

Standard Laminate Testing According to NEMA LD3 (2005)

NCSU has been working with the laminates industry since 1980 providing product testing and developing and evaluating test methods and standards. We can run the full series of NEMA LD3 laminate tests or selected tests. The NEMA LD3 tests are designed for high pressure paper laminates (HPDL). These tests are also used for evaluating a wide range of laminates and laminated panels, however the interpretation of results can be less straight forward. Specimen preparation is normally done in our lab, however non-HPDL laminates (films, impregnated papers and foils) may need to be provided laminated to substrate (please inquire for particulars)

SPONSOR will be billed for materials and actual hours worked, (not to exceed the estimated cost without written authorization – standard lab rate is \$75/hr), invoiced at time of delivery of final report, payable in full net 30 days (in US funds drawn on a US bank).

IMPORTANT: A FULLY EXECUTED ANALYSIS AND TESTING AGREEMENT MUST BE COMPLETED FOR ANY TESTING WORK ESTIMATED OVER \$1000.

IMPORTANT

- These tests are conducted according to the procedures described in NEMA standards LD3-2005 except where noted.
- The NEMA LD3-2005 test procedures and standards are designed for high pressure decorative laminates, and their use with other products may produce misleading or irrelevant results.
- We do not certify a manufacturer's laminate. We report only on the results of a given sample of laminate which has been submitted to our laboratory.
- The name of the University is not to be used in any type of advertising or promotional efforts.
- We have undertaken high pressure decorative laminate testing as an independent testing laboratory largely as a service to the laminate manufacturers and the furniture industry. However, our main purpose is that of education and research, which means that we cannot always respond quickly to requests for testing.

Initiation of a testing project requires written authorization to do the work, including description of the tests required, list of materials submitted, and full contact information for report submission and billing (name, address, phone, FAX, email if available). A fully executed University Analysis and Testing Agreement (ATA) must be completed for projects estimated at over \$1000 US. (When I have a written description of the project [tests and materials] and the proper contact information, I can submit the project to the Associate Dean of Research for processing of the ATA.)

The following is a general cost estimate covering typical general purpose and postforming grades of HPDL. Actual time required to test a specific material (depending on the test) is dependent on the properties of the material, and may vary greatly from this estimate. Please note that some tests list a cost for setup/run which covers time for equipment setup and calibration for a run of between 1 and 10 materials (ex. Light resistance: 1 material = 300 + 25 = 325, 10 materials = 300 + 10(25) = 550). Cost for correspondence, clerical, report generation, etc. is covered under 'report' and must be included in each project. (more info on testing at <http://www4.ncsu.edu/~calfor/wp/LamLab.html>)

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NEMA LD3 Testing approximate cost estimate

		<i>setup/run</i>	<i>per-samp</i>	# products	Cost
LD3.1	Appearance	\$50	\$50		
LD3.2	Surface Finish (gloss)		\$50		
LD3.3	Light Resistance	\$300	\$25		
LD3.4	Cleanability/Stain	\$50	\$50		
LD3.5	Boiling Water		\$100		
LD3.6	High Temp		\$100		
LD3.7.2	Linear Glass Scratch	\$25	\$50		
LD3.7.3	Diamond Scratch	\$25	\$50		
LD3.8	Ball Impact		\$75		
LD3.9	Dart Impact		\$75		
LD3.10.2	Radiant Heat (coil)	\$50	\$100		
LD3.10.3	Radiant Heat (strip)	\$50	\$100		
LD3.11	Dimensional Change	\$50	\$50		
LD3.12	Dimensional Stability	\$50	\$50		
LD3.13	Wear	\$50	\$125		
LD3.14	Formability	\$50	\$100		
LD3.15	Blister	\$50	\$50		
ASTM D790	Flexural strength, MOE (compact only)	\$50	\$150		
ASTM D638	Tensile strength (compact only)	\$50	\$200		
	<i>report</i>	\$100	\$25		

Sponsor contact info:

Name:.....
 Company:.....
 Address:.....

 City, St, zip.....
 Phone.....
 FAX.....
 Email.....

Billing info:

Name:.....
 Company:.....
 Address:.....

 City, St, zip.....
 Phone.....
 FAX.....
 Email.....

Samples should be sent to:

Dr. C. A. LaPasha
 rm 110 Hodges Wood Products Lab
 Department of Wood & Paper Science
 North Carolina State University
 Raleigh, NC 27695-8005 USA

Correspondence should be sent to:

Dr. C. A. LaPasha
 campus box 8005
 Department of Wood & Paper Science
 North Carolina State University
 Raleigh, NC 27695-8005 USA
 FAX: 919-513-3496 or 919-515-6302
 Tel: 919-515-2850 email: calfor@unity.ncsu.edu
<http://www4.ncsu.edu/~calfor/wp/LamLab.html>

NEMA LD 3-2005

The standard and/or any of its annexes can be downloaded free of charge from NEMA's website at

<http://www.nema.org/stds/ld3.cfm>

Hardcopies can be purchased by contacting
Global Engineering Documents
(800) 854-7179 (within the U.S.),
(303) 397-7956 (international),
(303) 397-2740 (fax).