull Off Adhesion

Lucas Finish Ultimate – Satin		
Test	Pull Off Strength (MPa)	Failure Mode
1	5.327	30% adhesive coating/substrate, 70% cohesive in coating layer.
2	5.149	50% adhesive coating/substrate, 50% cohesive in coating layer.
3	5.223	85% adhesive coating/substrate, 15% cohesive in coating layer.
4	4.927	50% adhesive coating/substrate, 50% cohesive in coating layer.
5	4.721	50% adhesive coating/substrate, 50% cohesive in coating layer.
6	4.339	60% adhesive coating/substrate, 40% cohesive in coating layer.

3.3 Bend Test

Lucas Finish Ultimate – Satin	
Test	Extent of Cracking
After QUV weathering	No cracking observed

3.4 QUV Weathering

Lucas Finish Ultimate – Satin			
Sample	Exposure (hrs)	60° Gloss	Visual Assessment After Test
1	0	20.3	Slight loss of gloss
	1000	8.9	
2	0	21.4	Slight loss of gloss
	1000	9.1	
3	0	19.9	Slight loss of gloss
	1000	8.2	

Lucas Finish Ultimate – Satin – Colour Change on Weathering					
Sample	Exposure (hrs)	L	a	b	Total Colour Change (Delta E)
1	0	95.226	-1.042	0.579	
	1000	94.922	-1.056	1.554	1.021
2	0	94.665	-1.085	0.249	
	1000	94.525	-1.043	0.255	0.146
3	0	94.931	-1.081	0.374	
	1000	94.218	-1.198	1.354	1.218

3.5 Surface Spread of Flame and Fire Propagation Tests

Test	BS 476 Part 7 Surface Spread of Flame	BS 476 Part Fire Propagation
Lucas Finish Ultimate – Satin	Class 1	First Index - 3.0 Second Index – 0.6 Third Index – 0.2 Total Index Performance - 3.8
Exova Warringtonfire Report Number	189312	189308
The product complies with the requirements of Class 0		

4 Conclusions

The product has very good scrub resistance.

The colour and gloss changes are moderately low and the product remains flexible after 1000 hours QUV weathering.

The product has very good adhesion to galvanized surfaces

The product meets the requirements of Class 0 (limited combustibility) as defined by the Building Regulations Approved Document B:

End of Report

Technical Report

Paint Testing - Lucas Finish Ultimate - Matt

For

Lucas UK Group Ltd

Work Carried Out By

J.Gadd / T.Glazier

Group Leader

Peter Collins

PRA Ref: 09-186g

19 October 2017

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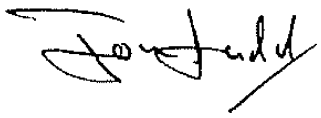
Date Issued	19 October 2017
Client	Lucas UK Group Ltd 11 Invicta Business Park London Road Wrotham Kent TN15 7RJ FAO: D.Lucas
Work Requested	Paint Testing – Lucas Finish Ultimate - Matt
Samples Submitted	Coated Panels and Liquid Paint Sample
Work Carried out by	 …… J.Gadd
Approved by	 …… D.Corrigan Authorised Signatory

1 Materials Submitted For Testing

Galvanised steel panels coated with Lucas Finish Ultimate – Matt as follows.

3 off 150 x 75mm
2 off 150 x 100mm

Glasroc building board panels coated with Lucas Finish Ultimate – Matt as follows

9 off 885 x 267 x 13mm thick
5 off 225 x 225 x 13 mm thick

250 ml of Lucas Finish Ultimate – Matt liquid paint.

2 Test Procedure

2.1 Scrub Resistance

The liquid paint was applied to a black plastic panel and aged for 28 days at before testing the scrub resistance in accordance with BS EN ISO 11998. The weight loss in g/m² after 200 scrub cycles was determined and used to calculate the loss in film thickness. The loss in film thickness was then used to classify the coating in accordance with EN 13300

2.2 Pull Off Adhesion

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2.3 Bend Test

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2.4 QUV Weathering

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2.5 Surface Spread of Flame and Fire Propagation Testing

The coated Glasroc panels were sent to an associated laboratory (Exova Warringtonfire) for testing in accordance with BS 476 Part 7 - Surface Spread of Flame and BS 476 Part 6 - Fire Propagation Index to demonstrate compliance with Class 0.

3 Results and Observations

3.1 Scrub Resistance

Lucas Finish Ultimate – Matt		
Weight Loss After 200 Scrub Cycles (g/m^2)	Film Thickness Loss (µm)	EN 13300 Class
5.6	2.4	1

3.2 Pull Off Adhesion

Lucas Finish Ultimate – Matt		
Test	Pull Off Strength (MPa)	Failure Mode
1	1.621	100% adhesive coating/substrate.
2	1.495	95% adhesive coating/substrate, 5% cohesive in the coating layer.
3	1.626	95% adhesive coating/substrate, 5% cohesive in the coating layer.
4	1.664	95% adhesive coating/substrate, 5% cohesive in the coating layer.
5	1.568	95% adhesive coating/substrate, 5% cohesive in the coating layer.
6	1.528	90% adhesive coating/substrate, 10% cohesive in the coating layer.

3.3 Bend Test

Lucas Finish Ultimate – Matt	
Test	Extent of Cracking
After QUV weathering	No cracking observed

3.4 QUV Weathering

Lucas Finish Ultimate – Matt			
Sample	Exposure (hrs)	60° Gloss	Visual Assessment After Test
1	0	2.8	No apparent change
	1000	2.5	
2	0	2.8	No apparent change
	1000	2.5	
3	0	2.8	No apparent change
	1000	2.5	

Lucas Finish Ultimate – Matt – Colour Change on Weathering					
Sample	Exposure (hrs)	L	a	b	Total Colour Change (Delta E)
1	0	96.462	-0.906	0.879	
	1000	96.132	-0.882	0.859	0.331
2	0	96.814	-0.909	0.923	
	1000	96.551	-0.868	0.922	0.266
3	0	96.472	-0.925	0.805	
	1000	96.168	-0.958	1.562	0.816

3.5 Surface Spread of Flame and Fire Propagation Tests

Test	BS 476 Part 7 Surface Spread of Flame	BS 476 Part Fire Propagation
Lucas Finish Ultimate – Matt	Class 1	First Index - 2.7 Second Index – 0.7 Third Index – 0.1 Total Index Performance - 3.5
Exova Warringtonfire Report Number	189311	189307
The product complies with the requirements of Class 0		

4 Conclusions

The product has very good scrub resistance.

The colour and gloss changes are moderately low and the product remains flexible after 1000 hours QUV weathering.

The product has very good adhesion to galvanized surfaces

The product meets the requirements of Class 0 (limited combustibility) as defined by the Building Regulations Approved Document B:

End of Report.