भारतीय मानक Indian Standard

लेदर गौंटलेट्स और मिट्टेंस — विशिष्टि

IS 2573: 2023

(तीसरा पुनरीक्षण)

Leather Gauntlets and Mittens — Specification

(Third Revision)

ICS 59.140.35

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भारतीय मानक ब्यूरो BUREAU OF INDIAN STANDARDS

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FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Leather, Tanning Materials and Allied Products Sectional Committee had been approved by the Chemical Division Council.

Leather gauntlets are generally worn by welders for protection against heat and abrasion during welding and by workers in iron and steel industry while handling moderately hot materials and materials having sharp and rough edges. Leather mittens are worn by workers in the iron and steel industry while handling moderately hot material and material having sharp and rough edges.

Realising the important role of leather gauntlets and mittens, the Indian Standard on the subject was originally published in 1963. Related standards published simultaneously were IS 2574: 1963 and IS 2575: 1963. To facilitate use of these standards, the first revision of the standard was published in 1975, amalgamating the three standards and consequent withdrawal of IS 2574: 1963 and IS 2575: 1963.

The second revision of the standard was in view of recent developments in trade and technology and experience gained through the operation of ISI Certification Marks Scheme on the product. In the second revision, only the critical requirements of the components of the gauntlets and mittens were prescribed.

The Committee felt a need to revise the standard with a view to update the standard based on the experience of last three decades and on the currently available data.

In this revision, heat resistance test has been included in the standard and the requirement of material for leather has been also revised. The relevant clauses have been added and the references have been updated.

The composition of the Committee responsible for formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

LEATHER GAUNTLETS AND MITTENS — SPECIFICATION

(Third Revision)

1 SCOPE

This standard prescribes the requirements of leather gauntlets and mittens for workers in the iron and steel industry and welders while handling moderately hot materials, or materials having rough and sharp edges, and during gas/electric welding or cutting.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Indian Standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

3 TERMINOLOGY

For the purpose of this standard, the following definitions and those given in IS 1640 shall apply.

- **3.1 Guff** The extension of a gauntlet or mitten which covers the wrist.
- **3.2 Hand Part** The palm including the index finger and the inner portions consisting of the second, third and fourth fingers.

4 TYPES

- **4.1** This standard covers three types of products, according to use, namely:
 - a) Type 1 leather gauntlets for welders;
 - b) *Type* 2 leather gauntlets for workers in iron and steel industry; and
 - c) Type 3 leather mittens for workers in iron and steel industry.
- **4.2 Sizes of Leather Gauntlets for Welders** The following three sizes of leather gauntlets for welders are recommended on the basis of the total length, L (*see* Fig. 1):

Sl No.	Size	Length
		L
		(mm)
(1)	(2)	(3)
i)	Small	300 ± 5
ii)	Medium	350 ± 5
iii)	Large	400 ± 5

5 REQUIREMENTS

5.1 The three types shall be made to the shape and design as shown in Fig. 1 to Fig. 3.

The various dimensions of the gauntlets and mittens shall be as given in the respective figures with a tolerance of -2 mm to +4 mm on all the dimensions prescribed.

5.2 Materials

The three types shall be manufactured with the materials as specified in **5.2.1** to **5.2.3**.

5.2.1 Leather

The leather shall be grain cowhide/buffalohide, buffed grain cowhide/buffalohide, grain deerskin, grain pigskin, grain horsehide or grain goatskin conforming to the following requirements shall be used:

- a) The leather and flesh split shall have minimum thickness of 1.0 mm and maximum thickness of 1.5 mm:
- It shall be soft, pliable and free from flaws, cuts, holes and loose fibres:
- c) It shall be treated so as not to obscure defects and shall not be stained with compounds of iron;
- d) In case of grain leather, it shall not crack on the grain side when bent grain outwards round a mandrel of 1.5 mm diameter through an angle of 180 degrees;
- e) The leather shall not contain any chromate extractable by water or dilute acids;
- f) The leather shall be treated for mildew resistance:
- g) Cuff shall be of sufficient stiffness to be self supporting with a minimum thickness of 1.2 mm and a maximum thickness of 1.78 mm;
- h) For the hand part and the inner face of the cuff, the leather and flesh split shall be of natural colour. The outer face of the cuff and strengthening pieces may be printed and shall be of natural shade or dyed to any shade as agreed to between the buyer and the supplier;

- j) The flesh side of leather shall be well buffed for Types 2 and 3; and
- k) The leather shall also comply with the requirements given in Table 1.

Table 1 Requirements for Leather

(Clause 5.2.1)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Solvent exractable substances percent by mass, <i>Max</i>	5	LC: 4 of IS 582
ii)	Chromium content (as Cr ₂ O ₃) percent by mass, <i>Min</i>	2.5	IS 582 (Part 10/Sec 1) or IS 582 (Part 10/Sec 4)
iii)	pH of aqueous extract	Not below 3.5	IS 582 (Part 9)
iv)	Double hole stitch tear strength, kg/cm, <i>Min</i>	50	LP: 8 of IS 5914
v)	Shrinkage temperature, °C, Min	90	LP: 10 of IS 5914
vi)	Abrasion Resistance	_	_
	Dry condition	shall not develop any hole Before 25 600 cycles	IS 5914 (Part 2/Sec 1) : 2017 or
	Wet Condition	shall not develop any hole Before 12 800 cycles	IS 5914 (Part 2/Sec 2) : 2017 or 6.12 of IS 15298 (Part 1)

NOTE — All requirements are to be calculated on zero percent volatile matter basis except Sl No. (iii), (iv) and (v). Volatile matter shall be determined as prescribed in IS 582 (Part 1): 2017.

5.2.2 *Thread*

Cotton, polyamide-cotton core spun or any other suitable thread shall be used. For Type 1 material, the thread used shall comply with the requirements given in col (3) of Table 2. For Type 2 and Type 3 materials, the thread shall comply with the requirements given in col (4) of Table 2.

Table 2 Requirements for Thread for Use in Leather Gauntlets and Mittens

(Clause 5.2.2)

Sl No.	Characteristic	Requirement for Thread for Use in		Method of Test, Ref to	
		Type 1 Material	Type 2 and 3 Material		
(1)	(2)	(3)	(4)	(5)	
i)	Length, m/Kg, Min	21 170	10 720	Annex B of IS 1720	
ii)	Single thread breaking load, Newtons, <i>Min</i>	10.8	21.1	IS 1670	

5.2.3 *Canvas*

Cotton canvas, undyed, with the constructional particulars given in Table 3, shall be used for the manufacture of the cuff and outer face of the gauntlets in case of Type 2 and the cuff and back portion of the mitten and its gauntlet portion in case of Type 3.

Table 3 Requirements for Cotton Canvas

(Clause 5.2.3)

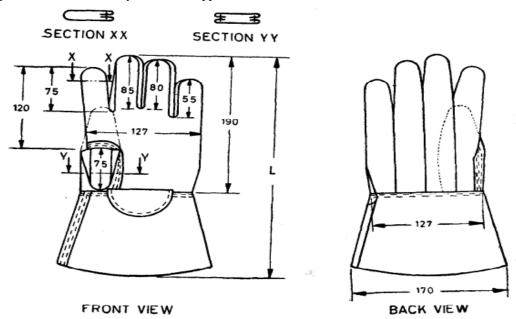
Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Weave	Oxford	_
ii)	Count of yarns (approximate),	_	_
	a) Warp	20 s/2	_
	b) Weft	22 s/2	_
iii)	Ends/cm	36 ± 2	IS 1963
iv)	Picks/cm	19 ± 1	IS 1963
v)	Mass, g/m ²	410 ± 20.5	IS 1964
vi)	Breaking load on 5 cm \times 20 cm Raveled strips, Min	_	IS 1969 (Part 1): 2018 and 1969 (Part 2): 2018
	a) Warpway	1 370	_
	b) Weftway	1 080	

5.3 Manufacture

5.3.1 *Type* 1

5.3.1.1 The size of leather gauntlets for welders shall be as agreed to between the buyer and the supplier.

The three sizes given in **5.2**, however, have been recommended to cover varying lengths of cuff. The dimensions are shown in Fig. 1 with tolerances as given in **5.1.1**.



All dimensions in millimetres.

Fig. 1 Leather Gauntlets for Welders

- **5.3.1.2** The hand part shall be cut from the piece of undyed leather and back portion including second, third and fourth fingers from different pieces of undyed leather.
- **5.3.1.3** The three different pieces of back portion shall be assembled and stitched together along the edges by a row of stitches. The back thus formed shall be secured with the corresponding front pieces (palm side) of the fingers with a row of stitches. The thumb shall be made from two pieces of undyed leather and closed with the hand part by a seam. The seam of the thumb shall be reinforced by a strip of leather and secured by two rows of stitches.
- **5.3.1.4** The hand part shall be made with the flesh side up and the grain side to remain in contact with the hand.
- **5.3.1.5** The cuff portion shall be made from two pieces of leather, the inner portion being of leather, chrome tanned, natural colour and the outer portion made of chrome tanned leather, with grain side out.
- **5.3.1.6** Two pieces of leather shall be seemed together by a single row of stitches on the finger side arid two rows of stitches on the thumb side. The cuff part thus formed shall be secured with the hand part by two rows of stitches.
- **5.3.1.7** A dyed leather piece cut to the shape of a semi-circle shall be stitched on the inner part of the cuff along the joint of the hand and the cuff portions by a single row of stitches as shown in Fig. 1. The semi-circular piece of leather shall be not less than 75 mm in diameter.
- **5.3.1.8** The gauntlets shall be machine stitched.
- **5.3.1.9** The number of stitches for all the stitchings shall be 6 to 8 stitches per 25 mm.
- **5.3.1.10** All loose ends of stitching threads shall be securely fastened.

5.3.1.11 Workmanship and finish

In appearance, general workman-ship and finish, and in all other respects not defined in this standard, the gauntlets shall conform to the approved sample.

5.3.2 *Type* 2

5.3.2.1 The dimensions of leather gauntlets for workers in iron and steel industry have been shown in Fig. 2 with tolerances as given in **5.1.1**. Other sizes of cuff length, if required, shall be subject to

- agreement between the purchaser and the supplier.
- **5.3.2.2** The inner face of the gauntlets including the inner portion of index, second, third and fourth fingers shall be cut from one piece of leather. The thumb shall be cut from a separate piece of leather.
- **5.3.2.3** The leather components shall be assembled with the flesh side up, the gain side being inside.
- **5.3.2.4** The outer face of the gauntlets including index second, third and fourth fingers shall be cut from one piece of canvas.
- **5.3.2.5** The thumb shall be made with the two cut sides placed together and stitched with one row of stitches. The thumb thus formed shall be attached to palm portion through the cut hole and secured by two rows of stitches as shown in Fig. 2.
- **5.3.2.6** The joint at the palm and the thumb shall be reinforced with the same quality of leather as used for the inner face and stitched by two rows of stitches.
- **5.3.2.7** The back portion made of canvas shall be secured with the corresponding palm piece made of leather by two rows of stitches with the edges of both leather and canvas placed inside.
- **5.3.2.8** A leather strip, 20 mm wide and of the same quality of leather used for the inner face of the gauntlet, shall be used for reinforcing the face of canvas over the knuckles. The reinforcement piece shall be placed side up and secured by four rows of stitches.
- **5.3.2.9** The cuff portion shall be made from one piece of canvas, the side edges being stitched together by double row of stitches with the ends placed inside. The cuff thus formed shall be secured to the hand part by two rows of stitches with the edges of the material placed inside. The bottom edge of the cuff shall be hemmed (6 mm) with the row edges properly turned in.
- **5.3.2.10** The gauntlets shall be machine stitched.
- **5.3.2.11** The number of stitches for all the stitchings shall be 6 to 8 stitches per 25 mm. All loose ends of stitching threads shall be securely fastened.

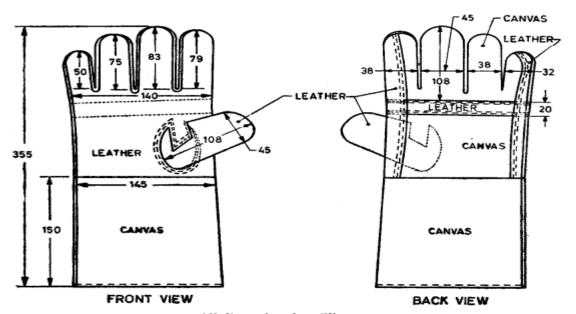
5.3.2.12 Workmanship and finish

In appearance, general workman- ship and finish, and in all other respects not defined in this standard, the gauntlets shall conform to the approved sample.

5.3.3 *Type* 3

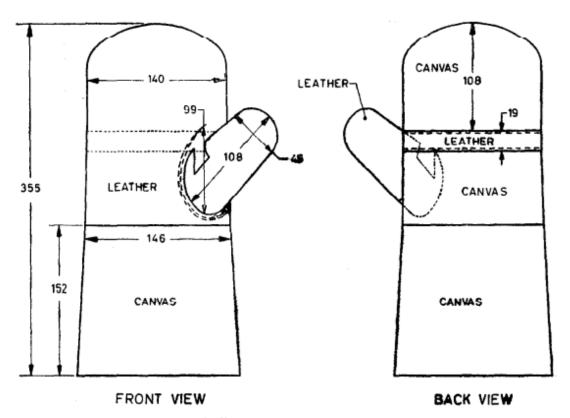
5.3.3.1 The dimensions of mittens have been shown in Fig. 3 with tolerances as given in **5.1.1.** Other sizes of cuff length, if required, shall be subject to agreement between the purchaser and the supplier.

5.3.3.2 The palm including the inner component of the compartment for the four fingers shall be cut from one piece of leather and the thumb from a separate piece.



All dimensions in millimetres.

Fig. 2 Leather Gauntlets for Workers in Iron and Steel Industry



All dimensions in millimetres.

Fig. 3 Leather Mittens for Workers in Iron and Steel Industry

- **5.3.3.3** The leather components shall be assembled with the flesh side out, the grain side being inside.
- **5.3.3.4** The back portion including the outer component of the compartment for the four fingers shall be cut from one piece of canvas.
- **5.3.3.5** The thumb shall be made with the two sides placed inside and stitched with a row of stitches. The thumb thus formed shall be attached to the palm through the cut hole and secured by two rows of stitches.
- **5.3.3.6** The joint at the palm and the thumb shall be reinforced by the same leather material and switched by two rows of stitches as shown in Fig. 3.
- **5.3.3.7** The back portion made of canvas shall be secured with the corresponding palm piece made of leather by two rows of stitches with the edges of both the leather and canvas placed inside.
- **5.3.3.8** The entire palm portion may be lined with canvas of the same quality as used for the back, if required by the purchaser.
- **5.3.3.9** A leather strip, 19 mm wide and of the same quality of leather as used for the inner face of the mittens, shall be used for reinforcing the outer face of the canvas over the knuckles. The reinforcement piece shall be placed flesh side out and secured by four rows of stitches.
- **5.3.3.10** The cuff portion shall be made from one piece of canvas, the side edges being stitched together with two rows of stitches with the ends placed inside.
- **5.3.3.11** The cuff thus formed shall be secured to the hand part by two rows of stitches all along their edges and turned over subsequently. The bottom edges of the cuff shall be hemmed 6.0 mm with the raw edge properly turned in.
- **5.3.3.12** The mittens shall be machine stitched.
- **5.3.3.13** The number of stitches for all stitching shall be 6 to 8 stitches per 25 mm.
- **5.3.3.14** All loose ends of stitching threads shall be securely fastened.

5.3.3.15 Workmanship and finish

In appearance, general workmanship and finish, and in all other respects not defined in this standard, the mittens shall conform to the approved sample.

6 HEAT RESISTANCE TEST

The increase in temperature of the inner surface of gauntlet/mitten, after 5 s of contact of outer surface at 90 $^{\circ}$ C shall not be more than 5 $^{\circ}$ C.

7 MARKING AND PACKING

7.1 Marking

The gauntlets and mittens shall be legibly stamped on the inside of the cuff with the manufacturer's name or recognized trademark, if any, and the year of supply.

7.1.1 The gauntlets and mittens may also be marked with the Standard Mark.

7.1.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

7.2 Packing

The gauntlets and mittens shall be supplied in pairs suitably packed as agreed to between the purchaser and the supplier.

8 SAMPLING

8.1 Sampling of leather gauntlets and mittens shall be carried out as prescribed in Annex B.

8.2 Number of Tests

Each of the gauntlet or mitten pairs selected according to the sampling procedure prescribed in Annex B shall be examined for size (see 4.2), thickness of leather [see 5.2.1(a)], dimensions, workmanship and finish and manufacturing details which do not need the opening up of the gauntlets.

8.3 Criteria for Conformity

Any pair failing to meet one or more requirements mentioned in **8.2**, shall be considered as a defective pair.

8.3.1 If the number of defective pairs found is less than or equal to the corresponding permissible number given in col (3) of Table 4, the lot shall be declared as conforming to the requirements of this standard, otherwise not.

ANNEX A

(Clause 2)

LIST OF REFFERED INDIAN STANDARDS

IS No.	Title	IS No.	Title
IS 582	Methods of chemical testing of leather:		woven fabrics (second revision)
(Part 9) : 2022	Determination of pH and difference figure	IS 1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per unit area of
Part 10	Determination of chromic oxide content,		fabrics (second revision)
Sec 1 : 2022	Quantification by titration	IS 1969	Textiles — Tensile properties of fabrics:
Sec 4 : 2022	Quantification by inductively coupled plasma (ICP)	(Part 1) : 2018	Determination of maximum force and elongation at maximum force using the strip
IS 1640 : 2007	Glossary of terms relating to hides, skins and leather (first		method (fourth revision)
	revision)	(Part 2) : 2018	Determination of maximum force using the grab method
IS 1670 : 1991	Textiles — Yarn — Determination of breaking load		(fourth revision)
	and elongation at break of single strand (second revision)	IS 5914 : 1970	Methods of physical testing of leather
IS 1720 : 1978	Specification for cotton sewing threads (<i>first revision</i>)	IS 15298	Personal protective equipment:
IS 1963 : 1981	Methods for determination of threads per unit length in	(Part 1) : 2015	Test methods for footwear (second revision)

ANNEX B

(Clauses 8.1 and 8.2)

SAMPLING OF LEATHER GAUNTLETS AND MITTENS

B-1 LOT

B-1.1 In any consignment, all the leather gauntlets or mittens, of the same type, size, shape and design and manufactured from the same materials under similar processes of manufacture shall be divided into minimum number of groups of 500 pairs or less. Each such group shall constitute a lot.

B-1.2 For deciding the conformity of the lot to the requirements of the specification, gauntlets or mittens shall be inspected for each lot separately. The number of pair selected for this purpose shall be as given in Table 4.

Table 4 Scale of Sampling and Permissible Number of Defectives

(Clauses 8.3.1 and B-1.2)

Sl No.	Number of Gauntlet or Mitten Pairs in this Lot	Number of Pairs to be Selected	Permissible Number of Defective Pairs
	N	n	
(1)	(2)	(3)	(4)
i)	Up to 15	7	0
ii)	16 to 40	10	1
iii)	41 to 110	15	1
iv)	111 to 300	25	2
v)	301 to 500	35	3

- **B-1.3** The gauntlet or mitten pairs shall be selected at random and in order to ensure randomness of selection, one of the following two procedures is recommended for use:
 - a) If all the pairs are packed together in one box, then starting from any pair count them as 1, 2,up to r^{th} and so on, where r^{th} is the integral part of N/n (N being
- the number of pairs in the lot and n being the number of pairs to be selected). Every rth pair thus counted shall be withdrawn to constitute a sample; and
- b) If the pairs are packed in more than one box, then approximately equal number of pairs shall be selected at random from as many boxes as possible so as to give the requisite number of pair.

IS 2573: 2023

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Leather, Tanning Material and Allied Products Sectional Committee, CHD 17

Organization	Representative(s)
Central Leather Research Institute, Chennai	Dr K. J. Sreeram (<i>Chairperson</i>) Dr R. Mohan (<i>Alternate</i>)
A C Tech Leather and Footwear Alumni Association, Chennai	SHRI N. R. JAGANNATHAN
All India Skins & Hide Tanners and Merchants Association, Chennai	SHRI T. MOHAMMAD MUBEEN SHRI S. MOHAMMED HASSAN (Alternate)
A T C Chemicals India Private Limited, Chennai	SHRI SUBBARAYAN GOVARDHANAN (<i>Alternate</i>)
Central Footwear Training Institute, Chennai	SHRI K. MURALI
Central Pollution Control Board, Delhi	SHRI S. K. GUPTA SHRI R. C. SRIVASTAVA (<i>Alternate</i>)
Council for Footwear and Leather Accessories (CFLA), Gurugram	REPRESENTATIVE
Council of Leather Exports, Chennai	SHRI SANJAY LEEKHA SHRI R. SELVAM (<i>Alternate</i>)
Department of Industrial Policy and Promotion, New Delhi	SHRI SHAISH KUMAR SHRI NAND LAL (<i>Alternate</i>)
Directorate General of Quality Assurance, Kanpur	SHRI S. CHAKRABORTY SHRI T. P. BANERJEE (Alternate)
Indian Finished Leather Manufacturers & Exporters Association, Chennai	SHRI N. SHAFEEQ AHMED SHRI P. K. ASLAM BASHA (<i>Alternate</i>)
Indian Leather Products Association, Kolkata	Ms Arpita Paul
Indian Leather Technologist Association, Southern Chapter	REPRESENTATIVE
Indian Shoe Federation, Chennai	SHRI V. MUTHUKUMARAN SHRI ABDUL RAHMAN
Intertek India Pvt Ltd, Gurugram	Representative
National Institute of Fashion Technology, Chennai	Shri E. Sivasakthi Dr M. Aravendhan (<i>Alternate</i>)

SHRI CHANDAN SAHA

Niti Aayog, New Delhi

Organization Representative(s)

Office of the Development Commissioner, New Delhi DIRECTOR (Leather)

Prara Leathers Private Limited, Ranipet REPRESENTATIVE

SHRI NIAZ AHMED Reagent Leather Services, Chennai

SGS India Private Limited, Gurugram SHRI P. VENKATESAN

SHRI G. MUTHUKUMAR (Alternate)

Stahl India Private Limited, Chennai SHRI NAGARATHNAM

SHRI SURYANARAYANAN (Alternate)

The Concert Trust, Chennai SHRI S. KOMANDUR SRINATH

SHRI M. R. KRISHNAN (Alternate)

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HEAD (CHEMICAL) [REPRESENTING DIRECTOR

GENERAL (*Ex-officio*)]

Member Secretary MS PREETI PRABHA SCIENTIST 'C'/DEPUTY DIRECTOR (CHEMICAL), BIS

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected	

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