Resistance Test Results Thermo-Jet®

Test, Testing Medium Evaluation:	Thermo-Jet® 312 Red			Thermo-Jet® 948 Black			according to DIN	Test-parameter	Temp.
Printing substrate	**SKF (a)**	**Rigid PVC (b)**	**PMMA (c)**	**SKF (a)**	**Rigid PVC (b)**	**PMMA (c)**			
Fastness to saliva	++	++	++	++	++	++	53160-1	2 h	37 °C / 99 °F
Fastness to perspiration	++	++	++	++	++	++	53160-2	2 h	37 °C / 99 °F
Water resistance:							ISO 2836	24 h	20 °C / 68 °F
Visible change of ink film	++	++	++	++	++	++			
Coloring of testing medium	++	++	++	++	++	++			
Solvent resistance:							ISO 2836	5 min	20 °C / 68 °F
– Ethanol Visible change of ink film	++	++	++	++	++	++			
Coloring of testing medium	++	++	++	++	++	++			
– Test mixture **(d)** Visible change of ink film	≈ (f)	≈ (f)	– (e,f)	≈ (f)	≈ (f)	– (e,f)			
Coloring of testing medium	++	++	++	++	++	++			
Fuel resistance:							ISO 2836	5 min	20 °C / 68 °F
– Premium Visible change of ink film	+ (g)	++	++	+ (g,h)	+ (h)	+ (h)			
Coloring of testing medium	++	++	++	++	++	++			
– Regular gas Visible change of ink film	+	++	++	+	++	++			
Coloring of testing medium	++	++	++	++	++	++			
– Diesel Visible change of ink film	++	++	++	++	++	++			
Coloring of testing medium	++	++	++	++	++	++			
Alkali resistance: – 2.5 % NaOH-solution							ISO 2836	10 min	20 °C / 68 °F
Visible change of ink film	++	++	++	++	++	++			
Coloring of testing medium	++	++	++	++	++	++			
Detergent resistance: – 1 % Persil®-solution							ISO 2836	3 h	20 °C / 68 °F
Visible change of ink film	++	++	++	++	++	++			
Coloring of testing medium	++	++	++	++	++	++			
Resistance to vegetable fat: – Sunflower oil							ISO 2836	24 h	20 °C / 68 °F
Visible change of ink film	++	++	++	++	++	++			
Coloring of testing medium	++	++	++	++	++	++			
Resistance to skin cream: – Nivea®								24 h	20 °C / 68 °F
Visible change of ink film	++	++	++	++	++	++			
Coloring of testing medium	++	++	++	++	++	++			
Conditioning cabinet (95 % humidity)			++			++		5 h	80 °C / 176 °F
Heat resistance	++	+ (i)		++	+ (i)			30 min	120 °C / 248 °F
Scrub resistance **(j)**	++	+ P		++	+ P/S			200 shears	
Level of gloss **(k)**	**70**	**73**	**74**	**69**	**75**	**74**			
Acid resistance: – sulfuric acid, δ = 1.24 g/ml								5 min	20 °C / 68 °F
Visible change of ink film	++	++	++	++	++	++			
Cross-hatch adhesion test **(l)**		Gt 0	Gt 0		Gt 0	Gt 0	ISO 2409		

Thinning:
20 % Thinner M 204

Printing conditions:
Mesh 120-34 Y
Squeegee 70 Shore A

Remarks:

- **++** good, no color-change
- **+** acceptable
- **≈** poor
- **–** not recommended, resp. coloration
- **S** scratches
- **P** polishing

Printing substrates:

- **(a)** PVC self-adhesive film white, glossy Type: Jac 72100
- **(b)** Rigid PVC white Type: Genotherm FE 85 Manufacturer: Hoechst/Kalle
- **(c)** Plexiglas® GS Manufacturer: Evonik Röhm GmbH
- **(d)** Test mixture according to DIN ISO 2836 30 % by volume ethyl acetate 60 % by volume ethanol 10 % by volume 1-methoxy-propanol-2
- **(e)** Substrate material not resistant
- **(f)** Ink film redissolved, after drying scratch resistant again, gloss reduction
- **(g)** Slight blistering in the substrate material
- **(h)** Slight gloss reduction
- **(i)** Slight substrate material deformation
- **(j)** Quartant Scrub-Tester, Manufacturer: Prüfbau Company
- **(k)** micro-gloss, geometry 60°, Manufacturer: Byk Gardner average value of 5 measurements
- **(l)** Cross-hatch adhesion value

Proell GmbH · P.O. Box 4 29 · D-91773 Weissenburg i. Bay. · Germany
Phone: +49 9141 906-0 · Fax +49 9141 906-49 · info@proell.de · www.proell.de

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