भारतीय मानक मसौदा

स्लाइड फास्टनर्स (सामान्य प्रयोजन) — विशिष्टि

(IS 3148 *का पांचवा पुनरीक्षण*)

Draft Indian Standard

Slide Fasteners (General Purpose) — Specification

(Fifth Revision of IS 3148)

ICS 61.040; 83.140.01

Consumer Products and Allied Equipment's Sectional Committee, PGD 14	Last date for receipt of comment is: **31 August 2024**

FOREWORD

(*Formal Clauses will be added later*)

Slide fasteners are fastening devices consisting of two flexible textile tapes with interlocking elements on the edge of each tape and a slider so arranged, that by moving the slider along with those tapes (called as stringer tape) in one direction an opening is formed and by moving it in the opposite direction the opening is closed. The stringer tapes after joining (called as chain) can be fitted with or without end stops.

This standard also covers the requirements for plastic slide fasteners for general purpose, which were earlier covered separately in IS 4829 : 1983 'Plastic slide fasteners (*first revision*)' and method of tests covered in IS 10857 : 1984 'Methods of test for slide fasteners'. However, this standard does not specify the requirements of metallic slide fasteners for aviation purposes; the same are covered under IS 9748 : 2024 (*first revision*).

This standard was first published in 1965 and subsequently revised in 1967, 1978, 1983 and 1991. This fifth revision has been brought out to include the latest developments based on the usage in the field. In this revision, the following modifications have been made:

a) The scope has been stated more clearly and comprehensibly,
b) References have been updated,
c) Typographical mistakes have been corrected in clause 10.5, and
d) Clause on sampling criterion has been revised.

The chain of the fasteners is manufactured with different technology and machinery. Its construction differs depending upon the material used and technology adopted. Chain constructions are classified broadly as given in Annex A.

Examples of a wide range of end uses of slide fasteners are given in Annex A. These are grouped into five performance codes with their designations. The relative position of each end use in the Annex A is based on the currently accepted practices and judgement should be exercised on likely requirements when selecting a fastener for a particular end use by the purchaser and user of the slide fastener.

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.

Draft Indian Standard

SLIDE FASTENERS (GENERAL PURPOSE)

(*Fifth Revision of* IS 3148)

1 SCOPE

1.1 This standard specifies nomenclature materials, size, designations, types, style numbers, performance requirements and tests for slide fasteners for general purpose.

1.2 This standard does not cover the quality and performance requirements of synthetic (plastic) slide fasteners required for industrial garments, defence and occupational clothing/equipment's that are subjected to rough/tough use, long and severe repeated usage conditions and extreme climatic conditions, they are covered separately in IS 14181 (Part 1 to 3).

1.3 Slide fasteners for aviation purposes are not covered in this standard.

2 REFERENCES

The standards listed below 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 standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below.

IS No.	*Title*
IS/ISO 105- X05 : 1994	Textiles — Tests for colour fastness : Part X05 Colour fastness to organic solvents
IS/ISO 105-E02 : 2013	Textiles — Tests for colour fastness : Part E02 Colour fastness to sea water
IS/ISO 105-C10 : 2006	Method for determination of colour fastness of textile materials to washing : Test 4 (*second revision*)
IS/ISO 105-E04 : 2013	Method for determination of colour fastness of textile materials to perspiration (*first revision*)
IS/ISO 105-B02 : 2014	Textiles — Tests for colour fastness: Part B02 Colour fastness to artificial light : Xenon arc fading lamp test
IS 196 : 1966	Atmospheric conditions for testing (revised)
IS 3522 (Part 1) : 1989	Textiles — Estimation of common preservatives: Part 1 (*first revision*)
IS 4905 : 2015/ ISO 24153 : 2009	Random sampling and randomization procedures (*first revision*)

IS 14181 (Part 1) : 2024	Synthetic (Plastic) slide fasteners — Special purpose: Part 1 Specification, selection and ordering guideline of the product (*second revision*)
IS 14181 (Part 2) : 2024	Synthetic (Plastic) slide fasteners — Special purpose: Part 2 Test and measurement methods (*first revision*)
IS 14181 (Part 3) : 2002	Synthetic (Plastic) slide fasteners — Special purpose: Part 3 Test report formats

3 NOMENCLATURE

For the purpose of this standard, the nomenclature for various parts of the fasteners shall be as given in Fig. 1.

4 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply:

4.1 Tape

A narrow textile fabric to which interlocking elements are fitted.

4.2 Elements

Rows of metal or plastic (moulded or filament) teeth (scoops), shaped in such a way that when fixed to the edge of tape, they engage or separate from each other under the action of the slider. Elements made of filament are also called formed coil.

4.3 Stringer Tape

This textile tape with an attached row of elements, mounted on one edge of the tape and designed to interlock a row similarly attached to another textile tape.

4.4 Chain (Zip Tape)

This is also referred to as ‘Zip tape’. Zip Tape is continuous closure formed by interlocking two compatible stringers.

4.5 Slider

A movable part consisting essentially of a slider body and normally a puller which opens or closes the fastener by separating or engaging the stringer tapes. The slider may incorporate a locking mechanism, if required by the purchaser.

4.6 Puller (or Pull Tab)

The fitting attached to the slider to facilitate manipulation.

4.7 Locking Device

A device incorporated in the slider unit restricting its free movement along the fastener length in the direction of opening. The locking device may operate either automatically on release of the puller or by manual pressure on the puller.

4.8 Stoppers (Top and bottom)

The stoppers are the end parts of the slide fasteners which restrict the movement of the slider on the chain. The stop(s) at the top-end of the chain that check(s) the extreme closing movement of the slider is called top stop. The stop at the bottom end of the chain that checks the extreme opening movement of the slider is called bottom stop (*see* Fig. 1).

4.9 Closed-End Fastener

A slide fastener which does not permit the complete separation of the two stringers. Normally the top-end of the fastener separates as the slider is lowered, although there is an additional type where the top-ends are permanently joined together by means of a bridge stop (*see* Fig. 2).

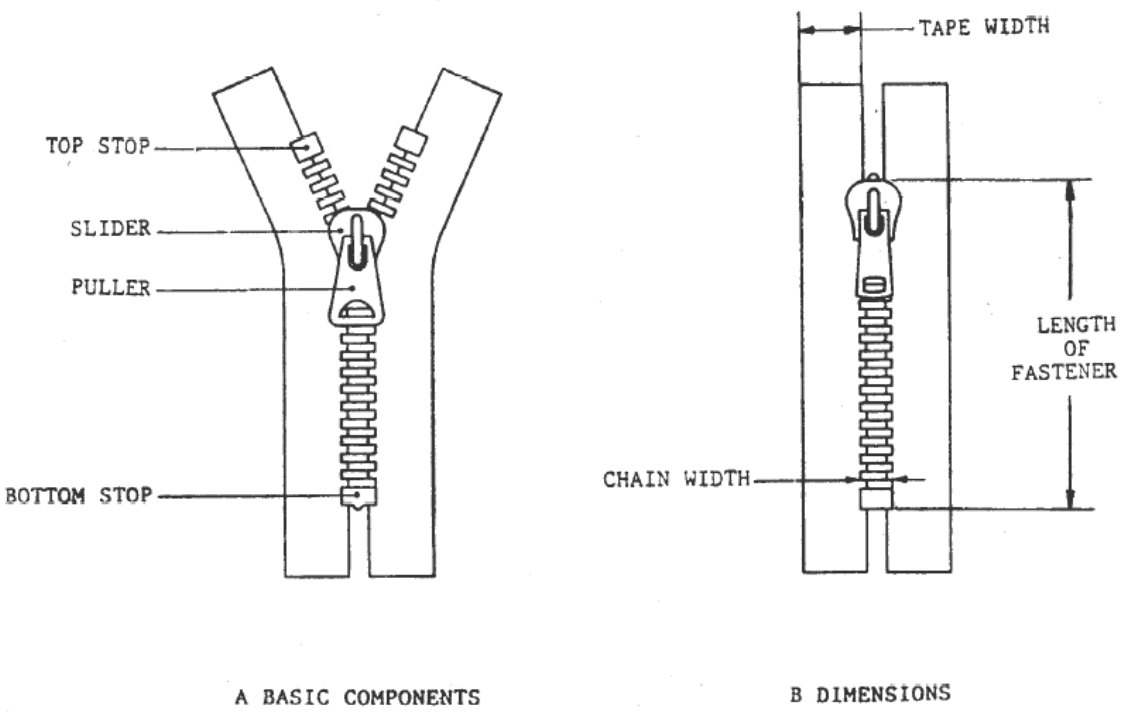


FIG. 1 SLIDE FASTENERS, BASIC COMPONENTS AND DIMENSIONS

(FOR CONVENIENCE ONLY, METALLIC FASTENERS ARE ILLUSTRATED.)

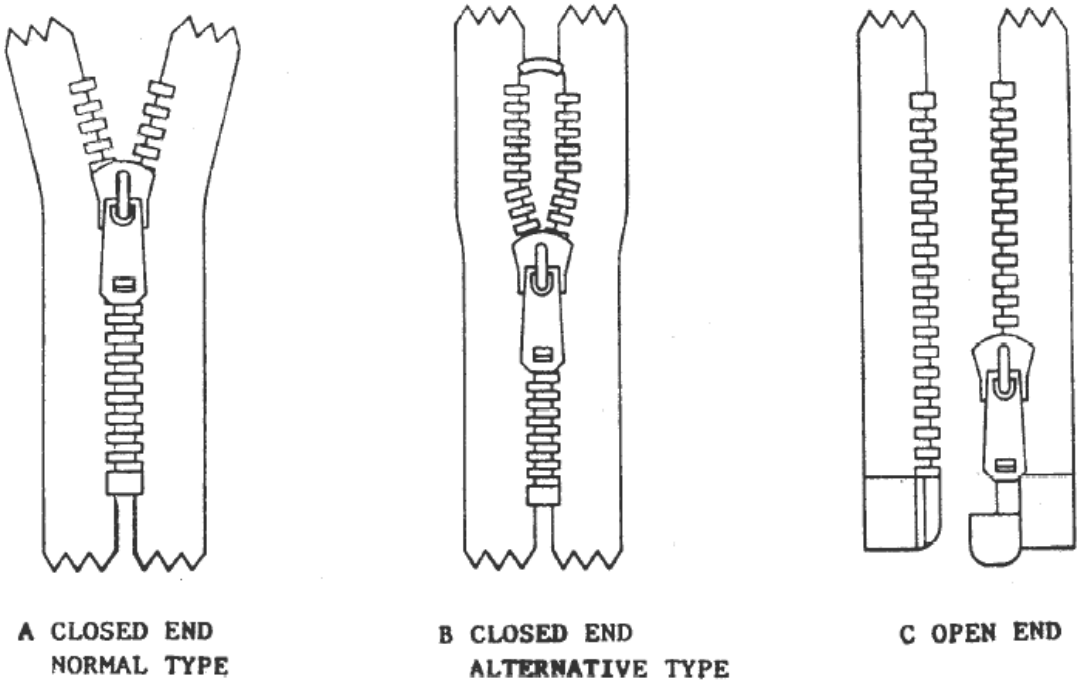


FIG. 2 ONE-WAY FASTENERS

4.10 Concealed Fastener

A slide fastener with the tapes folded so that on closure neither the slider body nor the fastener are visible from the outside of the article.

4.11 Open-End Fastener

A slide fastener having a special fitment at the bottom end of each stringers to be completely separated and re-assembled at will when the slider is in the fully open position. The special fitment normally consists of a pin permanently fixed to the bottom end of one stringer which fits into a box permanently fixed to the bottom end of the other stringer.

4.12 Two-Way Fastener

A slide fastener fitted with two sliders which operate with equal facility in either direction. This type is available in a variety of forms are illustrated in Fig.3.

4.13 Reversible Fastener

A slide fastener capable of being operated from either side. It shall either have pullers on each side of the slider or a single puller that can be moved to both sides of the slider.

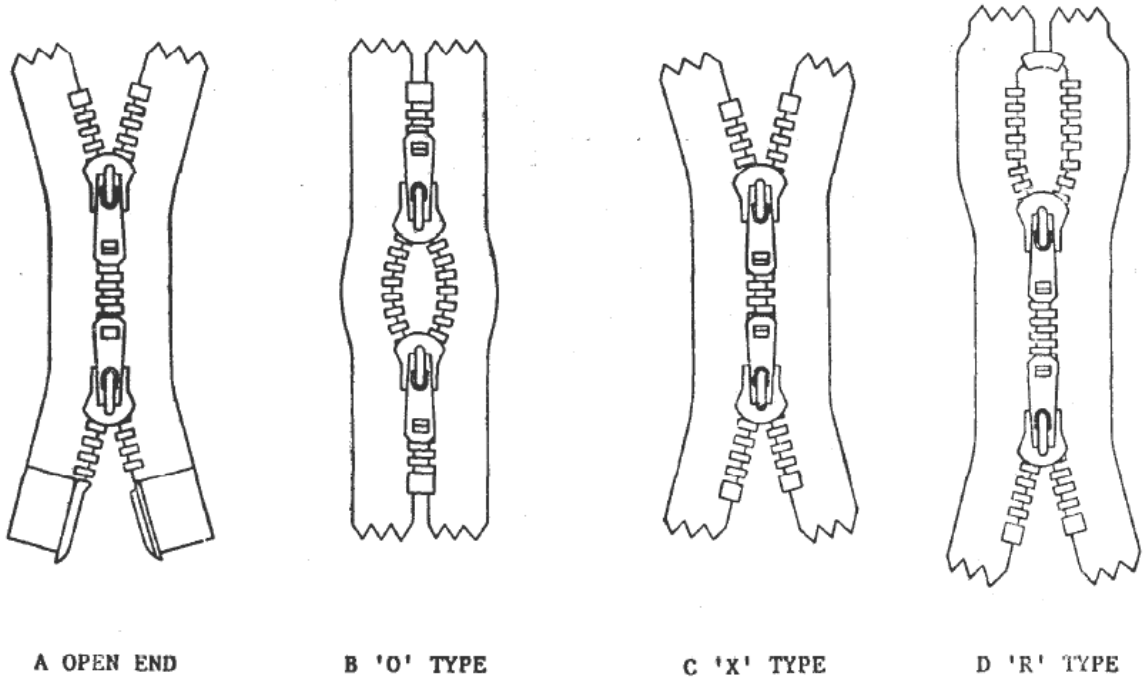


FIG. 3 TWO-WAY FASTENERS

5 SIZE DESIGNATIONS

The slide fasteners shall be of the following 5 size designations according to the chain width (*see* **7.3**):

a) Ultra-light,
b) Light,
c) Medium,
d) Medium heavy, and
e) Heavy

6 MATERIALS

6.1 Tape

It shall be a woven or knitted narrow fabric. Yarn used for the tape making may be cotton, polyester, nylon or any other yarn made from natural blended fibers or man-made fibers. The tape may be made with one or more than one types of yarn.

6.2 Chain

The elements of the chain may be of metal or non-metal. If of metal, the elements may be made from alloys of aluminum, copper, nickel, zinc or from corrosion resistance steel. If of non-metal, the elements may be made from nylon, polyester, polyacetal or any other synthetic material.

6.3 Slider

Sliders shall be fabricated from metal such as an alloy of copper, nickel, zinc or aluminum and steel. When corrosive steel is used, sliders shall be electroplated for rust proofness. If specified by the purchaser, sliders may be enamel painted to matching shade. Such finish is required on the visible surfaces of the slider only.

6.4 Stopper

The stopper shall be fabricated from metals as described for chain or shall be of plastic. If specified by the purchaser, they may be plated or enameled to matching shade/color of the tape.

7 DIMENSIONS

7.1 Tape Width and Extension

Unless otherwise agreed to between the purchaser and the supplier, the minimum tape width and the minimum tape extension shall be as given in the table below. For measuring tape width and tape extension (*see* Fig. 1).

Size Designation	*Tape Width, mm*	*Tape Extension, mm*
Ultra-Light	13	10
Light	13	12
Medium	16	14
Medium Heavy	18	16
Heavy	20	18

7.2 Pull Tab Length

For specific end use of zip fasteners, the pull tab length of the slider may be specified by the purchaser while ordering slide fasteners or sliders. Typical puller lengths in common use are as follows:

	Length, mm
Short	10 to 15
Regular	15 to 22
Medium	22 to 30
Long	30

7.3 Chain Width

The chain widths for different sizes of fasteners shall be as follows:

Size Designation	*Chain Width, mm*
Ultra-Light	Over 2.5 but not more than 3.5
Light	Over 3.5 but not more than 4.5
Medium	Over 4.5 but not more than 6.5

Medium Heavy	Over 5.5 but not more than 9.0
Heavy	Above 7.5

NOTE — A positive tolerance of 5 percent is permitted on the upper limits.

8 FINISH

8.1 For the fasteners which are exposed to corrosive, influences such as sea-water, strong acids and alkalis or to fire hazards, etc. protective finish may be applied on tapes or chains if required by the purchaser. Owing to the many different applications of the various types of fasteners and the widely differing colour fastness characteristics required, any special colour fastness of tape or components shall be negotiated between the purchaser and the manufacturer.

8.2 If cotton is used in tape, it may be given when specified a rot proofing treatment by the purchaser with zinc naphthenate such that the tape shall contain not less than 0.8 percent and not more than 1.2 percent of zinc when tested by the method described in **12** of IS 3522 (Part 1).

8.3 The dyeing of tapes shall be such that they will not deteriorate as a result of acid tendering during storage or use. The loss of breaking force of slide fastener or chain shall not exceed 10 percent after a storage time of 1 year.

9 FASTENER TYPES AND STYLE NUMBER

The slide fasteners of different size designations shall be further designated according to their types and style numbers. Each type of fastener shall be designated with an alphabet Y, P, H, K, O, X or R (*see* Tables 1 and 2) according to its construction. Some typical types are given in Fig. 2 and 3 for illustration. Under each type there shall be different style numbers as given in Tables 1 and 2. All styles are not available in all the designations/sizes of fasteners. While ordering the slide fasteners, the purchaser shall specify types and style numbers as given in these tables.

Table 1 Types and Style Numbers of One-way Fasteners
(*Clause* 9)

Sl No.	Type (Ref Fig. 2)	Style No.	Lock	Top Stop	Bottom Stop
(1)	(2)	(3)	(4)	(5)	(6)
a) Non-Reversible					
i)	Y	Y1 Y2 Y3 Y4	Without Flange/wing Pin/cam autolock	Open	Closed
ii)	P	P1 P2 P3 P4	Without Flange/wing Pin/cam autolock	Bridge	Closed
iii)	H	H1 H2 H3 H4	Without Flange/wing Pin/cam autolock	Open	Separating Unit
b) Reversible					
iv)	YR	YR1 YR2	Without Flange/wing	Open	Closed
v)	PR	PR1 PR2	Without Flange/wing	Bridge	Closed
vii)	HR	HR1 HR2	Without Flange/wing	Open	Separating Unit

Note — The second letter ‘R’ in type designations denotes that the fastener is reversible.

Table 2 Types and Style Numbers of Two-way Fasteners
(*Clause* 9)

Sl No.	Type (Ref Fig. 3)	Style No.	Lock	Top Stop	Bottom Stop	Slider Arrangement
(1)	(2)	(3)	(4)	(5)	(6)	(7)
a) Non-Reversible						
i)	K Fig. 3 (A)	K1 K2 K3 K4	Without flange/wing pin/cam autolock	Open	Separating unit (special slider)	Two sliders mouth to mouth
ii)	O Fig. 3 (B)	O1 O2 O3 O4	Without flange/wing pin/cam autolock	Closed	Closed	Two sliders throat to throat
iii)	X Fig. 3 (C)	X1 X2 X3 X4	Without flange/wing pin/cam autolock	Open	Open	Two sliders mouth to mouth
iv)	R Fig. 3 (D)	R1 R2 R3 R4	Without flange/wing pin/cam autolock	Bridge (closed)	Open	Two sliders mouth to mouth
b) Reversible						
(v)	KR	KR1 KR2	Without Flange/wing	Open	Separating unit (special slider)	Two sliders
(vi)	OR	OR1 OR2	Without Flange/wing	Closed	Closed	Two sliders throat to throat
(vii)	XR	XR1 XR2	Without Flange/wing	Open	Open	Two sliders mouth to mouth
(viii)	RR	RR1 RR2	Without Flange/wing	Bridge (closed)	Open	Two sliders mouth to mouth

NOTE — The second letter 'R' in the type designations denotes that the fastener is reversible.

10 PERFORMANCE REQUIREMENTS

The test specimen shall be brought to standard atmospheric conditions in accordance with the requirements of IS 196. The fastener shall comply with the requirements stated below:

a) Length measurement,
b) Colour fastness,
c) Resistance of chain to lateral load (all types),
d) Reciprocating movement of the slider under load on chain,
e) Security of attachment of top stop (all types),

f) Security of attachment of bottom stop for closed end fasteners,
g) Resistance of open end attachments to lateral load for open end fasteners,
h) Security of attachment of retainer fitted to open end fastener,
j) Security of attachment of the puller to the slider (all types), and
k) Slider lock holding strength.

10.1 Length Measurement

The distance from the top of the slider to the bottom of the bottom stop or retainer (in case of open-end fasteners) shall be measured with the slider in the top position and with puller in the downward position (*see* Fig. 1B).

10.1.1 The length shall be subject to tolerance of ±5 mm for ultralight and light, and ±8 mm for medium and medium heavy size designations for the first 200 mm length, and 2 percent for subsequent length. For chains supplied in continuous roll form, the length variation may be ±2 percent.

10.2 Colour Fastness

In procuring slide fasteners or chains for a specific use, consideration shall be given to specific use, consideration shall be given to specify only those colour fastness requirements as required of the end item to which the slide fasteners shall be fixed.

Typical Examples are:

End Item	*Colour Fastness Requirement*
Wool clothing which is dry cleaned	Good fastness to wet dry clean and light
Wool clothing which is laundered	Good fastness to laundering, chlorine bleaching and light
Tentago and equipage	Good fastness to weathering

10.3 Unless otherwise specified by the purchaser, the slide fastener shall have colour fastness ratings as given below:

Property	*Method of Test*	*Rating*
Colour fastness to:		
Light	IS/ISO 105-B02	
Perspiration	IS/ISO 105-E04	
Sea water	IS/ISO 105-E02	3 or better
Washing	IS/ISO 105-C10	
Organic solvents (dry cleaning)	IS/ISO 105-X05	

10.4 Resistance of Chain to Lateral Load

The functioning of the fastener shall be unimpaired after being subjected to the load specified below in the manner described in Annex B:

Size Designation	*Load, N (kgf, approx)*
Ultra-Light	150 (15)
Light	200 (20)
Medium	250 (30)
Medium Heavy	370 (40)
Heavy	470 (50)

10.5 Reciprocating Movement of Slider

The functioning of the fastener shall be unimpaired after completing 1 000 cycles as described in Annex C. The lateral and longitudinal loads are specified below:

Size Designation	*Load, N (kgf, approx.)*	
	Lateral	Longitudinal
Ultra-Light	7 (0.7)	5 (0.5)
Light	16 (1.0)	9 (0.9)
Medium	20 (1.6)	14 (1.4)
Medium Heavy	24 (2.4)	18 (1.8)
Heavy	30 (3.0)	23 (2.3)

10.5.1 If the fastener is less than 200 mm long, the test shall be carried out on either a suitably lengthened fastener or on a similar type, but of length greater than 200 mm.

10.6 Security of Attachment of Top and Bottom Stops

The functioning of the fastener shall be unimpaired after being subjected to the loads given below in the manner described in Annex D:

Size Designation	*Load, N (kgf, approx.)*	
	Top Stoop	Bottom Stop
Ultra-Light	50 (5)	35 (3.5)
Light	70 (7)	60 (6)
Medium	90 (9)	80 (8)
Medium Heavy	110 (11)	100 (10)
Heavy	130 (13)	140 (14)

10.7 Resistance of Retainer to Lateral Load for Open End Fasteners

The fastener shall be subjected to the load specified below, in the manner described in Annex E after which it shall be unimpaired and two halves shall be capable of being readily and successively separated or reassembled in accordance with the manufacturer's instruction:

Size Designation	*Load, N (kgf, approx.)*
Ultra-Light	40 (4)
Light	70 (7)
Medium	90 (9)
Medium Heavy	120 (12)
Heavy	160 (16)

10.8 Security of Attachment of Retainer to Longitudinal Load for Open End Fastener

The fastener shall be subjected to the load specified below in the manner described in Annex F after which it shall be unimpaired and the two halves shall be capable of being readily and successively separated and reassembled in accordance with manufacturer's instructions:

Size Designation	*Load, N (kgf, approx.)*
Ultra-Light	40 (4)
Light	70 (7)
Medium	90 (9)
Medium Heavy	120 (12)
Heavy	150 (15)

10.9 Security of Attachment of Puller

The functioning of the slider shall be unimpaired after being subjected to the load given below in the manner described in Annex G:

Size Designation	*Load, N (kgf, approx.)*
Ultra-Light	60 (6)
Light	70 (7)
Medium	140 (14)
Medium Heavy	200 (20)
Heavy	250 (25)

10.10 Slider Lock Holding Strength

The chain and locking device shall be unimpaired after the application of the load specified below in the manner described in Annex H:

Size Designation	*Load, N (kgf, approx.)*
Ultra-Light	15 (1.5)
Light	20 (2)
Medium	40 (4)
Medium Heavy	50 (5)
Heavy	60 (6)

11 Ordering Information

The purchase shall select the preferred options permitted in the standard and include the following information while ordering slide fasteners.

a) Designation No. and title of this Indian Standard;

b) Chain construction,

c) Size designation,

d) Fastener type and style number,

e) Length of the fastener or continuous chain roll,

f) In respect of tape and chain,

1) Material and construction,

2) Colour (shade number required),

3) Colour fastness required,

4) Any protective coating required, and

5) Special tape width and tape extension, if required.

g) In respect to the slider pull tap – length and finish, and

h) Any other special features or deviations.

12 SAMPLING

Sampling and acceptance criteria for metallic slide fasteners shall be as agreed to between the purchaser and the supplier. A recommended scheme for the same is given in Annex J.

13 MARKING

13.1 The following information shall be indicated on the package:

a) Indication of source of manufacture, initials or trade-mark, if any,
b) Details of chain construction, size, designation, type and style number,
c) Colour and shade,
d) Length of each fastener or continuous chain roll,
e) Number of pieces in the pack, and
f) Month and year of manufacture.

13.2 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.

ANNEX A
(*Foreword*)

CHAIN CONSTRUCTIONS, END USES AND PERFORMANCE CODES

A-1 CHAIN CONSTRUCTIONS

Typical chain constructions are shown in Fig. 4.

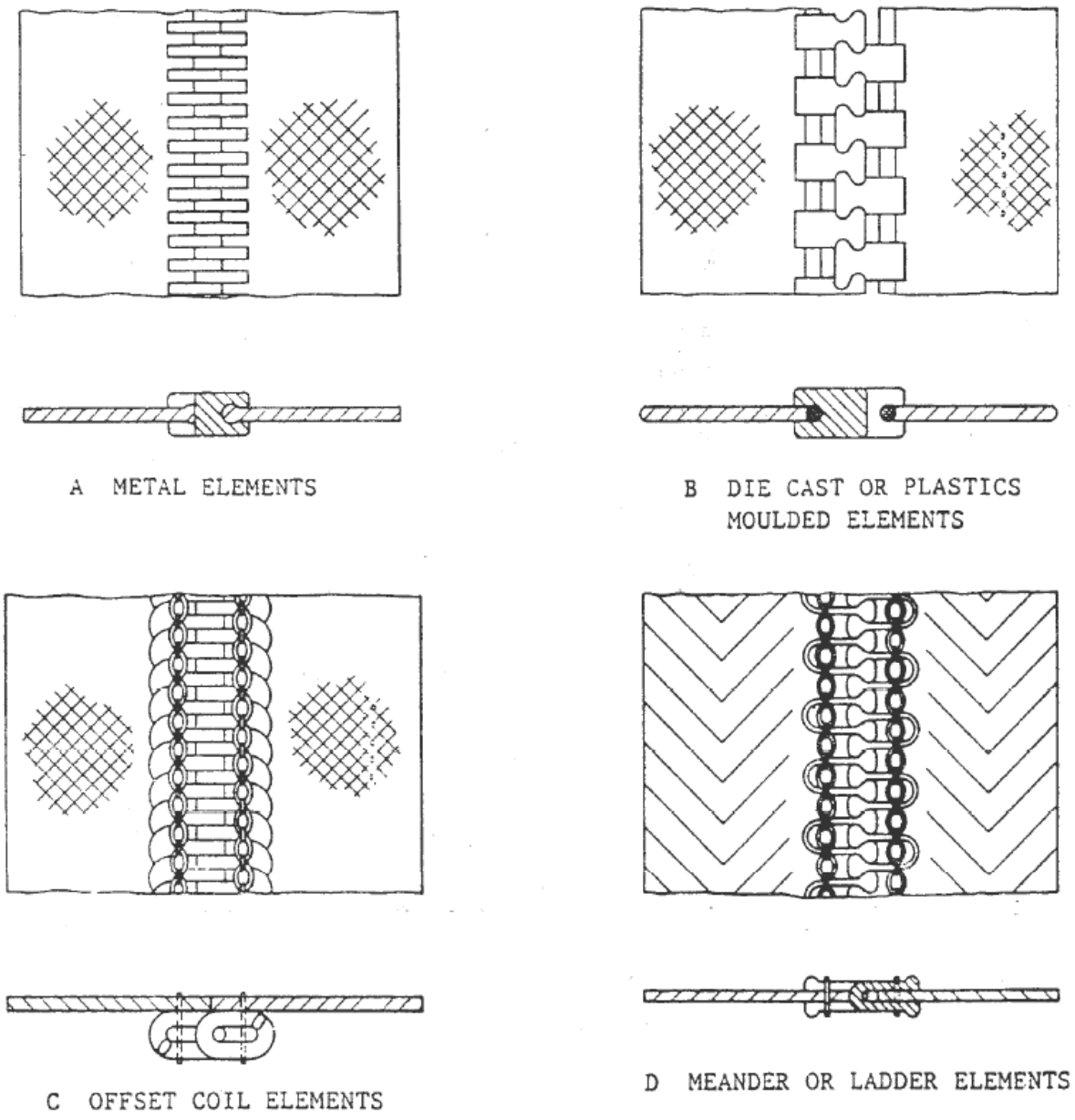


FIG. 4 FASTENER CHAIN CONSTRUCTIONS

A-2 SELECTION OF SLIDE FASTENERS FOR END USES:

General purpose slide fasteners are used for mass consumption items where aesthetic and colour matching are very important for fashion garments. The life cycle of these fasteners is not very high. Also, the cost of fastener has to be competitive to make end use item affordable for masses. Table 5 gives recommendation with regard to selection of designation of slide fasteners (General purpose). End usage or application requiring slide fastener to stand heavy stress and strains due to rough and touch usage (like industrial cloths or for military garments and equipment), as well as requiring higher life cycle, it is recommended that they use special purpose synthetic slide fastener as per IS 14181 (Parts 1 to 3).

Table 5 Selection of Slide Fasteners for End Uses

(Clause A-2*)*

Sl No.	**End Uses**	**Ultra-Light**	**Light**	**Medium**	**Medium Heavy**	**Heavy**
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Light fabric dresses		×	×		
ii)	Knitwear	×	×	×		
iii)	Light Leather goods		×			
iv)	Skirts, jeans or trousers		×	×		
v)	Upholstery		×	×	×	
vi)	Foundation garments	×	×			
vii)	Coats and jackets			×	×	×
viii)	Overalls			×	×	
ix)	Luggage			×	×	×
x)	Sleeping bags			×	×	×
xi)	Lightweight and inner tents			×	×	×
xii)	Footwear			×	×	×
xiii)	Leather garments			×	×	×
xiv)	Ski clothes			×	×	
xv)	Wet suits			×	×	×

ANNEX B
(*Clause* 10.4)

METHOD OF TESTING RESISTANCE OF CHAIN TO LATERAL LOAD

B-l OUTLINE
The test specimen is subjected to lateral load under controlled conditions while the fastener chain is in the closed position.

B-2 APPARATUS

B-2.1 The testing machine shall be of constant rate of traverse type and the speed of the opening of the jaws shall be 102 ± 13 mm per minute. The load range shall be such that the breaking load of the test specimen falls between 15 and 85 percent of the maximum reading on the scale.

NOTE — It is recommended that the load scale be calibrated at least once every 12 months by adding dead weights successively. Since calibration of these machines is normally carried out with maximum reading device inoperative, the use of a maximum reading device at low loads may introduce serious errors.

B-2.2 The gripping jaws or other securing devices/shall have a gripping surface 25mm wide. The jaws shall be so constructed and finished so that they neither damage the tape nor allow the specimen under test to slip (*see* Fig. 5).

B-3 PROCEDURE

The test specimen is secured in place with the gripping devices so arranged that at least half the width of each tape is gripped and there is at least 25 mm of closed chain on either side. The machine is then set in operation until the specified loading is reached, or the specimen fails.

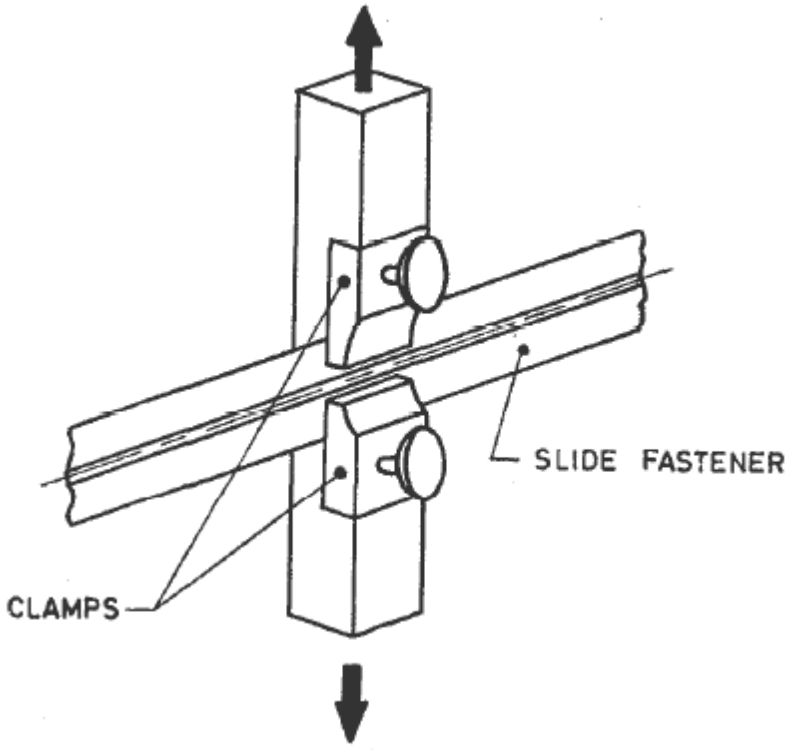


FIG. 5 LATERAL LOAD FOR CHAIN

ANNEX C
(*Clause* 10.5)

METHOD OF TEST FOR RECIPROCATING MOVEMENT OF SLIDER

C-1 APPARATUS

A testing machine which operates in horizontal or vertical plane, constructed in such a way as to provide the following facilities:

a) A fixed clamp to grip one end of the fastener as shown in Fig. 6.
b) Means of opening and closing the fastener continuously in a definite manner. The slider shall have arrangement for reciprocating movement of 30 cycles per minute and length of traverse of the slider shall be between 75 to 90 mm.
c) Means of gripping the tape securely by two clamps placed in between the length of the fastener at opposite points so that the clamps may be subjected to transverse load by means of spring balance or weights as shown in Fig. 6.
d) Means of separately gripping the two halves of the fastener at the other end so that the fastener beyond the slider is open. The gripping device shall swing through the spring balances or through the pulleys and weights. The distance between the gripping device is such that when the slider is at the lowest point in the cycle, the two ends of the fastener subtend an angle of approximately 60°.
e) Means of gripping the tape securely by 3 or 4 clamps equally spaced along the length at opposite points of the testing zones. So that the clamps may be subjected to transverse load by means of spring balance or weights.

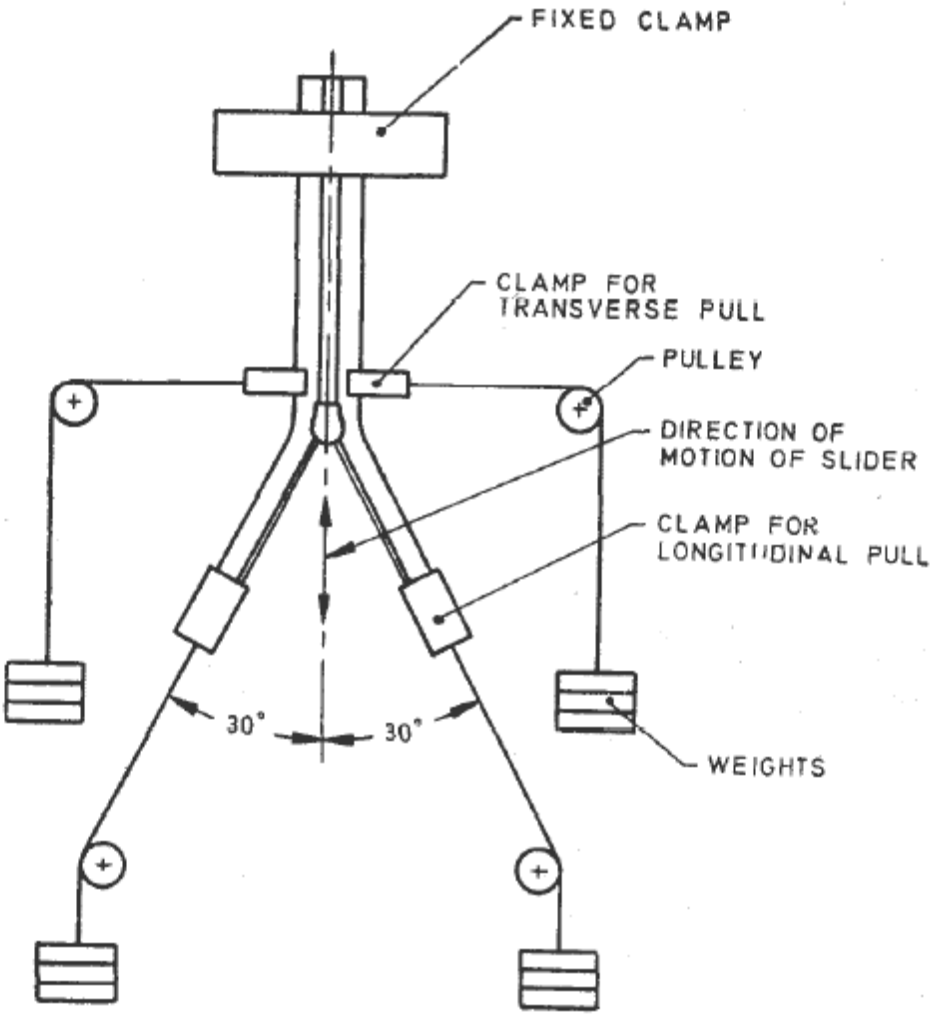


FIG. 6 RECIPROCATING MOVEMENT TEST FOR SLIDER

C-2 PRODEDURE

C-2.1 The fastener is fixed in the machine symmetrically about the direction of motion of the slider as shown in Fig. 6.

C-2.2 The slider is adjusted to move between 75 to 90 mm length of the fastener.

C-2.3 The appropriate lateral and longitudinal loads as specified in **10.4** are applied.

C-2.4 The machine is put in motion for one cycle only to equalize the position of fastener.

C-2.5 The machine is then set in motion at constant speed.

C-2.6 The machine is left in operation until the 1000 cycles are completed, unless the specimen fails earlier.

ANNEX D
(*Clause* 10.6)

METHOD OF TEST FOR SECURITY OF ATTACHMENT OF TOP AND BOTTOM STOPS

D-1 OUTLINE

Each stop is subjected to tension while the fastener is secured in position, load being applied through the medium or the puller in such a way as to bring the stop under pressure from the slider.

D-2 APPARATUS

A testing machine as described in Annex B is used. Diagrammatic sketch of the arrangement are given in Fig. 7 and Fig. 8.

D-3 PROCEDURE

D-3.1 Top Stop Test (All Types of Fasteners)

The test specimen is in the closed position with the slider adjacent to the top stop. The puller is secured in one jaw of the machine and the other end of the specimen in the other jaw, steps being taken to avoid damaging the chain. The machine is then set ill operation until the specified loading is reached, unless the specimen fails earlier.

D-3.2 Bottom Stop Test (Closed End Fasteners)

The test specimen is in the open position, the slider being adjacent to the bottom stop. The angle between the stringers is the natural angle of opening, which is usually between 40° and 60°. The proceed is as described in **B-3**.

NOTE — A stringer is a row of scoops fitted on a textile tape.

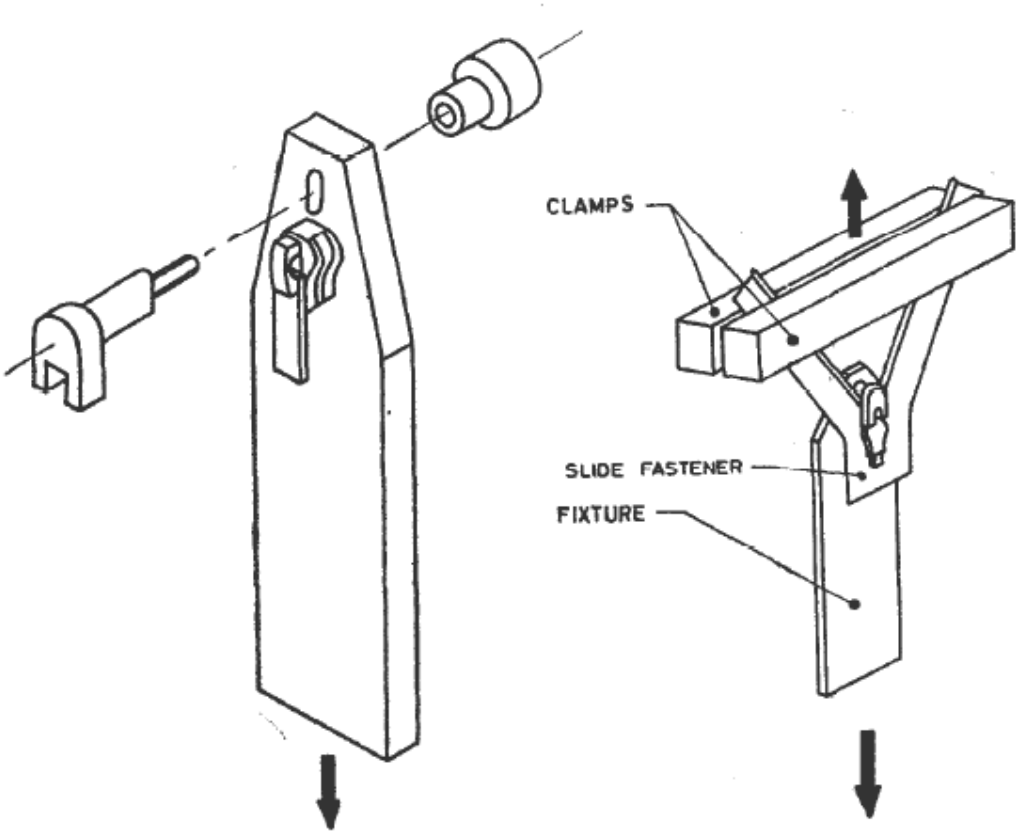


FIG. 7 SECURITY OF ATTACHMENT TEST FOR BOTTOM STOPS

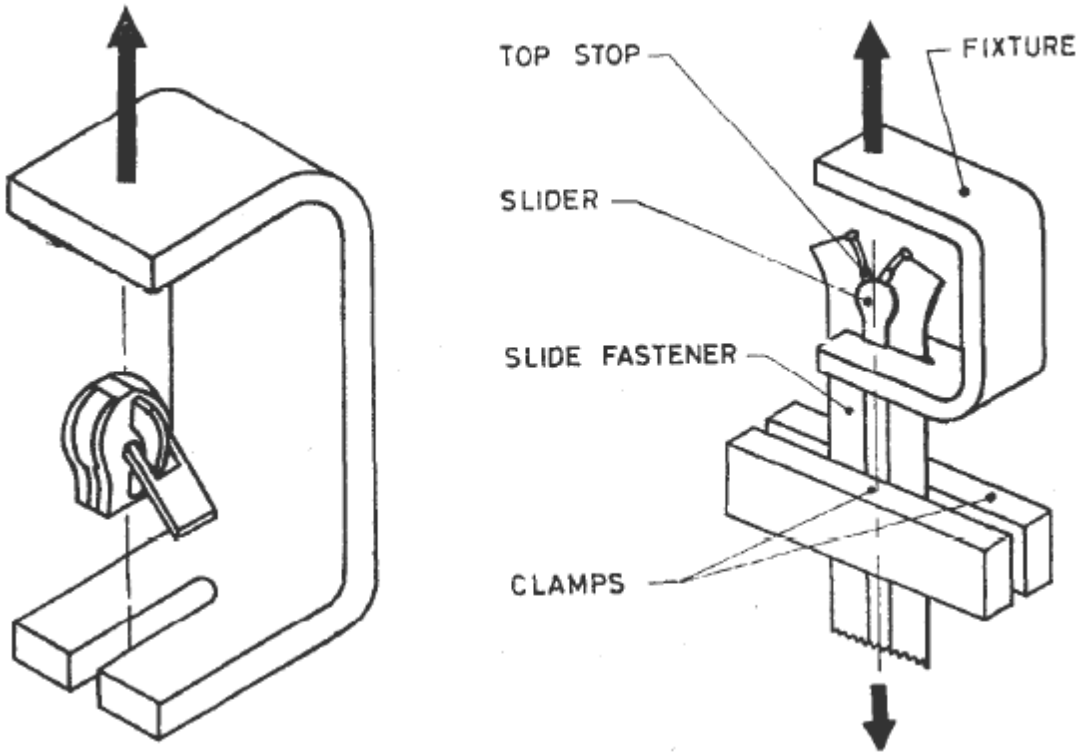


FIG. 8 SECURITY OF ATTACHMENT TEST FOR TOP STOPS

ANNEX E
(*Clause* 10.7)

METHODS OF TESTING RESISTANCE OF RETAINER TO LATERAL LOAD FOR OPEN END FASTENERS

E-1 OUTLINE

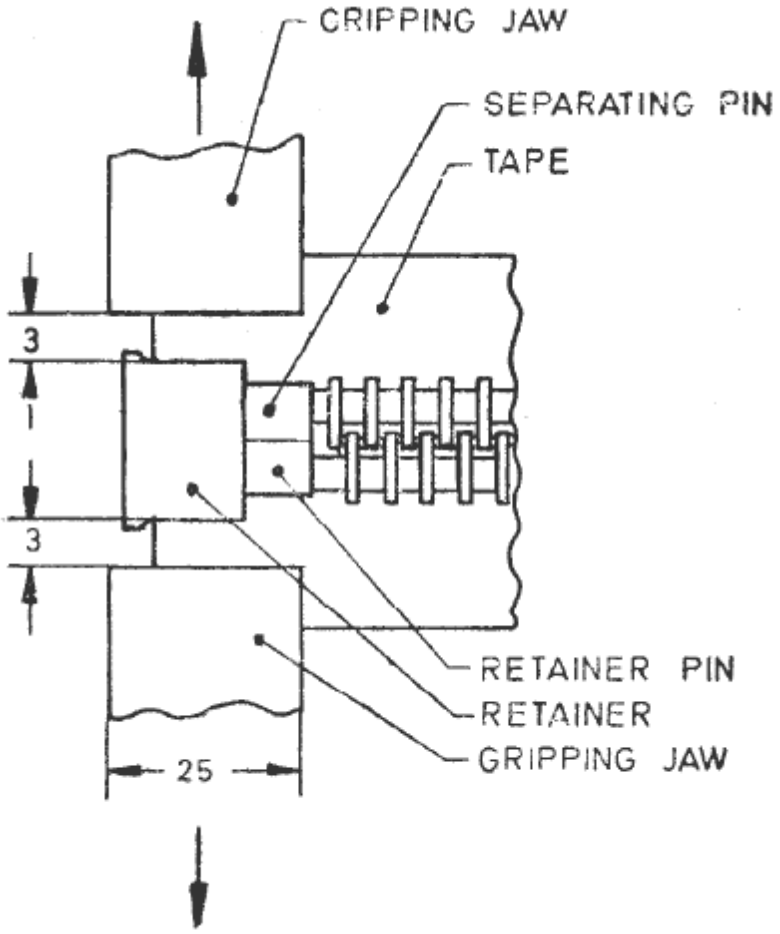
The test specimen is subjected to lateral loading under controlled conditions while the fastener chain is in the closed position.

E-2 APPARATUS

A testing machine as described in **B-2.1** is used. The gripping jaws shall be 25 mm wide and would be so constructed and finished as not to damage the tape while tightening and not to allow the specimen under test to slip (*see* Fig. 9).

E-3 PROCEDURE

The test specimen shall be secured in the gripping jaws of the testing machine with the edges of the jaws parallel to and 3 mm from the sides of the retainer. The jaws will be arranged so that the separating pin aligns with the edges of the jaws. The machine is set in operation until the specified loading is reached, unless the specimen fails earlier.



All dimensions in millimetres.

FIG. 9 LATERAL LOAD TEST FOR RETAINER OPEN END FASTENER

ANNEX F
(*Clause* 10.8)

METHOD OF TESTING SECURITY OF ATTACHMENT OF RETAINER TO LONGITUDINAL LOAD FOR OPEN END FASTENERS

F-1 OUTLINE

The retainer is subjected to longitudinal load while the fastener chain is in the closed position.

F-2 APPARATUS

A testing machine as described in **B-2.1** is used. Fig. 10 gives diagrammatic sketch of the arrangement.

F-3 PROCEDURE

With the test specimen in the closed position, the interlocked chain is clamped into one jaw of the testing machine, steps being taken to avoid damaging the chain. A slotted plate, shaped to clear the tape, chain and pin and to bear against the whole of the top edges of the retainer is clamped into the other jaw. The machine is set in operation until the specified loading is reached, unless the specimen fails earlier.

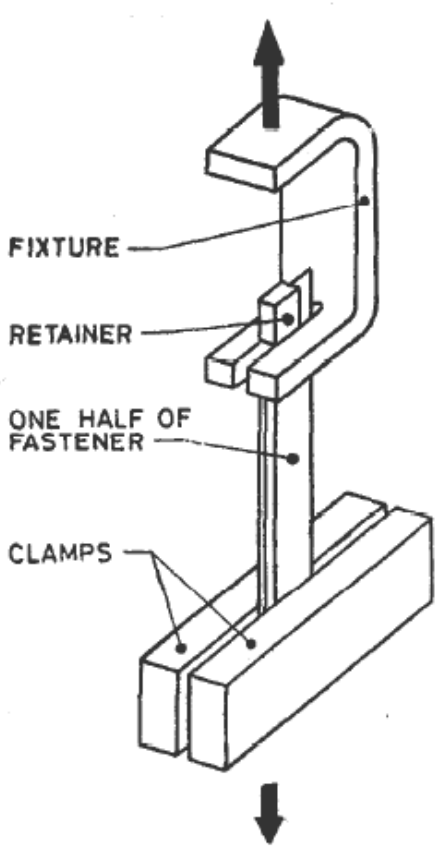


FIG. 10 LONGITUDINAL LOAD TEST FOR RETAINING OPEN END FASTENER

ANNEX G
(*Clause* 10.9)

METHOD OF TESTING SECURITY OF ATTACHMENT OF PULLER

G-1 OUTLINE

The puller is subjected to tension while the slider is rigidly supported.

G-2 APPARATUS

G-2.1 A testing machine as described in **B-2.1** is used

G-2.2 A masking device for the slider, such as a face-plate is required so that tension is confined to the puller attachment to the slider (*see* Fig. 11).

G-3 PROCEDURE

The specimen is mounted in one grinding device of the testing machine with the puller passed through a hole in the mask. The mask is so arranged at the slider and the Chain are rigidly clamped in place, only the puller being free. The end of the puller then secured to the other gripping device so that tension is applied at 90° to the face of the slider. The testing machine is then set in operation until specified loading is reached, unless the specimen fails earlier.

ANNEX H
(*Clause* 10.10)

METHOD OF TEST FOR SLIDER LOCK HOLDING STRENGTH

H-1 OUTLINE

The slider is locked on the chain and the locking device subjected to tension, load being applied at 180° to the device, via the chain stringers in such a way ag to bring the locking device under pressure from the chain.

H-2 APPARATUS

A testing machine as described in **B-2.1** is used. Fig. 12 gives a diagrammatic sketch of the arrangement.

H-3 PROCEDURE

The test specimen is in the open position with the locking device locked into the chain 25 mm from the top stops. The jaws are set 50 mm apart and the top of the stringer secured into the jaws adjacent to the top so that the top of the slider is 25 mm from the edge of each jaw. The machine is set in motion and the load increased until the locking mechanism slips or the specimen fails.

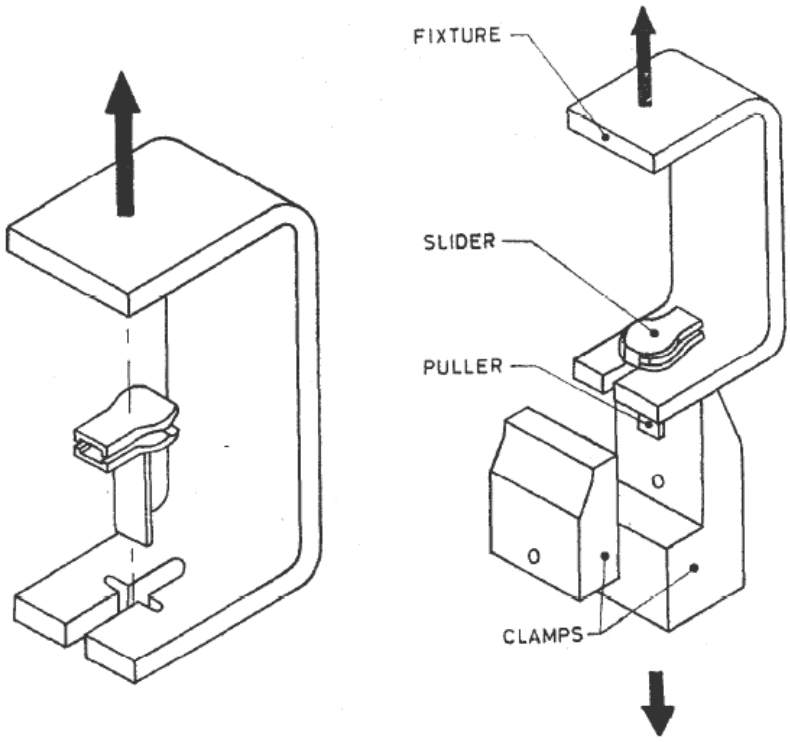


FIG. 11 SECURITY OF ATTACHMENT TEST FOR PULLER

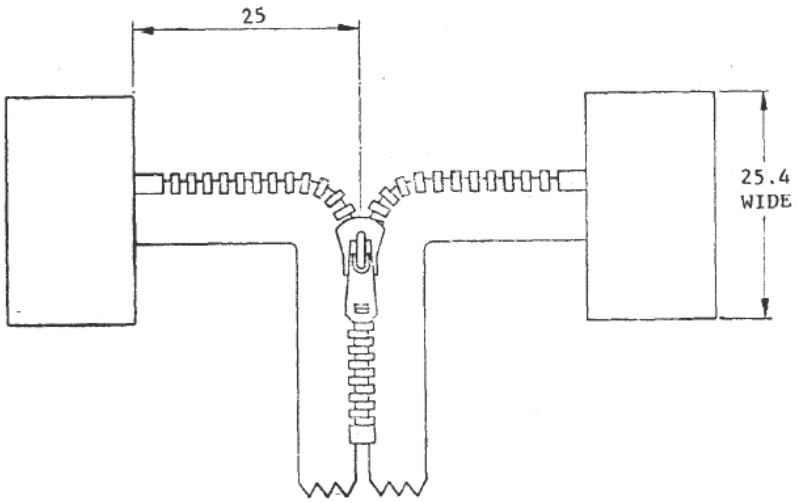


FIG. 12 STRENGTH TEST FOR SLIDER LOCK

ANNEX J

(*Clause* 12)

SAMPLING SCHEME AND CRITERIA FOR CONFORMITY

J-1 LOT

All the slide fasteners of the same designation and manufactured from the same raw materials, under essentially similar condition of manufacture, shall constitute a lot.

J-2 SCALE OF SAMPLING

J-2.1 The conformity of a lot to the requirements of this standard shall be determined on the basis of tests carried out on the samples selected from the lot.

J-2.2 The number of slide fasteners to be selected from a lot for testing shall depend upon the size of the lot (*see* Tables 3 and 4) and shall be selected at random from the lot. To ensure the randomness of selection, procedures given in IS 4905 may be followed.

Table 3 Sample Size and Criteria for Conformity

(*Clause* J-2.2)

Sl No.	Lot Size	Sample	Sample Size	Cumulative Sample	Acceptance Numbers, *a*	Rejection Numbers, *r*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Up to 1000	First	13	13	0	2
ii)		Second	13	26	1	2
iii)	1001 to 3000	First	20	20	0	2
iv)		Second	20	40	1	2
v)	3001 and Above	First	32	32	0	3
vi)		Second	32	64	3	4

J-2.3 The number of fasteners in the first sample (*see* column 2 and 3 of Table 3) shall be first selected and subjected to all the dimensional tests and the performance tests except the test for reciprocating movement of slider.

J-2.3.1 If in the first sample, the number of fasteners failing in any of these tests is less than or equal to the corresponding acceptance number (*see* column 5 of Table 3) the lot shall be considered as conforming to the requirements of dimensional tests and performance tests.

J-2.3.2 If the number of defective fasteners in the first sample is greater than or equal to the corresponding rejection number (column 6 of Table 3) the lot shall be rejected.

J-2.3.3 If the number of defective fasteners in the first sample lies between the corresponding a and r, a second sample (column 2 and 3 of Table 3) shall be selected at random from the lot and subjected to all the dimensional and performance tests except the test for reciprocating movement of slider. If in the combined sample (column 4 of Table A-3) the number of defective fasteners is less than or equal to the corresponding acceptance number (column 5 of Table 3, the lot shall be considered as conforming to the requirements dimensional tests and performance tests.

J-2.4 In the case of these lots which have been found satisfactory according to **12.2.3** a number of fasteners selected according to column 1 and 2 of Table 4 shall be subjected to test for reciprocating movement of slider. The lot shall be declared as conforming to the above requirements if all the selected fasteners satisfy this requirement.

Table 4 Sample Size and Criteria for Conformity
(*Clause* J-2.2)

Sl No.	**Lot Size**	**Sample Size**
(1)	(2)	(3)
i)	Up to 1 000	3
ii)	1 001 to 3 000	4
iii)	3 001 and above	5

J-2.5 The lot shall be declared conforming to the requirements of this standard if it is found satisfactory according to **J-2.3** and **J-2.4**.