



# केन्द्रीय विद्युत अनुसंधान संस्थान

(भारत सरकार की सोसाइटी, विद्युत मंत्रालय)

प्रो सर सी. वी. रामन रोड, सदाशिवनगर डाक घर, पो. बा. सं. 8066, बेंगलूर - 560 080

## CENTRAL POWER RESEARCH INSTITUTE

(A Govt of India Society under Min. of Power)

Prof. Sir C.V. Raman Road, Sadashivanagar P.O., P.B. No. 8066, Bangalore - 560 080, India

वेबसाइट/website : <http://www.cpri.in>

### Diagnostic, Cables & Capacitors Division

Fax : 080-23601213 / 23604435

Ph : 23602919 ext.2321, 23604435(dir)

E-Mail : [mallik@cpri.in](mailto:mallik@cpri.in)

By Hand

2/1/DCCD(FRLS)/14-15

Dt.18/03/2015

M/s. NCL Industries Limited,  
Raghava Ratna Towers,  
7<sup>th</sup> Floor, Chirag Ali Lane,  
Hyderabad – 500 001.

Sub : Heat Release Test on Bison Panel samples  
Ref No : Letter No. NCL/MKTG/2014-15 dt.23.02.2015

Dear sir

This has reference to your letter no. NCL/MKTG/2014-15 dated 23.02.2015 regarding heat release test on Bison Panel Sample as ISO 5660-1..

As requested the tests have been completed and the test report No. DCCD – 14467 dated. 18.03.2015 is enclosed.

Any discrepancy in the test report may please be informed within forty five days from the date of receipt of the test report.

In order to prevent tampering of test report, CPRI has introduced hologram on the first page of the test report with effect from 01.10.2007

The receipt of the test report may please be acknowledged.

Thanking you and assuring you our services at all times,

Yours faithfully,

(K.Mallikarjunappa)  
Joint Director

CPRI

## TEST REPORT



**Central Power Research Institute**

(A Govt. of India Society,)  
P.B. No.8066, Sadashivanagar Post Office  
Prof. Sir.C.V. Raman Road,  
Bangalore - 560 080(INDIA)

## TEST REPORT



CPRI

Test Report Number : DCCD-14467 Dated: 18.03.2015

Name & Address of the Customer : M/s. NCL Industries Limited,  
Raghava Ratna Towers,  
7<sup>th</sup> Floor, Chirag Ali Lane,  
Hyderabad – 500 001.

Name & Address of the Manufacturer : M/s. NCL Industries Limited,  
Raghava Ratna Towers,  
7<sup>th</sup> Floor, Chirag Ali Lane,  
Hyderabad – 500 001.

Particulars of sample tested : Bison Panels Samples

Condition of the Sample on Receipt : New  
Type : Nil  
Designation : Bison Panels Samples  
Serial Number : Nil  
Number of samples tested : One  
Date(s) of Test(s) : 17.03.2015  
CPRI sample code no : DCCDFRLS15S0026

Particulars of tests conducted : Heat Release Measurement Test at 50 kW/m<sup>2</sup>

Test in accordance with standard/specification : ISO 5660-1 / 2002  
Sampling plan : Not applicable  
Customer's requirement : Nil  
Deviations if any : Nil

Name of the witnessing persons :  
Customer's representatives : None  
Other than Customer's representatives : None  
Test subcontracted with address of the laboratory : None

Documents constituting this report (in words) :  
Number of Sheets : Five  
Number of oscillograms : Nil  
Number of graphs : Nil  
Number of photos : Nil  
Number of Test Circuit Diagrams : Nil  
Number of Drawings : Nil

*R. Arunjothi*  
(R. Arunjothi)  
Test Engineer



*K. Mallikarjunappa*  
(K. Mallikarjunappa)  
Joint Director

# CENTRAL POWER RESEARCH INSTITUTE

## TEST REPORT

Test Report No.: DCCD-14467

Date: 18.03.2015



## TEST RESULTS


**CPRI**

### HEAT RELEASE MEASUREMENT TEST

- 1) Sample description : Bison Panels Sample – Sample 1
- Thickness : 8 mm
- Test Procedure : ISO 5660-1 / 2002

Specimen information		Test times	
E	13.1 MJ/kg	Time to ignition	439 sec
Sample Size	100 mm X 100 mm	Time to flameout	716 secs
Thickness	8 mm	End of test time	1800 sec
Initial Mass	113.6 g	<b>Heat Release Results</b>	
Surface Area	88.4 cm <sup>2</sup>		
Heat flux	50 kW/m <sup>2</sup>		
Separation	25 mm		
Orientation	Horizontal		
Grid Used	No	THR (0-300)	1.36 MJ/m <sup>2</sup>
Sampling time	2 secs	THR (0-600)	9.58 MJ/m <sup>2</sup>
		THR (0-1200)	22.82 MJ/m <sup>2</sup>

Test Results between 439 and 1800 s			Mean
Total heat release	25.1 MJ/m <sup>2</sup>	Heat release rate (kW/m <sup>2</sup> )	18.44
Total oxygen consumed	17.2 g	Effective heat of comb. (MJ/kg)	26.56
Total smoke release	12192.0 m <sup>3</sup> /m <sup>2</sup>	Mass loss rate (g/s)	0.7
Total smoke production	107.8 m <sup>3</sup>	Carbon monoxide yield (kg/kg)	0.1404
MARHE	20.8 kW/m <sup>2</sup>	Carbon dioxide yield (kg/kg)	2.21

  
 (R. Arunjothi)  
 Test Engineer



# CENTRAL POWER RESEARCH INSTITUTE

5

## TEST REPORT

Test Report No.: DCCD-14467

Date: 18.03.2015



## TEST RESULTS

**CPRI**

- 2) Sample description : Bison Panels Sample – Sample 2
- Thickness : 12 mm
- Test Procedure : ISO 5660-1 / 2002

Specimen information		Test times	
E	13.1 MJ/kg	Time to ignition	620 sec
Sample Size	100 mm X 100 mm	Time to flameout	1323 secs
Thickness	12 mm	End of test time	1800 sec
Initial Mass	150 g	<b>Heat Release Results</b>	
Surface Area	88.4 cm <sup>2</sup>		
Heat flux	50 kW/m <sup>2</sup>		
Separation	25 mm		
Orientation	Horizontal		
Grid Used	No	THR (0-300)	1.70 MJ/m <sup>2</sup>
Sampling time	2 secs	THR (0-600)	5.97 MJ/m <sup>2</sup>
		THR (0-1200)	26.04 MJ/m <sup>2</sup>

Test Results between 620 and 1800 s			Mean
Total heat release	27.2 MJ/m <sup>2</sup>	Heat release rate (kW/m <sup>2</sup> )	22.98
Total oxygen consumed	18.2 g	Effective heat of comb. (MJ/kg)	15.48
Total smoke release	12982.7 m <sup>2</sup> /m <sup>2</sup>	Mass loss rate (g/s)	1.48
Total smoke production	114.8 m <sup>2</sup>	Carbon monoxide yield (kg/kg)	0.0415
MARHE	21.8 kW/m <sup>2</sup>	Carbon dioxide yield (kg/kg)	1.21

*R. Arunjothi*  
(R.Arunjothi)  
Test Engineer

# CENTRAL POWER RESEARCH INSTITUTE



## TEST REPORT

Test Report No.: DCCD-14467

Date: 18.03.2015

## TEST RESULTS

- 3) Sample description : Bison Panels Sample – Sample 3
- Thickness : 16 mm
- Test Procedure : ISO 5660-1 / 2002

Specimen information		Test times	
E	13.1 MJ/kg	Time to ignition	760 sec
Sample Size	100 mm X 100 mm	Time to flameout	1644 secs
Thickness	16 mm	End of test time	1800 sec
Initial Mass	203.5 g	<b>Heat Release Results</b>	
Surface Area	88.4 cm <sup>2</sup>		
Heat flux	50 kW/m <sup>2</sup>		
Separation	25 mm		
Orientation	Horizontal		
Grid Used	No	THR (0-300)	1.70 MJ/m <sup>2</sup>
Sampling time	2 secs	THR (0-600)	6.34 MJ/m <sup>2</sup>
		THR (0-1200)	27.58 MJ/m <sup>2</sup>

Test Results between 760 and 1800 s			Mean
Total heat release	31.4 MJ/m <sup>2</sup>	Heat release rate (kW/m <sup>2</sup> )	30.06
Total oxygen consumed	21 g	Effective heat of comb. (MJ/kg)	13.95
Total smoke release	4048.8.0 m <sup>2</sup> /m <sup>2</sup>	Mass loss rate (g/s)	2.15
Total smoke production	35.8 m <sup>2</sup>	Carbon monoxide yield (kg/kg)	0.0314
MARHE	24.1 kW/m <sup>2</sup>	Carbon dioxide yield (kg/kg)	1.11

  
 (R.Arunjothi)  
**Test Engineer**

# CENTRAL POWER RESEARCH INSTITUTE




## TEST REPORT

Test Report No.: DCCD-14467

Date: 18.03.2015

### NOTE

- The test results relate only to the item(s) tested.
- Publication or reproduction of this test report in any form other than by complete set of the whole report and in the language written is not permitted without the written consent of CPRI.
- Any Correction/erasure invalidates the test report.
- Any anomaly/discrepancy in this test report should be brought to the notice of CPRI within 45 days from the date of issue.

  
(R.Arunjothi)  
Test Engineer