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## Standards and Regulations Division

### TECHNICAL STANDARDS DOCUMENT

No. 302, Revision 0

# Flammability of Interior Materials

The text of this document is based on the U.S. *Code of Federal Regulations*, Title 49, Part 571, Federal Motor Vehicle Safety Standard No. 302, Flammability of Interior Materials, revised as of October 1, 2004.

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# Technical Standards Document Number 302, Revision 0

## Flammability of Interior Materials

*(Ce document est aussi disponible en français.)*

### Introduction

As defined by section 12 of the *Motor Vehicle Safety Act*, a Technical Standards Document (TSD) is a document that reproduces an enactment of a foreign government (e.g. a Federal Motor Vehicle Safety Standard issued by the U.S. National Highway Traffic Safety Administration). According to the Act, the *Motor Vehicle Safety Regulations* may alter or override some provisions contained in a TSD or specify additional requirements; consequently, it is advisable to read a TSD in conjunction with the Act and its counterpart Regulation. As a guide, where modifications have been made, the corresponding clause number is indicated in the margin of the TSD within parentheses.

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### Identification of Changes

In order to facilitate the incorporation of a TSD, certain non-technical changes may be made to the foreign enactment. These may include the deletion of words, phrases, figures, or sections that do not apply under the Act or Regulations, the conversion of imperial to metric units, the deletion of superseded dates, and minor changes of an editorial nature. Additions are underlined, and provisions that do not apply are ~~stroked through~~. Where an entire section has been deleted, it is replaced by: “[CONTENT DELETED]”. Changes are also made where there is a reporting requirement or reference in the foreign enactment that does not apply in Canada. For example, the name and address of the U.S. Department of Transportation are replaced by those of the Department of Transport.

### Effective Dates

The original version of a TSD comes into effect on the date that the regulation in which it is first incorporated by reference is published in the *Canada Gazette* Part II. Subsequent revisions of a TSD come into effect on the date of publication of the Notice of Revision in the *Canada Gazette* Part I. The Effective Date is that of the publication of the final amendment or the notice of revision in the *Canada Gazette*. Compliance with the requirements of a newly issued TSD is not mandatory until six months following the effective date, during which time it is permissible to continue to comply with the requirements of the previous Regulation or TSD. Manufacturers and importers must comply with the requirements of a newly issued TSD as of the Mandatory Compliance Date.

**Official Version of Technical Standards Documents**

Technical Standards Documents may be consulted electronically in both HTML and Portable Document Format (PDF) on the Department of Transport's Web site at [www.tc.gc.ca/RoadSafety/mvstm\\_tsd/index\\_e.htm](http://www.tc.gc.ca/RoadSafety/mvstm_tsd/index_e.htm). The PDF version is a replica of the TSD as published by the Department and is to be used for the purposes of legal interpretation and application. The HTML version is provided for information purposes only.

(Original signed by)

Director, Standards Research and Development  
for the Minister of Transport,  
Ottawa, Ontario

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**Flammability of Interior Materials**

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**S1. Scope**

This Technical Standards Document (TSD) standard specifies burn resistance requirements for materials used in the occupant compartments of motor vehicles.

**S2. Purpose**

The purpose of this TSD standard is to reduce the deaths and injuries to motor vehicle occupants caused by vehicle fires, especially those originating in the interior of the vehicle from sources such as matches or cigarettes.

(1) **S3. Application**

[CONTENT DELETED] For applicability, see Schedule III and section 302 of Schedule IV to the *Motor Vehicle Safety Regulations*.

**S3A. Definition**

**Occupant compartment air space** means the space within the occupant compartment that normally contains refreshable air. (*Espace d'air de l'habitacle*)

**S4. Requirements**

**S4.1** The portions described in S4.2 of the following components of vehicle occupant compartments shall meet the requirements of S4.3: Seat cushions, seat backs, seat belts, headlining, convertible tops, arm rests, all trim panels including door, front, rear, and side panels, compartment shelves, head restraints, floor coverings, sun visors, curtains, shades, wheel-housing covers, engine compartment covers, mattress covers, and any other interior materials, including padding and crash-deployed elements, that are designed to absorb energy on contact by occupants in the event of a crash.

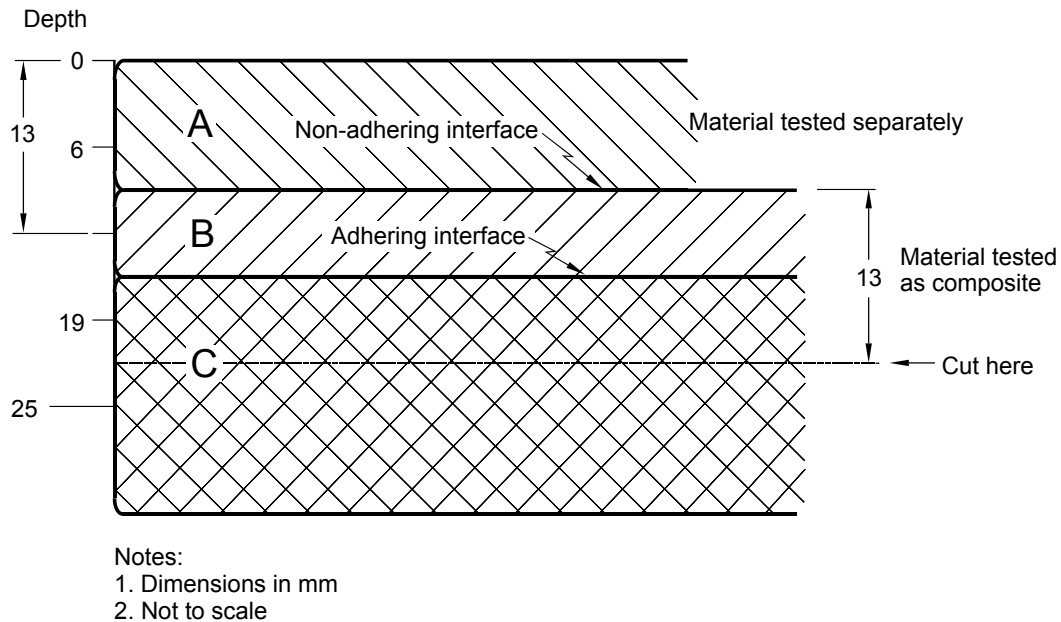
**S4.1.1** [Reserved]

**S4.2** Any portion of a single or composite material which is within 13 mm of the occupant compartment air space shall meet the requirements of S4.3.

**S4.2.1** Any material that does not adhere to other material(s) at every point of contact shall meet the requirements of S4.3 when tested separately.

**S4.2.2** Any material that adheres to other materials at every point of contact shall meet the requirements of S4.3 when tested as a composite with the other material(s).

### Occupant Compartment Air Space



Material A has a non-adhering interface with material B and is tested separately. Part of material B is within 13 mm of the occupant compartment air space, and materials B and C adhere at every point of contact; therefore, B and C are tested as a composite. The cut is in material C as shown, to make a specimen 13 mm thick.

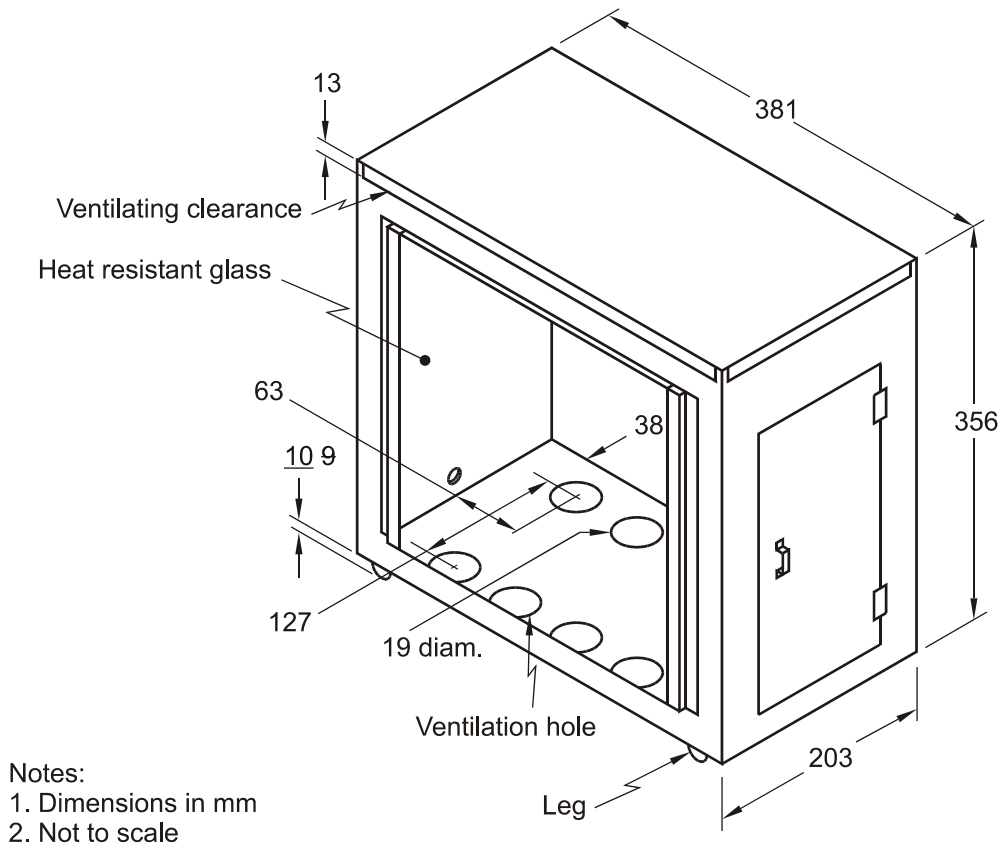
### S4.3

- (a) When tested in accordance with S5, material described in S4.1 and S4.2 shall not burn, nor transmit a flame front across its surface, at a rate of more than 102 mm per minute. The requirement concerning transmission of a flame front shall not apply to a surface created by cutting a test specimen for purposes of testing pursuant to S5.
- (b) If a material stops burning before it has burned for 60 seconds from the start of timing, and has not burned more than 51 mm from the point where the timing was started, it shall be considered to meet the burn-rate requirement of S4.3(a).

### S5.1 Conditions

**S5.1.1** The test is conducted in a metal cabinet for protecting the test specimens from drafts. The interior of the cabinet is 381 mm long, 203 mm deep, and 356 mm high. It has a glass observation window in the front, a closable opening to permit insertion of the specimen holder, and a hole to accommodate tubing for a gas burner. For ventilation, it has a 13-mm clearance space around the top of the cabinet, ten holes in the base of the cabinet, each hole

19 mm in diameter, and legs to elevate the bottom of the cabinet by 10 mm, all located as shown in Figure 1.



**Figure 1**

**S5.1.2** Prior to testing, each specimen is conditioned for 24 hours at a temperature of 21°C and a relative humidity of 50 percent, and the test is conducted under those ambient conditions.

**S5.1.3** The test specimen is inserted between two matching U-shaped frames of metal stock 25 mm wide and 10 mm high. The interior dimensions of the U-shaped frames are 51 mm wide by 330 mm long. A specimen that softens and bends at the flaming end so as to cause erratic burning is kept horizontal by supports consisting of thin, heat-resistant wires spanning the width of the U-shaped frame under the specimen at 25-mm intervals. A device that may be used for supporting this type of material is an additional U-shaped frame, wider than the U-shaped frame containing the specimen, spanned by 0.254-mm (10-mil) wires of heat-resistant composition at 25-mm intervals, inserted over the bottom U-shaped frame.

**S5.1.4** A bunsen burner with a tube of 10-mm inside diameter is used. The gas adjusting valve is set to provide a flame, with the tube vertical, of 38 mm in height. The air inlet to the burner is closed.

**S5.1.5** The gas supplied to the burner has a flame temperature equivalent to that of natural gas.

## S5.2 Preparation of Specimens

**S5.2.1** Each specimen of material to be tested shall be a rectangle 102 mm wide by 356 mm long, wherever possible. The thickness of the specimen is that of the single or composite material used in the vehicle, except that if the material's thickness exceeds 13 mm, the specimen is cut down to that thickness measured from the surface of the specimen closest to the occupant compartment air space. Where it is not possible to obtain a flat specimen because of surface curvature, the specimen is cut to not more than 13 mm in thickness at any point. The maximum available length or width of a specimen is used where either dimension is less than 356 mm or 102 mm, respectively, unless surrogate testing is required under S4.1.1.

**S5.2.2** The specimen is produced by cutting the material in the direction that provides the most adverse test results. The specimen is oriented so that the surface closest to the occupant compartment air space faces downward on the test frame.

**S5.2.3** Material with a napped or tufted surface is placed on a flat surface and combed twice against the nap with a comb having seven to eight smooth, rounded teeth per 25 mm.

## S5.3 Procedure

- (a) Mount the specimen so that both sides and one end are held by the U-shaped frame, and one end is even with the open end of the frame. Where the maximum available width of a specimen is not more than 51 mm, so that the sides of the specimen cannot be held in the U-shaped frame, place the specimen in position on wire supports as described in S5.1.3, with one end held by the closed end of the U-shaped frame.
- (b) Place the mounted specimen in a horizontal position in the center of the cabinet.
- (c) With the flame adjusted according to S5.1.4, position the bunsen burner and specimen so that the center of the burner tip is 19 mm below the center of the bottom edge of the open end of the specimen.
- (d) Expose the specimen to the flame for 15 seconds.
- (e) Begin timing (without reference to the period of application of the burner flame) when the flame from the burning specimen reaches a point 38 mm from the open end of the specimen.
- (f) Measure the time that it takes the flame to progress to a point 38 mm from the clamped end of the specimen. If the flame does not reach the specified end point, time its progress to the point where flaming stops.
- (g) Calculate the burn rate from the formula:

$$B = 60 \times \frac{D}{T}$$

where:

B = Burn rate in millimeters per minute

D = Length the flame travels in millimeters, and

T = Time in seconds for the flame to travel D millimeters.