

# TEST REPORT

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**Subject** : Testing of Dalmia Skim Coat Premium (Prepacked Skimcoat) as requested by Dalmia Cement (Bharat) Ltd on 22/06/2016

**Tested for** : **Dalmia Cement (Bharat) Ltd**  
11<sup>th</sup> & 12<sup>th</sup> Floor  
Hansalaya Building  
15 Barakhamba Road  
New Delhi 110001  
India  
Attn: Dr. Surjit Ghosh

**Method of test** : 1. Water Retentivity : BS 4551: 2005+A2:2013  
2. Setting Time : BS EN 196: Part 3:1995 +A1: 2008: Annex A  
3. Compressive Strength : BS EN 1015-11:1999  
4. Linear Shrinkage at 28 days : ASTM C531:2000 (Reapproved 2012)  
5. Tensile Adhesion Strength : BS EN 1015-12: 2000

**Specification** : BS EN 998-1:2003

**Description of sample** : One bag of Dalmia Skim Coat Premium (Prepacked Skimcoat) weighing approximately 40kg was received.



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**1. Preparation of Concrete substrates for Tensile Pull off Adhesion Strength Test**

- Concrete substrates for pull off test** :
- 1) The mixing procedure for the concrete mixes were carried out in accordance with BS EN 480-1:2014
  - 2) The slab of size 1000 x 300 x 75mm thick with G40 concrete to be cured outdoor for 28 days for the application of skimcoat.
  - 3) The results of the compressive strength of concrete substrates are given in Table 1.
  - 4) The surface water absorption test was conducted on these concrete substrates in accordance with BS EN 1323:1999. The results of surface water absorption test of the concrete substrates are given in Table 2.

**Results** :

**Table 1: Compressive Strength Test**

Sample Reference	Grade 40 Concrete			
	1	2	3	4
Cube Specimen Reference				
Age at Test (days)	7		28	
Compressive Strength (N/mm <sup>2</sup> )	36.5	38.5	43.5	44.5
Average Compressive Strength (N/mm <sup>2</sup> )	37.5		44.0	

**Table 2: Surface Water Absorption Test on Concrete Substrate**

Sample Reference	Grade 40 Concrete		
	1	2	3
Spot Test Reference			
Surface Water Absorption (cm <sup>3</sup> )	1.2	1.4	1.4
Average Surface Water Absorption (cm <sup>3</sup> )	1.4		




## 2. Preparation of Pull-off Adhesion Strength Test

**Mix Proportion:** As specified by the clients, the mix proportion of the skimcoat by weight is as follows:

Dalmia Skim Coat Premium (Powder)	-	1 part
Water	-	0.32 parts

- Mixing and Application Procedure** :
- 1) The two components were weighed in the above ratio and water was poured into the mixing bowl.
  - 2) The powder was added while mixing within 30 seconds. The mixer was stopped and the side/bottom were scrapped within 30 seconds. It was then remixed simultaneously by Hobart mixer for 3 minutes at low speed.
  - 3) The compound was applied onto the moulded face of the slab in a vertical direction by a trowel, to a maximum thickness of 2mm, and cured under a shaded ambient condition.

## 3. Testing Procedure for Water Retentivity, Setting Time, Compressive Strength and Linear Shrinkage

- Mixing Procedure** :
- 1) The 2 components were weighed in the above ratio and the water was placed in the mixing bowl of a Hobart mixer.
  - 2) The compound was mixed under the same procedure as above.
  - 3) The water retentivity test and setting time test were done in accordance with BS 4551: 2005+A2:2013 and BS EN 196: Part 3:1995 +A1: 2008 respectively.
  - 4) The setting time was determined under room temperature of  $23 \pm 3^{\circ}\text{C}$  and  $65 \pm 15\%$  relative humidity.
  - 5) 3 nos of  $40 \times 40 \times 160$  prisms were cast for the compressive strength test in accordance with BS EN 1015-11:1999 and 4 nos of  $25 \times 25 \times 285$ mm prisms were cast from separate mixes for determination of linear shrinkage in accordance with ASTM C531:2000 (Reapproved 2012)

## 4. Curing of Test Specimens

- Curing Procedure** :
- 1) The applied test-slab was cured under shaded ambient condition until the age for 14 days.
  - 2) The applied test-slab was tested for pull-off adhesion strength at 14 days.
  - 3) The prism specimens were cured in air at  $23 \pm 3^{\circ}\text{C}$  until 28 days of age for compressive strength and shrinkage test respectively.

- Test Results** :
- 1) The summary of the test results and requirements are given in Table 3.
  - 2) The results for water retentivity, setting time, density of prism, compressive strength and shrinkage are given in Table 4 to 8 respectively.
  - 3) The tensile adhesion strength for 14 days is given in Table 9.
  - 4) The compressive strength and tensile adhesion meets the BS EN 998-1:2003 specification.





Results :

**Table 3: Summary of Test Results**

Physical Characteristics	BS EN 998-1:2003 Requirements				Dalmia Skim Coat Premium
Water / Powder Ratio	-				0.32
Water Retentivity (%)	-				99.9
Setting Time (mins)	Initial	-			245
	Final	-			315
Average Compressive Strength (N/mm <sup>2</sup> )	CS I	CS II	CS III	CS IV	8.4
	0.4 to 2.5	1.5 to 5.0	3.5 to 7.5	≥ 6	
Average Shrinkage (%)	-				0.07
Tensile Adhesion Strength at 14days (N/mm <sup>2</sup> )	Declare Value 0.8 by client				0.9

**Table 4: Water Retentivity**

Sample Reference	Dalmia Skim Coat Premium	
Specimen Reference	1	2
Date of Test	23/06/2016	
Water Retentivity (%)	99.9	99.9
Average Water Retentivity (%)	99.9	

**Table 5: Setting Time**

Sample Reference	Dalmia Skim Coat Premium	
Date of Test	24/06/2016	
Setting time (min)	Initial	245
	Final	315

**Table 6: Density of Hardened Prism**

Sample Reference	Dalmia Skim Coat Premium		
Specimen Reference	1	2	3
Size of Prism (mm)	40x40x160		
Weight of Prism (g)	284.3	280.4	285.0
Density (kg/m <sup>3</sup> )	1110	1100	1110
Average Density (kg/m <sup>3</sup> )	1110		




**Table 7: Compressive Strength**

Sample Reference	Dalmia Skim Coat Premium					
Specimen Reference	1	2	3	4	5	6
Date of Cast	23/06/2016					
Date of Test	21/07/2016					
Age at Test (days)	28					
Size of Cubes (mm)	160 x 40 x 40					
Compressive Strength (N/mm <sup>2</sup> )	9.1	8.6	8.2	7.8	8.3	8.2
Average Compressive Strength (N/mm <sup>2</sup> )	8.4					

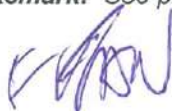
**Table 8: Shrinkage**

Sample Reference	Dalmia Skim Coat Premium			
Specimen Reference	1	2	3	4
Date of Cast	27/06/2016			
Date of Test	25/07/2016			
Age at Test (days)	28			
Size of Prism (mm)	25 x 25 x 285			
Shrinkage at 28 Days (%)	0.08	0.05	0.09	0.07
Average Shrinkage at 28 Days (%)	0.07			

**Table 9: Tensile Adhesion Strength**

Sample Reference	Dalmia Skim Coat Premium									
Specimen Reference	1	2	3	4	5	6	7	8	9	10
Flow (mm)	146									
Bond Area (mm <sup>2</sup> )	1963									
Date of Application	23/06/2016									
Date of Test	07/07/2016									
Age at Test (days)	14									
Tensile Adhesion Strength (N/mm <sup>2</sup> )	0.9	0.7	0.9	0.7	0.9	0.9	0.7	0.8	1.0	1.0
Average Tensile Adhesion Strength(N/mm <sup>2</sup> )	0.9									
Mode of Failure	Cohesion Fracture (Fracture in the mortar itself)									

**Remark:** See photograph 1 for reference



Suresh Mehnar  
Testing Officer



Jasbeer Singh  
Engineer (CMTD)  
Construction Technology Division



*Photograph 1: shows tensile adhesion strength test at age of 14 days.*

