

Henkel Technology-Centre

Test Report Lab- A76ACF-RLAR

1. Customer

Fa. Crystal Doors

2. Contact Person Henkel

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and Sales
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Jürgen Lotz
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3. Task to be performed

WSF Fira and Dorus

Test Date: 02.03.2016

Examiner: Lauter Rudolf
Henkel Technology Center (HTC)

5. Test material

Type of adhesive • AQUENCE FD 150/6	Kind of adhesive • Henkel
Carrier material • MDF	Manufacturer ?
Substrate • ?	Manufacturer • Kydex
Manufactured in Henkel Technology Centre • no	Original parts from customer • yes

6. Test methods

▪ Henkel®-method, heat resistance of 3D-parts	(Henkel®-test method 963)
▪ FIRA-method, heat resistance of 3D-parts	(Henkel®-test method 959)
▪ AMK-method, heat resistance of 3D-parts	(Henkel®-test method 961)
▪ Long term stability	(Henkel®-test method)

7. Henkel® judging criteria (German school grading system)

RATING	SIGNIFICANCE
5	No spontaneous delamination, will not peel
4	No spontaneous delamination, peels with difficulty
3	No spontaneous delamination, peels with ease
2	Some spontaneous delamination
1	Complete spontaneous delamination

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8. Test results

Foil manufacturer:		Foil material:		Foil thickness:		
?		?		0,7		
Adhesive:		Press system:		Edge temperature achieved:		
AQUENCE FD 150/6		Wemhöner		?		
Adhesion :		Immediately		After 7 days		
Edge		?		5		
Surface				100%		
Heat resistance						
Henkel test Edge: 80°C			Inner radius: -----			
Henkel®-test method 963						
Increasing heat resistance. Starting at 50°C/5°C per h until 100°C, afterwards 12 hrs at 100°C.						
Maximum foil shrinkage 0,3 mm						
Henkel®-test method 959: FIRA-method, Annex D						
Increasing heat resistance. Each 3 days 40 °C / 50 °C / 60 °C.						
FIRA passed with maximum foil shrinkage 0,25 mm at 60°C						
Henkel®-test method 961: AMK-method						
Increasing heat resistance. 1 h at 50 °C / 1 h at 60 °C / 4 h at 75 °C.						
Maximum foil shrinkage 0,2mm at 75°C						
Henkel®-test method: Long term stability						
Conditions: 12 h 40 °C 40% air humidity / 12 h 40 °C 80% air humidity						
Keyword evaluation:						
Part: 1 WSF Henkel and Fira Adhesive: AQUENCE FD 150/6 Foil: Kydex red						
Method						
Henkel®	Foil shrinking (mm)	FIRA Annex D	Foil shrinking (mm)	AMK	Foil shrinking (mm)	Long term Stability – 100 days Conditions: 12 h 40 °C 40% air humidity 12 h 40 °C 80% air humidity
		40 °C	0			
50 °C	0	50 °C	0	50 °C		
55 °C	0					
60 °C	0	60 °C	0	60 °C		
65 °C	0	65°C	0,1			
70 °C	0,1	70°C	0,3			
75 °C	0,1			75 °C (4 h)		
80 °C	0,3					
85 °C	0,6					
90 °C	1,5					
95 °C	2					
100 °C	2,5					
100 °C (12 h)	6					
Remarks:						

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Heat resistance according to FIRA BS 6222, part 3 : 1999, Annex C

ADHESION PERFORMANCE

The submitted samples were tested for adhesion according to the method described in BS 6222 Domestic Kitchen Equipment Part 3:1999 Performance requirements for durability of surface finish and adhesion of surfacing and edging materials-Specification: Clause 8/8.3 Performance of other surfaces.

TEST PROCEDURE SUMMARY

The samples were exposed for 84±12 hr at 40°C in a dry air circulating oven. After this exposure period the bonds were examined and a given a performance rating the significance of which is described in Table 1. The temperature of the oven was raised in 10°C steps up to 60°C temperature for 84±12 hr.

TABLE 1

RATING	SIGNIFICANCE
5	No spontaneous delamination, will not peel
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1	Complete spontaneous delamination

TECHNICAL REPORT FIRA BS 6222, part 3 : 1999, Annex C					
Sample 1	Bond Type	Performance Rating			
		As Received	40°C	50°C	60°C
Foil : Kydex red AQUENCE FD 150/6 Press : Wemhöner	Surface	5	5	5	5
	Edge 1	5	5	5	5
	Edge 2	5	5	5	5
	Edge 3	5	5	5	5
	Edge 4 *	-----	-----	-----	-----
	Rout	5	5	5	5
STATUS	Pass	No delamination			

* edge 4 :

Front was cut in 2 parts to measure heat resistance according to FIRA and Henkel test method

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8. Test results

Foil manufacturer:		Foil material:		Foil thickness:		
?		?		?		
Adhesive:		Press system:	Edge temperature achieved:	Sample to be tested:		
AQUENCE FD 150/6		Wemhöner	?	Without Innerradius		
Adhesion :		Immediately	After 7 days	Spraying:		
Edge		?	5	?		
Surface			100%			
Heat resistance						
Henkel test Edge: 80°C			Inner radius: -----			
Henkel®-test method 963						
Increasing heat resistance. Starting at 50°C/5°C per h until 100°C, afterwards 12 hrs at 100°C.						
Maximum foil shrinkage 0,3 mm						
Henkel®-test method 959: FIRA-method, Annex D						
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FIRA passed with maximum foil shrinkage 0,25 mm at 60°C						
Henkel®-test method 961: AMK-method						
Increasing heat resistance. 1 h at 50 °C / 1 h at 60 °C / 4 h at 75 °C.						
Maximum foil shrinkage 0,2mm at 75°C						
Henkel®-test method: Long term stability						
Conditions: 12 h 40 °C 40% air humidity / 12 h 40 °C 80% air humidity						
Keyword evaluation:						
Part: 2 WSF Henkel and Fira Adhesive: AQUENCE FD 150/6 Foil: Kydex Purple						
Method						
Henkel®	Foil shrinking (mm)	FIRA Annex D	Foil shrinking (mm)	AMK	Foil shrinking (mm)	Long term Stability – 100 days Conditions: 12 h 40 °C 40% air humidity 12 h 40 °C 80% air humidity
		40 °C	0			
50 °C	0	50 °C	0	50 °C		
55 °C	0					
60 °C	0	60 °C	0	60 °C		
65 °C	0	65°C	0,1			
70 °C	0,1	70°C	0,3			
75 °C	0,1			75 °C (4 h)		
80 °C	0,2					
85 °C	0,5					
90 °C	1,6					
95 °C	2,2					
100 °C	3					
100 °C (12 h)	5,5					
Remarks:						

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Heat resistance according to FIRA BS 6222, part 3 : 1999, Annex C

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TECHNICAL REPORT FIRA BS 6222, part 3 : 1999, Annex C					
Sample 2	Bond Type	Performance Rating			
		As Received	40°C	50°C	60°C
Foil : Purple AQUENCE FD 150/6 Press : Wemhöner	Surface	5	5	5	5
	Edge 1	5	5	5	5
	Edge 2	5	5	5	5
	Edge 3	5	5	5	5
	Edge 4 *	-----	-----	-----	-----
	Rout	5	5	5	5
STATUS	Pass	No delamination			

* edge 4 :

Front was cut in 2 parts to measure heat resistance according to FIRA and Henkel test method

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8. Test results

Foil manufacturer:		Foil material:		Foil thickness:		
?		?		?		
Adhesive:		Press system:	Edge temperature achieved:	Sample to be tested:		
AQUENCE FD 150/6		Wemhöner	?	Without Innerradius		
Adhesion :		Immediately	After 7 days	Spraying:		
Edge		?	5	?		
Surface			100%			
Heat resistance						
Henkel test Edge: 80°C			Inner radius: -----			
Henkel®-test method 963 Increasing heat resistance. Starting at 50°C/5°C per h until 100°C, afterwards 12 hrs at 100°C. Maximum foil shrinkage 0,3 mm						
Henkel®-test method 959: FIRA-method, Annex D Increasing heat resistance. Each 3 days 40 °C / 50 °C / 60 °C. FIRA passed with maximum foil shrinkage 0,25 mm at 60°C						
Henkel®-test method 961: AMK-method Increasing heat resistance. 1 h at 50 °C / 1 h at 60 °C / 4 h at 75 °C. Maximum foil shrinkage 0,2mm at 75°C						
Henkel®-test method: Long term stability Conditions: 12 h 40 °C 40% air humidity / 12 h 40 °C 80% air humidity						
Keyword evaluation:						
Part: 3 WSF Henkel and Fira Adhesive: AQUENCE FD 150/6 Foil: Kydex Purple						
Method						
Henkel®	Foil shrinking (mm)	FIRA Annex D	Foil shrinking (mm)	AMK	Foil shrinking (mm)	Long term Stability – 100 days Conditions: 12 h 40 °C 40% air humidity 12 h 40 °C 80% air humidity
		40 °C	0			
50 °C	0	50 °C	0	50 °C		
55 °C	0					
60 °C	0	60 °C	0	60 °C		
65 °C	0	65°C	0,1			
70 °C	0,1	70°C	0,3			
75 °C	0,2			75 °C (4 h)		
80 °C	0,3					
85 °C	0,4					
90 °C	1					
95 °C	1,8					
100 °C	2,3					
100 °C (12 h)	7					
Remarks:						

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TECHNICAL REPORT FIRA BS 6222, part 3 : 1999, Annex C					
Sample 3	Bond Type	Performance Rating			
		As Received	40°C	50°C	60°C
Foil : Purple AQUENCE FD 150/6 Press : Wemhöner	Surface	5	5	5	5
	Edge 1	5	5	5	5
	Edge 2	5	5	5	5
	Edge 3	5	5	5	5
	Edge 4 *	-----	-----	-----	-----
	Rout	5	5	5	5
STATUS	Pass	No delamination			

* edge 4 :

Front was cutted in 2 parts to measure heat resistance according to FIRA and Henkel test method.

Evaluation

- The parts which have been sent by the customer were produced with AQUENCE FD 150/6 on Wemhöner press. Those 3 parts show good adhesion on the edges. The heat resistance of 80°C is not optimal
- Based on own tests in Henkel Technology Center - the Kydex foil is not primed on the back, which we consider as one of the main reason for the not sufficient results. The adhesive is not able to build up a good adhesion to the foil.

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Therefore, we see big risk to produce stabile and good quality 3D fronts.

Costs arisen at our DTC: 940 €

The above mentioned indications, especially the proposal regarding processing and using of our products, are based on our knowledge and experiences. We recommend to do own trials, because of the various materials and your working conditions which cannot be influenced, in order to find the proper adhesive type for your demands. WE do not accept liability for the indications or a verbal advice, unless negligence or intention is...