

INTERNATIONAL TRUCK AND ENGINE CORPORATION		
CEMS (CORPORATE ENGINEERING MATERIAL SPECIFICATION)		NUMBER: CEMS-DT-2
TITLE: Flame Resistance Test		CURRENT ISSUE DATE: October 2001
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<i>This specification may involve hazardous materials, equipment, and procedures. This specification does not purport to address all of the safety issues associated with its use. The user is responsible to consult appropriate safety and health practices and to determine the applicability of regulatory limits prior to use.</i>		
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1.0 SCOPE

This test is designed to determine the self-extinguishing quality of fiberglass reinforced laminates.

2.0 APPARATUS

- 2.1 7/16 inch Tirrell burner
- 2.2 Ring stand
- 2.3 Thermometer Clamp (Fisher 5-809 or equivalent)
- 2.4 Utility clamp, small size (Fisher 5-766 or equivalent)
- 2.5 Clamp holder (Fisher 5-756 or equivalent)
- 2.6 Stop watch
- 2.7 Hood
- 2.8 Micrometer 0 to 1 inch (0 to 25 mm).
- 2.9 Protractor

3.0 PROCEDURE

3.1 The test is to be used as a comparison of resins or fillers or other compounding ingredients. The glass content will be 30% $\pm$ 3% by weight, and the mat will be Owens Corning Fiberglas mat, treatment #16 or equivalent. If the test is to be used as a comparison of fabricated objects, thicknesses greater than 0.125 inch (3.2 mm) will be machined to the specified dimensions. Material will be removed from the back (non-appearance) surface.

3.2 It is particularly important that the burner flame be adjusted to a 1.5 inch (38 mm) inner blue cone with a flame height of 4 to 5 inches (100 to 125 mm). Care should be taken to have the axis of the burner at an angle of 20° from vertical. The burner should be clamped so that the flame may be easily applied and withdrawn from contact with the test sample.

3.3 Tests will be made under draft-free conditions (a fume hood with the mechanical ventilation turned off is acceptable).

3.4 The specimen will be clamped vertically so that the tip of the inner blue cone of the flame will just touch the lower edge of the 0.5-inch (13-mm) dimension of the specimen. The flame will be applied to the specimen and then removed according to the following schedule.

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Ignition	Flame On Time	Flame Off Time
	Seconds	Seconds
Step 1	5	10
Step 2	7	14
Step 3	10	20
Step 4	15	30
Step 5	25	50

3.5 Whenever the burning is observed to continue longer than the "off time", no further flame applications will be made to the specimen and the total burning time after removal of flame will be recorded. Burning time of over 120 seconds will be considered continuous and recorded as "C.B.". Record the number of flame applications and the time, in seconds, of continued burning after each application.

4.0 CALCULATIONS

4.1 If the test sample extinguishes within the allotted "flame off time", the sample passes that particular step. Each step passed is worth four (4) points.

4.2 The overall rating for the material will be determined by taking the grand total of successfully completed test steps for all five (5) samples and multiplying by four (4 x number of steps).

4.3 In the sample report shown below, the first and fourth samples passed three steps each, the second and third passed five steps each and the fifth sample passed two steps for a grand total of eighteen (18) steps and a 72 point rating.

5.0 REPORT

5.1 The actual burning time in seconds of each sample after each ignition step.

5.2 The overall flame retardancy rating of the material.

Sample Report:

BURNING TIMES AFTER IGNITION, SECONDS

Step Number	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
1	0	0	0	0	0
2	0	0	0	5	5
3	10	5	0	15	25
4	45	25	20	60	--
5	--	45	35	--	--

OVER ALL RATING = 72

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