



Intertek Testing Services ETL SEMKO

Attn: Mr. Walter Constantine
Draka USA
22 Joseph E. Warner Blvd.
North Dighton, MA 02764

April 16, 2003

For:
Draka Nederland B. V
P.O. Box 1117
1000 BC Amsterdam
The Netherlands

Dear Mr. Constantine:

This letter report certifies that your HXXMB-FR, Marine Shipboard Cables, comply with the requirements for IEC 60331-21 1999 – Fire Resistance Characteristics of Electric Cables – Circuit Integrity & IEC 60092-3 Voltage Withstand Test for .6/1kV rated cables. A representative sample identified as “Draka Kabel 12 Conductor (6X2X1.5mm²) HXXMB-FR EEP” was evaluated to these requirements on April 11, 2003.

TEST No. 1: Circuit Integrity

Test Description:	Circuit Integrity	Specification	IEC 60331-21
Start Date:	April 11, 2003	Completion Date	April 11, 2003
Testing Location:	Intertek Testing Services Cortland, New York, USA	Tested by:	T. Pidtychak
		Reviewed by:	C. Barlow
Cable Description:	Draka Kabel 12 Conductor (6X2X1.5mm ²) HXXMB-FR EEP		
Test Requirements:	No fuses shall fail during the 90 minutes of the flame test. Cable shall withstand the applied voltage of .6/1kV for an additional 15 minutes after the flame test.		
Description of Test Sample:	1.2 meter length		
Test Procedure:	In accordance with IEC 60331-21		
Results:	No fuses failed during the 90 minute flame test and cable witheld the applied voltage for the 15 minutes after the flame test.		
Conclusion:	The cable complies with the requirements.		
Test Equipment:			
	Equipment used:	Control Number:	Calibration Date:
	Stop Watch	PUL	Due 7/00/04
	Tape Measure	N751	Due 8/19/03
	Thermocouple	T985	Due 4/02/04



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TEST No. 2: Voltage Withstand

Test Description:	Voltage Withstand	Specification	IEC 60092-3
Start Date:	April 11, 2003	Completion Date	April 11, 2003
Testing Location:	Intertek Testing Services Cortland, New York, USA	Tested by:	Walter Schilloff
		Reviewed by:	C. Barlow
Cable Description:	Draka Kabel 12 Conductor (6X2X1.5mm ²) HXXMB-FR EEP		
Test Requirements:	Sample shall not show evidence of dielectric breakdown.		
Description of Test Sample:	1.2 meter length		
Test Procedure:	In accordance with IEC 60092-3		
Results:	Sample did not show evidence of dielectric breakdown during the application of 3.5 kV.		
Conclusion:	The cable complies with the requirements.		
Test Equipment:			
	Equipment used:	Control Number:	Calibration Date:
	Stop Watch	PUL	Due 7/00/04
	Tape Measure	N751	Due 8/19/03
	HiPot	960396	Due 10/03/03

This previously qualified Instrumentation Cable voltage rating has been upgraded to .6/1kV from 250 volts.

Sincerely,

Chuck Barlow
Associate Engineer – Cabling Products
Intertek Testing Services - Cortland Office

cc: Mr. Walter Constantine – Draka USA
Mr. Jeff Eby – Eby Energy Products

Peter

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Attn: Mr. Walter Constantine
Draka USA
22 Joseph E. Warner Blvd.
North Dighton, MA 02764

May 2, 2003

For:
Draka Nederland B. V
P.O. Box 1117
1000 BC Amsterdam
The Netherlands

Dear Mr. Constantine:

This letter report certifies that your HXXM EEP, HXXM-FR EEP, HXXMB EEP, & HXXMB-FR EEP, Marine Shipboard Cables, complies with the requirements for Crush Resistance and Impact Resistance in accordance with UL 1277, UL 2225, & UL 1569. Testing to these requirements began on April 11, 2003 and concluded on April 21, 2003. Testing was performed at Draka USA Test Laboratory in North Dighton, MA under the Supervised Applicant Testing (SAT) Program. Test results were then submitted to Intertek Testing Services in Cortland, NY for review and approval.

TEST No. 1: Crush Resistance

Test Description:	Crush Resistance	Specification	UL 1277, UL 2225, UL 1569
Start Date:	April 11, 2003	Completion Date	April 21, 2003
Testing Location:	Draka USA Test Laboratory, North Dighton, MA	Tested by:	John Costa - Draka USA
		Reviewed by:	George Ferreira - Draka USA
		Approved by:	Kendall Waterman - Draka USA
		Reviewed by:	Tim Pidlypchak - Intertek Testing Services
		Approved by:	Chuck Barlow - Intertek Testing Services
Cable Description:	Draka Kabel 12 Conductor (6X2X1.5mm ²) HXXMB-FR EEP Samples were 4 x 2.5 mm ² , 4 x 1.5 mm ² , and 4 x 25 mm ² (metric equivalent of 14//4 and 4/2)		
Test Requirements:	Cable components shall not short to one another when crushed with a force of 1500 lbs for 14AWG, and 2000 lbs for 2 AWG.		
Sample Description:	10 foot pieces of completed cable		
Test Procedure:	In accordance with UL 1277, UL 2225, and UL 1569 Crush Speed: 0.5 inches per minute, Steel Rod O.D.: 0.75 inches, Steel Plate Width: 2 inches		
Results:	4 x 2.5 mm ²	4 x 1.5 mm ²	4 x 25 mm ²
Crush 1:	4122 lbf	3230 lbf	10000 lbf
Crush 2:	3958 lbf	3180 lbf	4000 lbf
Crush 3:	4188 lbf	3803 lbf	10000 lbf
Crush 4:	4209 lbf	3522 lbf	10000 lbf
Crush 5:	2240 lbf	3572 lbf	2596 lbf
Crush 6:	4224 lbf	3810 lbf	10000 lbf
Crush 7:	4616 lbf	3263 lbf	10000 lbf
Crush 8:	4850 lbf	3090 lbf	10000 lbf
Crush 9:	4459 lbf	3670 lbf	3635 lbf
Crush 10:	4091 lbf	3694 lbf	10000 lbf
Average:	4096 lbf	3460 lbf	7803 lbf
Conclusion:	The cable complies with the requirements.		
Test Equipment:	Equipment used:	Control Number:	Calibration Date:
	Instron	L367	N/A
	Instron	L368	Due 9/25/03
	Fluke	L242	Due 1/03/04



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TEST No. 2: Impact Test

Test Description:	Impact Test	Specification	UL 1277, UL 2225, UL 1569
Start Date:	April 11, 2003	Completion Date	April 21, 2003
Testing Location:	Draka USA Test Laboratory, North Dighton, MA	Tested by:	John Costa - Draka USA
		Reviewed by:	George Ferriera - Draka USA
		Approved by:	Kendall Waterman - Draka USA
		Reviewed by:	Tim Pidlypchak - Intertek Testing Services
		Approved by:	Chuck Barlow - Intertek Testing Services
Cable Description:	Draka Kabel 12 Conductor (6X2X1.5mm ²) HXXMB-FR EEP Samples were 4 x 2.5 mm ² , 4 x 1.5 mm ² , and 4 x 25 mm ² (metric equivalent of 14/4 and 4/2)		
Test Requirements:	Cable conductors shall not short to one another more than 2 out of 10 times when the specimen is impacted.		
Sample Description:	12 foot pieces of completed cable		
Test Procedure:	In accordance with UL 1277, UL 2225, and UL 1569		
Test Set-up:	14 AWG UL 1277 & UL 1569	2 AWG UL 1277, UL 1569 & UL 2225	14 AWG UL 2225
Impact Weight:	10 lbs	50 lbs	25 lbs
Impact Surface O.D.:	0.75 inches	0.75 inches	0.75 inches
Drop Distance:	18 inches	12 inches	12 inches
Impact Force:	15 foot-lbs	50 foot-lbs	25 foot-lbs
Results:	4 x 2.5 mm ²	4 x 1.5 mm ²	4 x 25 mm ²
Impact 1:	No Short	No Short	No Short
Impact 2:	No Short	No Short	No Short
Impact 3:	No Short	No Short	No Short
Impact 4:	No Short	No Short	No Short
Impact 5:	No Short	No Short	No Short
Impact 6:	No Short	No Short	No Short
Impact 7:	No Short	No Short	No Short
Impact 8:	No Short	No Short	No Short
Impact 9:	No Short	No Short	No Short
Impact 10:	No Short	No Short	No Short
Number of shorts:	None	None	None
Conclusion:	The cable complies with the requirements.		
Test Equipment:			
	Equipment used:	Control Number:	Calibration Date:
	3 Phase Load Cycle Test Set	L213A	Due 7/9/2003
	Impact Tester	L182	N/A

This previously qualified Instrumentation Cable voltage rating has been upgraded to .6/1kV from 250 volts.

Sincerely,

Chuck Barlow
Associate Engineer - Cabling Products
Intertek Testing Services - Cortland Office

cc: Mr. Walter Constantine - Draka USA
Mr. Jeff Eby - Eby Energy Products