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Underwriters' Laboratories, Inc.

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National Board of Fire Underwriters
207 E. OHIO ST., CHICAGO 11, ILLINOIS

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Revised

This is the

FACTORY INSPECTION AND LABEL SERVICE PROCEDURE

PLASTIC

~~RESISTANCE~~

Manufacturer: Westinghouse Electric Corp., Micarta Div.
Hampton, South Carolina

Applicant: Same as Manufacturer

Listee: Same as Manufacturer

and authorizes the use of labels on this product when made by the above manufacturer in accordance with the accompanying description, and inspection at the factory located at the above address, under the conditions set forth herein.

It contains information for the guidance of the above named manufacturer and of Underwriters' Laboratories, Inc.'s representatives and inspectors and is not to be used for any other purpose. It is loaned to the above manufacturer with the understanding that it is not to be copied, either wholly or in part, and that it will be returned to Underwriters' Laboratories, Inc. upon request.

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UNDERWRITERS' LABORATORIES, INC.

Reviewed by

A. A. Binder
Engineer.

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Superintendent, Label Service.

AAB:VAM

D E S C R I P T I O N

PRODUCT COVERED:

Plastic material made by laminating various types of impregnated paper sheets together under heat and pressure. The material shall be identified as Fire-Resistant Decorative Micarta. The finished sheets may have either a solid color or patterned surface.

MANUFACTURING PROCESS:

SURFACE

The surface of the laminate shall consist of a saturating grade of alpha cellulose paper which has been pigmented to give desired color and opacity. This sheet may be either solid color or it may be printed to show a pattern.

Solid Color (Decorative)

The solid color sheet is treated with melamine varnish (manufactured according to Westinghouse varnish Specification No. 7H37 or equivalent) to a resin pick-up ratio of 2.00 to 2.45 per cent, and to a volatile content of 3.5 to 6.0 per cent, and greenness of 0.7 to 2.0 per cent. (Inspector see explanation of these tests under "Test Method and Apparatus.")

Print (Patterned)

An overlay sheet treated with a melamine formaldehyde varnish (Westinghouse varnish Specification No. 7H38 or equivalent) according to treating Specification No. 5H211 is placed on the top of the print or patterned sheet, to increase the abrasion resistance. This overlay sheet has a resin ratio of 2.40 to 3.30 per cent, a volatile of 4.0 to 6.0 per cent, and a greenness of 2 to 10.0 per cent.

Because of the addition of the overlay sheet, the print or patterned sheet is reduced to a resin ratio of 1.60 to 1.86 per cent, the volatile is 3.5 to 6.0 per cent, and the greenness is reduced to 0.4 to 2.0 per cent.

CORE STOCK

The core stock of the laminate consists of an asbestos paper treated with a modified phenol formaldehyde varnish (Westinghouse varnish Specification No. 7H90) according to the treating Specification No. 5H68. Greenness shall be between 0.15 and 0.3 per cent. Resin pick-up ratio 1.53 to 1.58 per cent, volatile 3.5 to 4.0 per cent.

MOLDING (PANEL DRY-UP)

Solid Color (Decorative) Laminate

The solid color laminate is molded with the following construction:

- 1 surface sheets
- 8 Specification No. 5H68 (see core stock section above)

Print (Patterned)

The print or patterned laminate is molded with the following construction:

- 1 Specification No. 5H211 overlay (see section on print sheet)
- 1 print sheet
- 8 Specification No. 5H68 (see section on core stock)

MOLDING PROCESS

The laminates are laid up eight boards per pack with each surface against a No. 7 or No. 8 finish chrome-plated stainless-steel plate or chrome-plated hardened brass plate. The pack, containing eight boards, is inserted into the openings between platens of a hydraulic press. A pressure of 1000-1500 psi is applied. The platens are heated to 285-305 F. The load is held on heat until a thermocouple, placed between the backs of No. 4 and 5 boards, records 13-15 min above 270 F and then the load is placed on cooling. The cooling cycle is continued until the thermocouple within the pack records 130 F or less.

The sheets are then trimmed to size, sanded to 0.050 ± 0.004 in., and satinized, if specified.

COMPONENT PARTS:

Surface Sheet - A pigmented alpha cellulose paper manufactured by Wrenn Paper Company, of Middletown, Ohio; Hurlbut Paper Company, North Lee, Mass.; Fitchburgh Paper Company, Fitchburgh, Mass. The basis weight determined by weighing 500 sheets of the paper 24 by 36 in. shall be between 90 and 105 lb.

Asbestos Paper (Core Stock) -

Manufacturer - Keesbey & Mattison, or equivalent
Marking on roll - PDS 2118
Properties of paper - Ash Content - 70-80 per cent

FINISHED PRODUCT:

SOLID COLOR OR PRINT LAMINATES

Ash Content - Minimum - 36 per cent.

Thickness - 0.050 ± 0.004 in.

Qualitative Chemical Identification - Shall indicate presence of cyanide and phenol.

Small-Scale Fire Test - The small-scale fire test shall be conducted in accordance with the method hereafter described on samples of the finished product taken from production line or from stock.

Samples tested shall comply with the following specifications. (See ILL. 1, sample No. 3)

STANDARD ASBESTOS, SOLID COLOR AND PATTERNED

Time of ignition (yellow flame) 2-8 sec
Maximum burning time 30 sec

Resistance of Surface to Cigarette Burns - Failure shall consist of the occurrence of blistering, charring, permanent discoloration, or cracking of the surface. The standard asbestos laminates shall not fail in less than 80 sec, when tested in accordance with the method described under "Test Apparatus and Methods".

MARKING:

Each sheet or pallet load of plastic complying with all the details of this description shall be eligible to bear the combination label containing the following information:

1. Manufacturer's name.
2. Label Service Symbol reading:
UNDERWRIGHTERS' LABORATORIES, INC.

INSPECTED
LAMINATED PLASTIC
NOT OVER + SQ FT ISSUE NO.

The number of square feet shall not exceed the label denomination.

KR:s1

3. Statement pertaining to classification:

Fire Hazard Classification
(Based on 100 for untreated red oak)

Flame Spread
Fuel Contributed
Smoke Developed

4. The following factors identification.
None

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IN MISSISSIPPI CASES 3/18/92

I N S T R U C T I O N S F O R E X A M I N A T I O N
A N D T E S T S

BY INSPECTOR:

At each inspection the inspector shall witness one phase of the manufacturing process that is in operation at the time of his visit. This inspection may be one of the following:

1. Resin Make Up - Inspector should check to see that resin specification number has not changed.
2. Core Paper or Decorative Paper Impregnation - Inspector shall witness plant chemist conduct per cent volatile, greenness, and resin pick-up on paper being treated and determine that it meets specifications.
3. Panel Lay-Up - Inspector shall witness the actual lay-up of the panels to determine that the lay-up specifications are met. (See Page 2, this Procedure.)
4. Molding Process - Inspector shall witness the molding process to see that it is in accord with this Procedure.

At each inspection the inspector shall check the manufacturer's records of the material produced since the last inspection to see that (1) the specifications have not changed, (2) the material produced has met the specifications.

The inspector shall check either the purchase specifications of the core stock or he shall check an actual roll of the core stock to see that proper marking is used and that the weight and ash content are as specified.

He shall either witness nine tests run (three of each of three different samples) to determine the resistance of the surface to cigarette burns, or he shall review the test records of previous runs to see that there is not more than three failures in each eighteen successive tests.

He shall conduct six small-scale fire tests on the samples of the same material used for the cigarette test.

He shall determine the thickness of the finished product on each of the six samples.

At periodic intervals at the direction of the Superintendent of Label Service or the Supervising Inspector of the Chicago Office, the inspector shall select and identify four sheets of the finished product making sure that two sheets are solid color and two sheets are patterned. Each sheet to be approx 2 ft sq, and forward to the Chemical Department, Chicago Office. He shall also check the calibration of the standard flame described under the ease of ignition and burning test.

AT CHICAGO:

The Chicago Office shall conduct tests for per cent ash and qualitative tests as indicated on the finished product.

SAMPLING:

Six sheets, 2 of solid color and three pattern panels shall be selected as the sample lot for examination and test. If any one specimen from this sample lot shall fail the specification, a second sample lot of an additional six panels can be selected (except as noted under "rejection" for cigarette burn test) and specimens from it selected for additional tests of the failing characteristics in the same manner as the original specimens. If not more than one specimen from the entire sample (both sample lots) fails the specification, the lot shall be considered passing.

If more than one specimen of the first lot or one specimen from the second lot fails, the lot shall be considered failing and labels shall be removed.

REJECTION:

If a lot is rejected, the manufacturer may hold the entire lot with labels attached pending appeal to the Superintendent of Label Service, should it be the manufacturer's opinion the lot is acceptable. Otherwise, the manufacturer may make a thorough review of the lot and resubmit any portion for retest and relabeling.

TEST APPARATUS AND METHODS

GENERAL:

The apparatus and test methods shall be as described in this Procedure. The manufacturer shall provide all the necessary equipment and facilities required to conduct the tests which are to be made at the factory.

THICKNESS:

SAMPLES

Six sheets of the sample lot shall be tested. If the average value from any sheet fails the specification, six additional sheets shall also be tested.

APPARATUS

A micrometer capable of measuring to the nearest 0.001 in.

METHOD

Readings shall be taken at five points distributed throughout each sheet at a minimum of 1 in. from any edge. The average of the five readings shall be considered the value for that sheet.

RESIN PICK-UP RATIO:

The resin pick-up ratio shall be calculated as follows:

$$RPR = \frac{A}{B} \text{ where}$$

RPR = resin pick-up ratio

B = weight of sample sheet of paper before treating with resin

A = weight of same sample sheet of paper (used in B) after treating with resin

GREENNESS:

SAMPLES

Approximately ten by 3-in. samples of treated paper stacked.

APPARATUS

Hydraulic press.

METHOD

The stack of treated paper weighing approx 15 g weighed to the nearest 0.1 g is placed between chrome-plated stainless-steel plates; the plates are then inserted into the heated platens of a hydraulic press and 1000 psi applied. The platens are heated to 164-170 C. The sample is molded for 5 min. It is then removed and the extruded resin removed. The sample is then weighed to the nearest 0.1 g.

The final weight is subtracted from the initial weight this figure is divided by the original weight to give the per cent greenness.

PER CENT VOLATILE:

SAMPLE

A 4 by 6-in. (approximate measurement) sheet of treated paper.

APPARATUS

Circulating oven.

METHOD

The sample of treated paper is weighed to the nearest 0.001 g. The sample is inserted into a 150 C convection-type circulating oven for 10 min. The sample is removed and reweighed to the nearest 0.001 g. The final weight is subtracted from the original weight and this figure is divided by the original weight to give the per cent volatile.

SMALL-SCALE FIRE TEST:

SAMPLES

Two 2 by 12-in. specimens (length parallel to axis of corrugation) shall be cut from each panel of each "Finish or Type" selected for examination and test.

APPARATUS

Supporting Frames - For holding 2 by 12-in. samples as described by 116.2.

Burner - Terrill type, 3/8-in. diam ferrule.

Timer - Clock or watch, readable in seconds.

METHOD

All tests are to be conducted in a location free from drafts. Each test specimen shall be clamped vertically in the supporting frame with the bottom edge of the specimen even with the bottom edge of the clamp. The flame shall be 1-1/2 in. high with a distinct inner cone 3/4 in. high (measured from the top of the burner).

The flame shall be applied to the center of the lower edge of the specimen so that approx. 3/4 in. of the flame overlaps the specimen for an exposure of 30 sec, and then removed.

The time of ignition (recognizable by the appearance of a yellow flame), and burning time (time at which flaming stops), shall be recorded.

If the burner flame is extinguished by the escaping gases the sample shall be considered acceptable. If blisters form in the fire area and deflect the flame the test results shall be disregarded and a new sample prepared.

TEST FOR RESISTANCE OF SURFACE TO CIGARETTE BURNS (NEMA STANDARD May 17, 1955, LP2-432)

SAMPLES

The test specimen shall be 3-1/8 by 9 in. of the type to be tested. Three sheets of the sample lot shall be used.

APPARATUS

The test apparatus shall consist of the following:

Several heat insulating sheets of plywood 3-1/4 in. wide by 9 in. long, and having a thickness of 13/16 in. minus the thickness of the type to be tested.

2. A clamping jig to hold the laminate flat against the plywood sheet (see Fig. 2, Page 17).

3. A resistor heating element with silver-soldered copper lead lugs as shown in Fig. 3, Page 18, mounted as shown in Fig. 4, Page 19, and wired in accordance with Fig. 5, Page 20.

4. A draft excluding enclosure having:

A. Approximate inside dimensions as follows:

Width - 13 in.

Length - 16 in.

Height - 10 in.

B. Open bottom, or equally convenient arrangement.

C. Means for visually inspecting the test specimen while it is under test.

5. A stop watch or other suitable timer.

6. A radiation calibration block in accordance with Fig. 6, Page 21.

7. A thermocouple potentiometer for determining the temperature with one iron constantan thermocouple.

8. A suitable spotlight directed on the test area to observe effects.

9. A 1 1/2-in. standard Spermaceti candle (Sargent No. S-1453), Sargent Scientific Company, Chicago, Illinois, or the equivalent), to blacken the metal calibration disc.

METHOD

The apparatus shall be calibrated in accordance with the following method:

Calibration

Place the heating element on the calibration block, making certain that the unit is located against the guides and is flat against the top of the calibration block. This will locate the heating element directly over the metal disc.

Adjust the height of the heating element so that the distance between the disc and the resistance coil is 0.313 in., plus or minus 0.003 in.

Remove the heating element from the calibration block for a preliminary heating period. Adjust the power input to the heating element approx 26 W and allow the heat for 15 min.

Blacken the metal disc with the carbon from the flame of the Spermaceti candle mounted vertically and shielded from all drafts. Hold the calibration block so that the disc is halfway down in the bright yellow portion of the flame. Avoid the lower or darker portion of the flame as it consists of partially unburned wax which produces an undesirable waxy carbon deposit. Allow the carbon to deposit on the disc for 30 sec and then remove the calibration block from the flame. Remove the carbon deposit from the infinite area surrounding the disc.

Replace the heating element over the black disc and cover the assembly to prevent cooling from drafts. Allow 15 min for the calibration disc to heat up with no temperature being determined.

Remove the heating element without interrupting the power input and allow the calibration disc to cool to 40 C. The assembly shall be covered to prevent nonuniform cooling due to drafts. This establishes equilibrium conditions in the insulating block and the heating circuit.

When the calibration block has cooled to 40 C, replace the heating element on the calibration block and cover the assembly within 2 sec. Measure and record the temperature at 1-min intervals, starting at 2 min, for a total of 10 min and plot the curve of temperature versus time. If this calibration curve does not come within the limits of the standard curve (Fig. 7, Page 22), adjust the power input as necessary so that the final observed temperatures are within those indicated on the curve (289-294) for the 10-min reading. If adjustment is necessary, rerun the calibration curve after allowing the calibration block to cool to the prescribed 40 C temperature.

After the necessary adjustments are made, proceed with the test in accordance with the test procedure following.

Test Procedure - Place the test specimen on the surface of the plywood backing and clamp them firmly in the jig. The entire area of the test specimen shall be in contact with the plywood backing.

With the power input to the heater determined in accordance with Par. C, allow the heater to warm for 15 min. Position the heater on the specimen so that the resistance coil is 1-1/2 in. from one edge, start the timer at this instant, and cover the assembly with the enclosure within 2 sec.

Continue the test until the specimen fails or for 10 min. Failure is evidenced by blistering, charring, permanent discoloration, or crazing. If failure occurs before 10 min, note the time of failure. The area of the test specimen under test shall be well lighted with the spotlight.

The test specimen and the plywood block shall be cooled to room temperature and a second test made with the resistance element 1-1/2 in. from the point of the first test. After the test specimen and plywood block have again cooled to room temperature, a third test shall be made with the resistance element 1-1/2 in. from the point of the second test. The heater block shall not rest on an area of the test specimen which has previously been subjected to the test.

The results shall be recorded as the average of the three tests of any one specimen.

Rejection - If more than one failure occurs on the three specimens tested the second three sheets of the sample lot shall be tested. If there are no more than three failures in the six sample sheets (total - eighteen cigarette tests, three on each of the six different samples), the entire lot is acceptable.

AAB

DALLAS COUNTY DOCUMENTS - SCORDING
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#1
STANDARD
DECORATIVE
PATTERN

#2
STANDARD
DECORATIVE
PLAIN

#3
STANDARD
DECORATIVE
PLAIN

#3
STANDARD
ASBESTOS
PATTERN

C60-10228

ILL. 1
R 4301

DALLAS DOCUMENTS
SCOTT HOUSE

SUBJ. 204

ILL. 2
R4301

INSPECTION OF LISTED PRODUCTS

GENERAL

The Laboratories Factory Inspection and Label Service Program provides for the inspection of devices, systems, and material at factories by representatives of Underwriters Laboratories, Inc.

The name "Underwriters Laboratories, Inc." or any abbreviation, symbol, or equivalent thereof shall not be used on or in connection with the product except as such name appears on the label for the product or in connection with the Label Service carton marker as outlined in the following paragraph. However, a listed component of the product may bear a properly authorized label or the Examination Service Marker, whichever is appropriate.

The Laboratories is prepared to recognize the use of a marker of special design on carton or packages containing labeled product to indicate that the contents are labeled. A manufacturer desiring to utilize this carton marker may obtain further information concerning its design and use from the Laboratories' Offices at Chicago, New York, or Santa Clara, California.

LABELS

Labels for PLASTIC
incorporate the Inspection Manifest

UNDERWRITERS' LABORATORIES, INC.,
inspected

together with the classification of the product and a number, by means of which the Laboratories maintains a record of the manufacturer to whom the labels are released, the date of release, and the approximate date of use. It is recommended, that insofar as possible, manufacturers use the labels consecutively with respect to these numbers.

The labels of Underwriters' Laboratories, Inc., attached to a plastic is evidence that such product has been inspected in accordance with the provisions of this Label Service Procedure. THE MANUFACTURER SHALL NOT ATTACH LABELS TO PRODUCT WHICH DOES NOT COMPLY WITH THE REQUIREMENTS OF THIS LABEL SERVICE PROCEDURE, SHALL NOT SHIP LABELS FROM ONE FACTORY TO ANOTHER, AND SHALL NOT FURNISH LABELS TO ANYONE FOR ATTACHMENT TO A PRODUCT OUTSIDE OF THE FACTORY IN WHICH MANUFACTURED AND INSPECTED.

The manufacturer may arrange with the Laboratories for the preparation of so-called combination labels which include, in addition to the above, the manufacturer's own name plate data. Combination labels may be of any design and material which are acceptable to the manufacturer and to Underwriters' Laboratories, Inc.

All labels are to be obtained only from Underwriters' Laboratories, Inc., and remain under its control until attached to product found acceptable under the service.

COST OF SERVICE

The cost of the Label Service is defrayed by service charges which vary according to the nature and extent of the inspection needed and in direct proportion to the number of labels used. Underwriters' Laboratories, Inc. is established for service, not for profit. Accordingly, the service charges are adjusted from time to time, and subscribers to the service are notified of the current charge and all subsequent charges.

Manufacturers may obtain labels by placing an order with the Laboratories for the number and type of labels desired. EACH LABEL ORDER MUST BE ACCOMPANIED BY A REMITTANCE DRAWN PAYABLE TO UNDERWRITERS' LABORATORIES, INC. TO COVER THE SERVICE CHARGE.

NECESSARY CO-OPERATION FROM THE MANUFACTURER

The least cost at which the Factory Inspection and Label Service is operated necessitates the fullest measure of co-operation on the part of the manufacturer. The service is designed principally to act as a formal check on the supervision which the manufacturer exercises over his product. It is not designed to relieve the manufacturer of responsibility and cannot be utilized effectively in any case where the desire for earnest co-operation is not manifest.

The manufacturer is primarily responsible for the application of labels to such of his output as is found, by his own inspection, to comply with the requirements for the product set forth in the Label Service Procedure. The function of the Laboratories' inspector is to examine a sufficient portion of the labeled product to afford a reasonable and practical counter-check on the efficiency of the manufacturer's own inspection service.

The manufacturer shall make arrangements for the inspector to have free access, during hours in which the factory is in operation, to the test room assigned for his use and to any portion of the factory premises where the product or components thereof are being fabricated, processed, finished, or stored. The inspector shall be permitted to inspect and subject to prescribed tests, prior to shipment, any of the product, labeled or intended for labeling and the manufacturer shall extend to him all necessary privileges and assistance.

The manufacturer shall provide the required test equipment and facilities for conducting all tests described in the Procedure which are to be made at the factory. It is strongly recommended that such equipment be, as far as possible, as specified. If the manufacturer desires to provide special or additional equipment, its suitability will be investigated by the Laboratories. If it is found to be substantially the equivalent of the equipment specified, its use will be permitted with the understanding that in event of question or disagreement as to the results obtained with such special equipment, referee tests shall be conducted (at one of the Laboratories' testing stations, if necessary) with equipment as specified in the Procedure.

DALLAS COUNTY COURT REPORTER - SCOTT
PRODUCED BY NEW ESTABLISHMENT
IN MISSISSIPPI CASES 3/18/92

RESPONSIBILITIES AND DUTIES OF THE LABORATORIES' INSPECTOR

GENERAL:

The inspector shall deal directly with the person (or persons) designated by the manufacturer. Upon entering the factory, the inspector shall go to the person designated and arrange for the selection, as specified, of samples of the product to be inspected. The inspector will avoid entering any portion of the factory where the necessities of his work do not require his presence.

The inspector's principal duty is to satisfy himself that product shipped from the factory with labels attached has been inspected in accordance with the provisions of the Procedure. The manufacturer's program of production, inspection, tests, and shipping will usually be well known to the inspector, and if this program is effective, it may be regarded as largely assuring uniform compliance with the requirements of the Procedure. Hence, under normal conditions, the inspector's work will be that of counter-checking, as outlined hereafter, the products submitted by the manufacturer as suitable for labeling. If these conditions do not exist, the inspector will so inform the Superintendent of Label Service, who will advise him of the special program to be followed.

Originally, all details of the requirements shall be checked by the inspector at each inspection; but usually it will not be practical, nor should it be necessary, for the inspector to check each device in all particulars -- for example, one device may be examined in certain details, another in others, etc.

If the product is found to have features which make it unacceptable for labeling, when inspected under the provisions of the Procedure, the inspector shall require that suitable corrections be made if it is to be labeled. The inspector shall check subsequent production carefully for recurrence of such features until conditions again appear to be normal.

The inspector shall require that the manufacturer remove labels from all products which do not comply with requirements; except that in the event of disagreement between the manufacturer and inspector as to whether the product is acceptable, the manufacturer may hold the labeled material at the factory, pending an appeal to and a decision from the Superintendent of Label Service. Labels removed from rejected material shall be turned over to the inspector for destruction.

All failures to comply with the provisions of the Procedure shall be called immediately to the attention of the manufacturer and then confirmed in writing. For such confirmation, a form (Variation Notice) provided for the purpose shall be used and a duplicate shall be attached to the inspection report when it is forwarded to the Chicago Office.

The inspector shall not permit the attachment of labels to products not covered by the Label Service Procedure authorization, unless he has received special authorization from the Laboratories for such action.

INSPECTION REPORTS:

A report shall be made out for each factory inspection and forwarded promptly to the Chicago Office for review. The inspector shall indicate on the report form the results of the examination and tests made by him at each factory inspection. A copy of the report will not be furnished to the manufacturer.

The report shall indicate clearly all features found, in the examination or test of the product, not in compliance with the requirements of the Procedure. Any action taken by the inspector shall be recorded in the report.

Under "General Remarks" the inspector may advise as to his general impression of conditions at the factory with respect to the manufacture and inspection of the listed product, and any other items of general interest. If criticisms are recorded, he should state briefly what suggestions or recommendations he may have for correcting the situation, supplementing this by letter or telegram if necessary. The inspector shall advise briefly of improvements made in features criticized in this or previous reports, and of general improvements in workmanship, the arrangement and character of test apparatus, etc.