



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
MEETING OF THE WORKING GROUP OF THE WHOLE**

Auckland, New Zealand, 4 to 8 May 2009

- Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2011/2012 Edition**
- 2.3: Part 3 — Dangerous Goods List, Special Provisions and Limited and Excepted Quantities**

TRANSPORT OF LIMITED QUANTITIES AND CONSUMER COMMODITIES

(Presented by R. Richard)

SUMMARY

This paper proposes amendments for consideration by the working group with respect to the transport of limited quantities and consumer commodities, taking into account recent revisions to Chapter 3.4 of the UN Model Regulations.

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 At DGP-WG/08 (The Hague, Netherlands 4 to 8 November 2008), the work of the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods was considered with respect to dangerous goods in limited quantities. As a result of these discussions, the working group submitted a paper entitled “Provisions applicable to limited quantities” (UN/SCETDG/34/INF.13) for consideration by the UN Sub-Committee at its 34th Session. The working paper suggested revisions to the proposed amendment to Chapter 3.4 of the UN Model Regulations taking into account the considerations necessary for transport of limited quantities by air. These proposals received broad support from the UN Sub-Committee and were adopted with minor revisions (see UN/SCETDG/34/INF.61).

1.2 The goal of this working paper is to present options for consideration by the working group regarding consequential amendments to the Technical Instructions to harmonize with the revised provisions for limited quantities that will appear in the UN Model Regulations, 16th Revised Edition.

1.3 Four proposals are offered for consideration:

1.3.1 **Proposal 1** is a consequential amendment to the note preceding Part 3;4 of the Technical Instructions which takes into account the amended marking adopted within the UN Model Regulations

and highlights certain additional requirements of the Technical Instructions relative to transport of limited quantities by air.

1.3.2 **Proposal 2** seeks to amend Part 3;4 of the Technical Instructions to include a reference to a new marking for limited quantity packages which would replace the currently required “limited quantities” or “LTD QTY” text marking in Part 5;2.4.11. This proposal would harmonize the provisions of the Technical Instructions with the text adopted by the UN Sub-Committee. In addition, text referring to the UN#/diamond marking in Part 5;2.4.1.1 would be deleted as this marking is no longer recognized in the UN Model Regulations.

1.3.3 **Proposal 3** suggests to delete the requirement in Part 5;4.1.5.2 for the words “Limited Quantity” or “LTD QTY” on the transport document. An indication on the documentation appears to add no value given that limited quantities are subject to all of the same hazard identification, loading, segregation, and other such requirements as non-limited quantity shipments of dangerous goods. In addition, shipments of limited quantities are readily identifiable via their assigned “Y” packing instruction number which must be shown on the transport document per Part 5;4.1.5.8.1 a). While it is understood that 3.4.10 of the UN Model Regulations currently states that when transported by sea or air the words “limited quantity” or “LTD QTY” shall be included on the transport document, this recommendatory text in the UN Model Regulations was based on the existing requirements of the Technical Instructions and the IMDG Code. If the Technical Instructions were amended to remove the requirement, it would be proposed to the UN Sub-Committee that the UN Model Regulations be amended accordingly. It should further be noted that a search of the Technical Instructions indicates no State variations that limit the acceptance of dangerous goods in limited quantities, but we did find fourteen operator variations that fully or partially prohibit acceptance of limited quantity shipments. Taking into account the advances made in multi-modal harmonization that have now established a consistent global standard for these types of packages, inter-modal recognition should be greatly improved. Therefore, additional text on the shipping document seems unnecessary for safety or facilitation purposes.

1.3.4 **Proposal 4** seeks to authorize the use of the new marking for consumer commodities prepared in accordance with Packing Instruction 910. It should be noted that the revisions to Chapter 3.4 of the UN Model Regulations included removal of the distinction between limited quantities prepared for consumer use and other limited quantities. This was easily accomplished within the UN Model Regulations because, other than an additional marking exception for materials packaged for consumer use, all of the relevant provisions (i.e. authorized Classes, quantities, packaging, etc.) were identical. While it is not possible to remove this distinction within the Technical Instructions, the goal of the panel should include facilitating the transport of consumer commodities by other modes. To that end, this paper presents two options for consumer commodity packages prepared for air transport to be either required or permitted to bear the new mark. The marking is especially important for consumer commodities due to the fact that the ID8000 identifier is not recognized in any regulation other than the Technical Instructions.

1.3.4.1 Proposal 4 contains two options for consideration to ensure multimodal harmony for the transport of consumer commodities:

- a) **Option 1** would align the provisions for consumer commodities with the conditions of Part 3;4 of the Technical Instructions and require the new limited quantity marking on all packages prepared in accordance with Packing Instruction 910. This approach further aligns with the UN Model Regulations in that it harmonizes the packaging and marking requirements for limited quantity packages, while retaining a classification option of Consumer Commodity, Class 9 within the Technical Instruction. An analysis of the requirements of Packing Instruction 910 has shown that by nature such packages meet most of the required conditions of Part 3;4 other than those provisions from which they are specifically excluded (for example

Packing Instruction 910 does not require compliance with Part 4;1 or Part 6). The analysis showed that the only noteworthy requirement currently in Part 3;4 not also addressed in Packing Instruction 910 is the stacking test in Part 3;4.4.2. Therefore Option 1 introduces this requirement to Packing Instruction 910 as well as a requirement to apply the new marking. Packing Instruction 910 would be renumbered Packing Instruction Y910.

- b) Option 2 would authorize rather than require the new marking for such packages while maintaining the current requirements of Packing Instruction 910. The new marking would be permitted only when such packages in addition meet all of the conditions of Part 3;4.

2. **ACTION BY THE DGP-WG**

2.1 The DGP-WG is invited to consider:

2.2 **Proposal 1**

2.2.1 Amend the note preceding Part 3;4 to read as follows:

Chapter 4

DANGEROUS GOODS IN LIMITED QUANTITIES

Note.— The UN Recommendations contain provisions for limited quantities of dangerous goods. These recognize that many dangerous goods when in reasonably limited quantities present a reduced hazard during transport and can safely be carried in good quality packagings of the types specified in the Recommendations but which have not been tested and marked accordingly. The provisions contained in this paragraph are based on those in the UN Recommendations and allow limited quantities of dangerous goods to be transported in packagings which, although not tested and marked in accordance with Part 6 of these Instructions, do meet the construction requirements of that part. The UN Recommendations require packages containing limited quantities of dangerous goods to be marked with a diamond shaped mark as specified in Chapter 3.4 of the UN Model Regulations. The mark required by these Instructions includes all of the elements of this mark with the addition of a “Y” which indicates compliance with the provisions of these Instructions, some of which are more stringent than those of the UN Model Regulations and of other modes. For example, packages transported in accordance with these Instructions require hazard labels, and inner package and per-package quantities are in some cases lower than those authorized by the UN Model Regulations. The UN Model Regulations recognize the mark required by these Instructions in order to ensure that packages containing limited quantities of dangerous goods prepared in accordance with these Instructions are acceptable for transport by other modes.

2.3 **Proposal 2**

2.3.1 Amend Part 3;4.5.2 of the Technical Instructions to read as follows:

4.5 PACKAGE MARKING

...

4.5.2 Packages containing limited quantities of dangerous goods and prepared in accordance with this chapter must be **durably and legibly** marked “limited quantity(ies)” or “LTD QTY” **with the mark shown in Figure 5-3 (see 5:2.4.11).**

2.3.2 Amend 5;2.4.1.1 as follows:

2.4 MARKING SPECIFICATIONS AND REQUIREMENTS

2.4.1 Marking with proper shipping name and UN number

2.4.1.1 Unless otherwise provided in these Instructions, the proper shipping name of the dangerous goods (supplemented with the technical name(s) if appropriate, see Part 3, Chapter 1) and, when assigned, the corresponding UN number preceded by the letters "UN" must be displayed on each package. In the case of unpackaged articles, the marking must be displayed on the article, on its cradle or on its handling, storage or launching device. A typical package marking would be:

"Corrosive liquid, acidic, organic, n.o.s. (caprylyl chloride) UN 3265".

~~For packages containing limited quantities of dangerous goods, the UN number (preceded by the letters "UN") may be placed within a diamond. If the diamond marking is applied, the following requirements must be met. The width of the line forming the diamond must be at least 2 mm; the number must be at least 6 mm high. When more than one substance is included in the package and the substances are assigned to different UN numbers, then the diamond must be large enough to include each relevant UN number.~~

~~# Note. It is anticipated that displaying the UN number within a diamond for packages containing limited quantities of dangerous goods will become mandatory as of 1 January 2011.~~

2.3.3 Amend 5;2.4.11 to read as follows:

2.4.11 Additional markings of packages containing dangerous goods in limited quantities

Packages containing limited quantities of dangerous goods and prepared in accordance with 3;4 must be durably and legibly marked "limited quantity(ies)" or "LTD QTY" with the mark shown in Figure 5-3.

2.3.4 Add a new Figure 5-3 following Part 5;2.4.11 as follows:

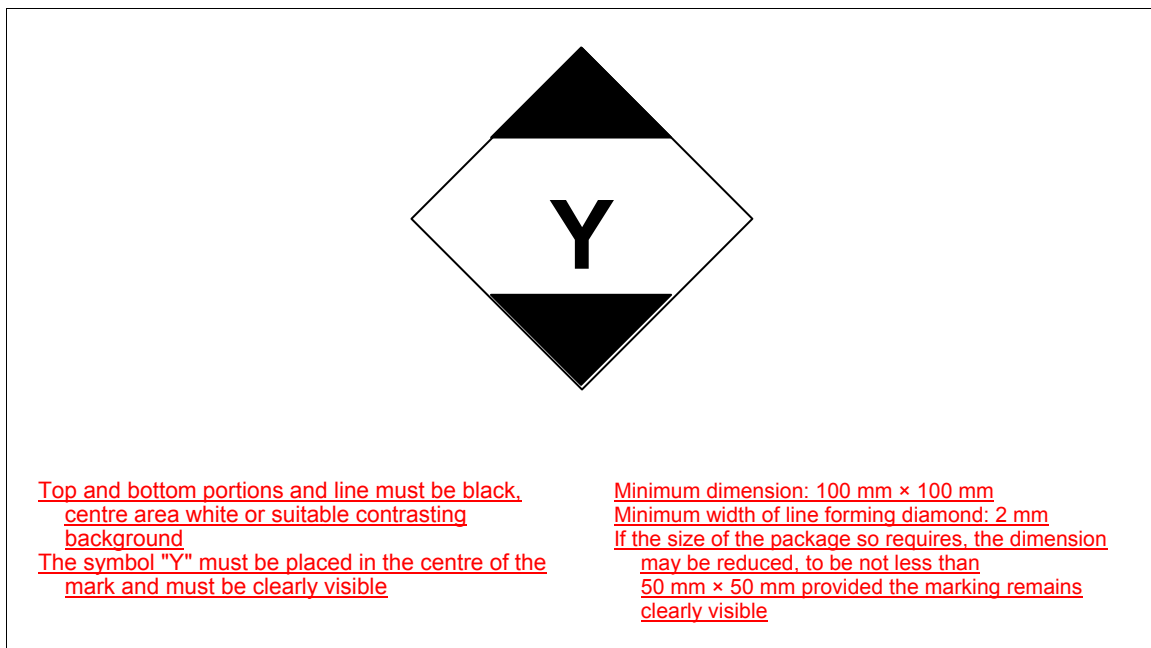


Figure 3-1. Limited quantities mark

2.4 **Proposal 3**

2.4.1 Delete 5;4.1.5.2 in its entirety:

4.1.5 Information required in addition to the dangerous goods description

...

~~4.1.5.2 Limited quantities~~

~~When dangerous goods are transported according to the exceptions for dangerous goods packed in limited quantities, the words "Limited quantity" or "LTD QTY" must be included.~~

2.5 **Proposal 4, Option 1**

2.5.1 Amend Packing Instruction 910 as follows:

<u>Y910</u>	PACKING INSTRUCTION <u>Y910</u>	<u>Y910</u>
<p>Consumer commodities are materials that are packaged and distributed in a form intended or suitable for retail sale for purposes of personal care or household use. These include items administered or sold to patients by doctors or medical administrations. Except as otherwise provided below, dangerous goods packed in accordance with this packing instruction do not need to comply with 4;1 or Part 6 of these Instructions; they must, however, comply with all other applicable requirements.</p> <p>a) Each packaging must be designed and constructed to prevent leakage that may be caused by changes in altitude and temperature during air transport.</p> <p>b) Inner packagings that are breakable (such as earthenware, glass or brittle plastic) must be packed to prevent breakage and leakage under conditions normally incident to transport. These completed packagings must be capable of withstanding a 1.2 m drop on solid concrete in the position most likely to cause damage. <u>Each package offered for transport must be capable of withstanding, without breakage or leakage of any inner packaging and without significant reduction of effectiveness, a force applied to the top surface for a duration of 24 hours equivalent to the total weight of identical packages if stacked to a height of 3 m (including the test sample).</u></p> <p>c) When filling receptacles for liquids, sufficient ullage (outage) must be left to ensure that neither leakage nor permanent distortion of the receptacle will occur as a result of an expansion of the liquid caused by temperatures likely to prevail during transport. Unless specific requirements are prescribed in national rules or international agreements, liquids must not completely fill a receptacle at a temperature of 55°C. At this temperature a minimum ullage of 2 per cent should be left. The primary packaging (which may include composite packaging), for which retention of the liquid is a basic function, must be capable of withstanding, without leakage, an internal pressure which produces a pressure differential of not less than 75 kPa or a pressure related to the vapour pressure of the liquid to be conveyed, whichever is the greater. The pressure related to the vapour pressure must be determined by the method shown in 4;1.1.6. Tests on sample receptacles must be carried out to demonstrate the capability of the primary packaging to withstand the above pressure.</p> <p>d) Stoppers, corks or other such friction-type closures must be held securely, tightly and effectively in place by positive means. The closure device must be so designed that it is extremely improbable that it can be incorrectly or incompletely closed and must be such that it may be easily checked to determine that it is completely closed.</p> <p>e) Inner packagings must be tightly packed in strong outer packagings and must be so packed, secured or cushioned as to prevent any breakage, puncture or leakage of contents into the outer packaging(s) during normal conditions of transport. Absorbent material must be provided for glass or earthenware inner packaging(s) containing consumer commodities in Class 2 or 3 or liquids of Division 6.1, in sufficient quantity to absorb the liquid contents of the largest of such inner packagings contained in the outer packaging. Absorbent and cushioning material must not react dangerously with the contents of the inner packagings. Notwithstanding the above, absorbent material may not be required if the inner packagings are so protected that breakage of the inner packagings and leakage of their contents from the outer packaging will not occur during normal conditions of transport.</p> <p>f) Inner packagings containing liquids, excluding flammable liquids in inner packagings of 120 mL or less, must be packed with their closures upward and the upright position of the package must be indicated by "Package orientation" labels (Figure 5-26). These labels, or pre-printed package orientation labels meeting the same specification as either Figure 5-26 or ISO Standard 780-1997, must be affixed to, or printed on, at least two opposite vertical sides of the package with the arrows pointing in the correct direction.</p>		

- g) Each completed package as prepared for shipment must not exceed a gross mass of 30 kg G.
- h) Class 2 substances must be further limited to aerosol products containing non-toxic compressed or liquefied gas(es) that are necessary to expel liquids, powders or pastes, packed in inner non-refillable non-metal receptacles not exceeding 120 mL capacity each, or in inner non-refillable metal receptacles not exceeding 820 mL capacity each (except that flammable aerosols must not exceed 500 mL capacity each), subject in either case to the following provisions:
- 1) the pressure in the aerosol must not exceed 1 500 kPa at 55°C and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55°C;
 - 2) if the pressure in the aerosol exceeds 970 kPa at 55°C but does not exceed 1 105 kPa at 55°C, an inner IP.7, IP.7A or IP.7B metal receptacle must be used;
 - 3) if the pressure in the aerosol exceeds 1 105 kPa at 55°C but does not exceed 1 245 kPa at 55°C, an IP.7A or IP.7B metal receptacle must be used;
 - 4) if the pressure in the aerosol exceeds 1 245 kPa at 55°C, an IP.7B metal receptacle must be used;
 - 5) IP.7B metal receptacles having a minimum burst pressure of 1 800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated in 1), 2), 3) or 4) do not apply to the pressure within the capsule. The quantity of gas contained in the capsule must be so limited such that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into an aerosol;
 - 6) the liquid contents must not completely fill the closed receptacle at 55°C;
 - 7) each aerosol exceeding 120 mL capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect; and
 - 8) the valves must be protected by a cap or other suitable means during transport.
- i) For aerosols containing a biological or medical preparation which will be deteriorated by a heat test and which are non-toxic and non-flammable, packed in inner non-refillable receptacles not exceeding 575 mL capacity each, the following provisions are applicable:
- 1) the pressure in the aerosol must not exceed 970 kPa at 55°C;
 - 2) the liquid contents must not completely fill the closed receptacle at 55°C;
 - 3) one aerosol out of each lot of 500 or less must be heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect; and
 - 4) the valves must be protected by a cap or other suitable means during transport.
- j) Except for aerosols, inner packagings must not exceed:
- 1) 500 mL for liquids; and
 - 2) 500 g for solids.
- k) Consumer commodities shipped according to these provisions may be shipped in a unit load device or other type of pallet prepared by a single shipper provided they contain no other dangerous goods. The shipper must provide the operator with written documentation stating the number of packages of consumer commodities contained in each unit load device or other type of pallet.
- l) The gross mass on the dangerous goods transport document must be shown as:
- 1) for one package, the actual gross mass of the package;
 - 2) for more than one package, either the actual gross mass of each package or as the average mass of the packages. (For example, if there are 10 packages and the total gross mass of them is 100 kg, the dangerous goods transport document may show this as "average gross mass per package 10 kg".)
- m) Packages prepared in accordance with these provisions must be durably and legibly marked with the mark shown in Figure 5-3.

2.6 **Proposal 4, Option 2**

2.6.1 Amend Packing Instruction 910 as follows:

910	PACKING INSTRUCTION 910	910
<p>a) Each packaging must be designed and constructed to prevent leakage that may be caused by changes in altitude and temperature during air transport.</p> <p>b) Inner packagings that are breakable (such as earthenware, glass or brittle plastic) must be packed to prevent breakage and leakage under conditions normally incident to transport. These completed packagings must be capable of withstanding a 1.2 m drop on solid concrete in the position most likely to cause damage.</p> <p>c) When filling receptacles for liquids, sufficient ullage (outage) must be left to ensure that neither leakage nor permanent distortion of the receptacle will occur as a result of an expansion of the liquid caused by temperatures likely to prevail during transport. Unless specific requirements are prescribed in national rules or international agreements, liquids must not completely fill a receptacle at a temperature of 55°C. At this temperature a minimum ullage of 2 per cent should be left. The primary packaging (which may include composite packaging), for which retention of the liquid is a basic function, must be capable of withstanding, without leakage, an internal pressure which produces a pressure differential of not less than 75 kPa or a pressure related to the vapour pressure of the liquid to be conveyed, whichever is the greater. The pressure related to the vapour pressure must be determined by the method shown in 4;1.1.6. Tests on sample receptacles must be carried out to demonstrate the capability of the primary packaging to withstand the above pressure.</p> <p>d) Stoppers, corks or other such friction-type closures must be held securely, tightly and effectively in place by positive means. The closure device must be so designed that it is extremely improbable that it can be incorrectly or incompletely closed and must be such that it may be easily checked to determine that it is completely closed.</p> <p>e) Inner packagings must be tightly packed in strong outer packagings and must be so packed, secured or cushioned as to prevent any breakage, puncture or leakage of contents into the outer packaging(s) during normal conditions of transport. Absorbent material must be provided for glass or earthenware inner packaging(s) containing consumer commodities in Class 2 or 3 or liquids of Division 6.1, in sufficient quantity to absorb the liquid contents of the largest of such inner packagings contained in the outer packaging. Absorbent and cushioning material must not react dangerously with the contents of the inner packagings. Notwithstanding the above, absorbent material may not be required if the inner packagings are so protected that breakage of the inner packagings and leakage of their contents from the outer packaging will not occur during normal conditions of transport.</p> <p>f) Inner packagings containing liquids, excluding flammable liquids in inner packagings of 120 mL or less, must be packed with their closures upward and the upright position of the package must be indicated by "Package orientation" labels (Figure 5-26). These labels, or pre-printed package orientation labels meeting the same specification as either Figure 5-26 or ISO Standard 780-1997, must be affixed to, or printed on, at least two opposite vertical sides of the package with the arrows pointing in the correct direction.</p> <p>g) Each completed package as prepared for shipment must not exceed a gross mass of 30 kg G.</p> <p>h) Class 2 substances must be further limited to aerosol products containing non-toxic compressed or liquefied gas(es) that are necessary to expel liquids, powders or pastes, packed in inner non-refillable non-metal receptacles not exceeding 120 mL capacity each, or in inner non-refillable metal receptacles not exceeding 820 mL capacity each (except that flammable aerosols must not exceed 500 mL capacity each), subject in either case to the following provisions:</p> <ol style="list-style-type: none">1) the pressure in the aerosol must not exceed 1 500 kPa at 55°C and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55°C;2) if the pressure in the aerosol exceeds 970 kPa at 55°C but does not exceed 1 105 kPa at 55°C, an inner IP.7, IP.7A or IP.7B metal receptacle must be used;3) if the pressure in the aerosol exceeds 1 105 kPa at 55°C but does not exceed 1 245 kPa at 55°C, an IP.7A or IP.7B metal receptacle must be used;4) if the pressure in the aerosol exceeds 1 245 kPa at 55°C, an IP.7B metal receptacle must be used;5) IP.7B metal receptacles having a minimum burst pressure of 1 800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated in 1), 2), 3) or 4) do not apply to the pressure within the capsule. The quantity of gas contained in the capsule must be so limited such that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into an aerosol;		

- 6) the liquid contents must not completely fill the closed receptacle at 55°C;
 - 7) each aerosol exceeding 120 mL capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect; and
 - 8) the valves must be protected by a cap or other suitable means during transport.
- i) For aerosols containing a biological or medical preparation which will be deteriorated by a heat test and which are non-toxic and non-flammable, packed in inner non-refillable receptacles not exceeding 575 mL capacity each, the following provisions are applicable:
- 1) the pressure in the aerosol must not exceed 970 kPa at 55°C;
 - 2) the liquid contents must not completely fill the closed receptacle at 55°C;
 - 3) one aerosol out of each lot of 500 or less must be heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect; and
 - 4) the valves must be protected by a cap or other suitable means during transport.
- j) Except for aerosols, inner packagings must not exceed:
- 1) 500 mL for liquids; and
 - 2) 500 g for solids.
- k) Consumer commodities shipped according to these provisions may be shipped in a unit load device or other type of pallet prepared by a single shipper provided they contain no other dangerous goods. The shipper must provide the operator with written documentation stating the number of packages of consumer commodities contained in each unit load device or other type of pallet.
- l) The gross mass on the dangerous goods transport document must be shown as:
- 1) for one package, the actual gross mass of the package;
 - 2) for more than one package, either the actual gross mass of each package or as the average mass of the packages. (For example, if there are 10 packages and the total gross mass of them is 100 kg, the dangerous goods transport document may show this as "average gross mass per package 10 kg".)
- m) Packages prepared in accordance with these provisions and meeting the conditions of Chapter 3:4 may be durably and legibly marked with the mark shown in Figure 5-3.