



Designation: D2050 – 23

Standard Terminology Relating to Fastener Subassemblies Used in the Manufacture of Textiles¹

This standard is issued under the fixed designation D2050; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This standard identifies terminology related to subassemblies which are categorized as any component that is used in the construction or assembly of a textile product. Subassemblies can be in the form of components used as closures (for example, slide fasteners, buttons, snap fasteners, hook and loop (touch) fasteners) or methods used to join textile sections (for example, stitches and seams).

1.2 Terms relating to Buttons are found in Section 3.

1.3 Terms relating to Hook and Loop (Touch) fasteners are in Section 4.

1.4 Terms relating to Snap Fasteners are found in Section 5.

1.5 Terms relating to Slide Fasteners are found in Section 6.

1.6 For other terms related to textiles, refer to Terminology D123.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D123 Terminology Relating to Textiles

¹ This terminology is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.54 on Subassemblies. These definitions were developed in cooperation with the American Fastener and Closure Assn. Inc.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

- D2060 Test Methods for Measuring Zipper Dimensions
- D2061 Test Methods for Strength Tests for Zippers
- D3657 Specification for Zipper Dimensions
- D4846 Test Method for Resistance to Unsnapping of Snap Fasteners
- D5169 Test Method for Shear Strength (Dynamic Method) of Hook and Loop Touch Fasteners
- D5171 Test Method for Impact Resistance of Plastic Sew-Through Buttons
- D7142 Test Method for Holding Strength of Prong-Ring Attached Snap Fasteners

3. Terminology

RELATING TO BUTTONS

3.1 Terminology relating to buttons covers a variety of terms having special meanings used in the button industry. These apply only to sew-through flange and shank buttons.

3.1.1 The principal types of button defined in this terminology are illustrated in Figs. 1-8. These figures are descriptive only and are not intended to be restrictive as to design.

assembled button, n—a decorative disc made from a combination of similar or dissimilar materials, such as plastic and metal or metal and metal, which have been joined together by such processes as gluing, swedging or metal stamping.

bridge, n—the area of a button between the holes partially covered by the sewing threads with varying dimensions are determined by design and end use.

button, n—a knot, disc, or similar designed fastener which, when forced through a narrow opening or buttonhole, is able to join one section of a garment or other flexible substrate to another section. **D5171**

DISCUSSION—Although the primary purpose of buttons is to serve as fasteners, buttons can also be used as decoration. **D5171**

centrifugal cast button, n—see **rotation cast button**.

compression molding, n—(as related to button manufacturing) a process that forms a button using material placed in a confined cavity, and by application of pressure and heat.

DISCUSSION—this type of button is produced by compression molding any of the following thermoset molding compounds: (1) urea-formaldehyde; (2) melamine formaldehyde; (3) styrene-modified polyester; or any combination thereof.

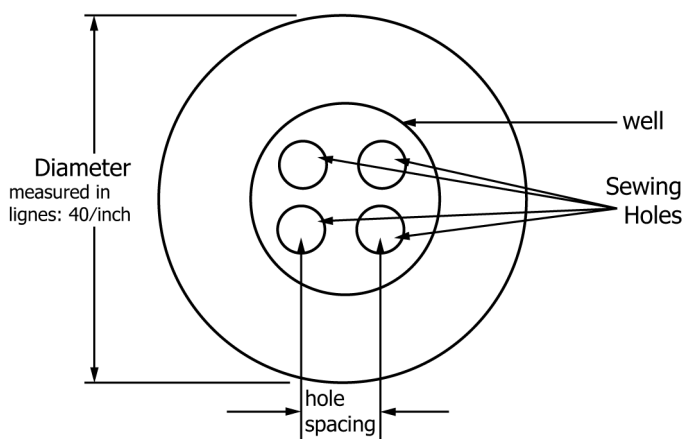


FIG. 1 Sew-Through Flange Button

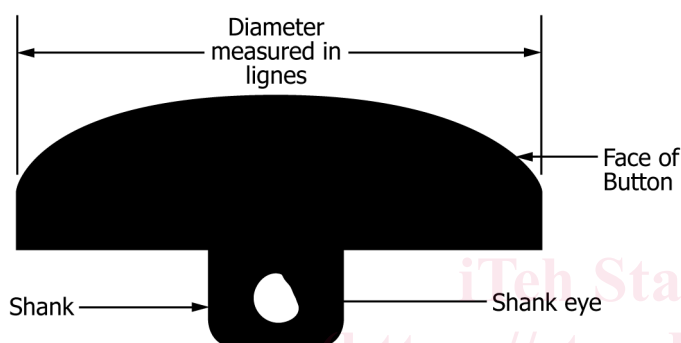


FIG. 2 Sew-Through Shank



FIG. 3 Pin Shank



FIG. 4 "U" Shank



FIG. 5 Stab or Screw Shank Staple Buttons

DISCUSSION—Specific—When using styrene modified polyester resin, which has pearlescent pigments in its formulation and which are oriented in the molding process, the resultant button or button blank can resemble a natural pearl shell button.

dry cleanable button, n—a disc that can be cleaned using a solvent without damage, such as dissolving or loss of finish.

electroplated button, n—plastic discs which have been made conductive by chemical treatment followed by the electroplating of metallic coatings.



FIG. 6 Bell Shank Staple Buttons

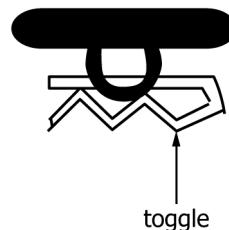


FIG. 7 Toggle Staple Attached Buttons

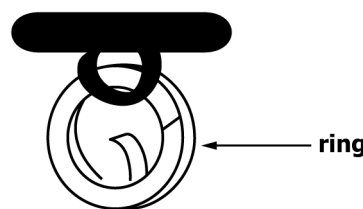


FIG. 8 Ring Staple Attached Buttons

DISCUSSION—Buttons made of plastics, such as polyester, acetate, ABS, melamine, and urea formaldehyde are the materials usually electroplated.

fabricate, v—(as related to button manufacturing), to convert a blank into a completed button.

DISCUSSION—Fabrication may require turning of the face or back of the button with shaping tools, the drilling of sewing holes, and if required the grinding, slotting and any other decorative tooling or shank insertion which may be required.

face, n—as related to buttons, that portion of the disc which will be exposed after attachment to the substrate.

finish, n—in buttons, the surface condition or texture.

hole spacing, n—on a button, the distance from the center of one hole to another.

impact resistance, n—resistance to fracture under the sudden application of an external force. **D5171**

injection molding, n—the process that forms a button using liquefied polymer that is forced, under pressure, through a runner system (sprue, runner, gate(s)) into the cavity of a closed mold.

injection molded buttons, n—a disc which is formed when a liquid polymer used to fill a cavity is exposed to pressure cavity under pressure with polymer that will take the form of the mold when cooled.

laundering, n—(as related to care and maintenance) a process used to refurbish a textile product or parts thereof by (1) cleaning it in water containing a cleaning agent, and possibly bleach, (2) drying it, and (3) usually ironing or pressing it.

laundryability, *n*—the ability of a button to undergo multiple cycles of laundering without damage such as cracks or loss of finish.

ligne, *n*—a unit of measure for button; one ligne equals 0.635 mm (0.025 in.).

luster, *n*—*in buttons*, the degree of brilliance exhibited in pearlized or pearl buttons.

metal cast button, *n*—a disc produced by placing molten metals and metal alloys into either a single-cavity or multiple-cavity molds.

DISCUSSION—Cast metal buttons can be electroplated and treated to produce other finishes.

orientation, *n*—*in buttons*, the degree of order and spatial alignment of pearlescent pigment crystals internally or in a coating.

pearlized, *n*—(*as related to buttons*), the addition of synthetic or natural pearlescent pigments to the button resin formulation or to the formulation used for coating.

DISCUSSION—Buttons exhibiting a pearl-like luster are made in either of two ways: (1) by incorporating pearlescent pigments into the resin formulation prior to casting or molding the button, or (2) by applying to the button an external coating containing pearlescent pigments either by spraying or dipping.

ring, attached button, *n*—a circular connector used to fasten a staple attached button to the substrate.

rod cast button, *n*—a fastener fabricated by cutting or sewing a disc from a rod made from formulated styrene-modified polyester resin.

DISCUSSION—(*as related to manufacturing*) a formulated styrene-modified polyester resin is placed into aluminum or glass tubes which are sealed at one end. The flaccid or rigid rod formed after gelation is removed from the tube and sliced or sawed into button blanks. The blanks are then fully polymerized (cured) in hot brine solution and fabricated into buttons. This method is used for buttons which are mottled, and multicolored.

rotation cast button, *n*—a disc fabricated from a partially polymerized sheet formed in a rotating cylinder [**Synonym—centrifugal cast button; wheel cast button**]

DISCUSSION—A resin mix prepared with catalyzed, promoted, and pigmented styrene-modified polyester resin is poured into a rotating cylinder to form a sheet of uniform layer. When gelled (polymerized) the flexible sheet is sliced in the cylinder for removal from the cylinder. The flaccid sheet is dye cut, with a multi-cutter tool, into button blanks. The blanks are then cured, usually in hot brine solutions, and fabricated into buttons. This method is best for buttons produced with oriented pearlescent pigments, opaque white pigments, and multilayer combination of colors and mottles.

sewing hole, *n*—an opening in either the flange or shank of a button used to attach the button to the substrate using needle and thread.

sew-through flange button, *n*—a disc attached to one part of a flexible substrate by means of needle and thread which are passed through two or more holes in its flange, and through the substrate. (Compare **sew-through flange button**.) (See Fig. 1.) **D5171**

sew-through shank button, *n*—a disc attached to one part of a flexible substrate by means of needle and thread passed through a hole or loop in the integral shank and through the substrate. (Compare **sew-through flange button**.) (See Fig. 2.) **D5171**

shank, *n*—*in buttons*, the extension positioned perpendicular to the surface of disc, designed as either a ring or a toggle at the center back of the flange, and having a hole or loop for use in attaching the button to one part of a flexible substrate using a needle and thread. (See Figs. 3-6.)

shank eye, *n*—the hole or loop in the perpendicular positioned shank that permits the button to be joined to one part of a flexible substrate using a staple.

sheet cast button, *n*—fastener fabricated from a disk blank and a cast sheet of formulated styrene-modified polyester resin.

DISCUSSION—The formulated polyester resin mix is poured into gasketed open molds or between gasketed sheets of glass. After stiffening the sheet is stripped from the mold and die cut into multiple button blanks. The blanks are then cured (fully polymerized) and fabricated into buttons. This method is best for buttons produced with oriented pearlescent pigments or opaque white pigments. (See **rotation cast button**.)

staple, *n*—*in buttons*, a looped metal shank fastener securely positioned perpendicular to and at center back of the button flange used to attach the button to one part of a flexible substrate by means of a needle and thread, a ring, or a toggle.

toggle, *n*—a clip used to fasten a staple button to the flexible substrate.

toggle attached staple button, *n*—a button attached to one part of a flexible substrate by using a toggle rather than a needle and thread.

DISCUSSION—The staple button passes through an eyelet in the flexible substrate and is secured by the toggle that passes through the staple eye. (See Fig. 7 and Fig. 8.)

two-front button, *n*—a disc in which the shape of both the face and back are identical.

DISCUSSION—Identical faces allow for easier feeding of buttons in automatic sewing machines without the use of a well for side-selection

vacuum plated button, *n*—a disc that is made with a flash metal, coated in a vacuum chamber and subsequently colored to simulate other metallic finish appearances.

DISCUSSION—This is the least durable of metallized finishes.

well, *n*—*as related to buttons*, a recess in center of sew-through flange button that give aesthetics and identifies the face side.

wheel cast button, *n*—see **rotation cast button**.

4. Terminology

Related to Hook and Loop (Touch) Fasteners

hook and loop fasteners, *n*—a touch fastener, comprised of two flexible mating strips, the surface of one mating strip being covered with tiny, stiff protrusions shaped liked hooks which engage the other mating strip which is covered with pliable loops.

DISCUSSION—This fastener comprises a non-adhesive method of joining two materials where ready adjustment and removal is desirable and fastening is accomplished by pressing the mating strips together and separation is accomplished by peeling the tapes apart. Hook and loop fastening systems can have other types of hook tape component designs which demonstrates a higher fastening strength in the shear direction. **D5169**

shear strength, *n*—the resistance to forces that cause, or tend to cause, two contiguous parts of a body to slide relatively to each other in a direction parallel to their plane of contact. **D5169**

DISCUSSION—Shear strength can be tested in the lengthwise direction or in the lateral direction on the two contiguous parts. **D5169**

5. Terminology

Related to Snap Fasteners

5.1 Terminology relating specifically to snap fasteners includes illustration of prong-ring attached fastener parts in Fig. 9. These figures are descriptive only and are not intended to be restrictive as to design.

force, *n*—(as related to snap fasteners) The measured upward and diagonal peel strength exerted on the interconnection between a socket and a stud that results in the disconnection and separation of both elements. **D7142**

holding strength, *n*—(as related to snap fasteners), the measured force required to separate the prong-ring and its attached mating element (socket or stud) from the substrate to which the prong-ring is attached.

DISCUSSION—(as related to the separation of elements) a diametric force is applied along the edge of the fastener so that the disengaging force used to unsnap a snap fastener is usually applied at the edge of the fastener. **D7142**

lateral holding strength, *n*—the measured force required to disengage the stud and socket of a snap fastener that results from a pull in the plane parallel to the material to which the snap fastener is attached. **D4846**

prong-ring type fastener, *n*—generic name for the element used in conjunction with either a socket or a stud of a snap

fastener that penetrates through fabric to mechanically set a matching socket on one side of a closure, a matching stud on the facing closure which allow the outer and inner closure facings to be snapped together. (See Fig. 9.) **D7142**

snap action, *n*—the force required to disengage a snap fastener resulting from a pull exerted perpendicular to the plane of material to which the snap fastener is attached. (See force.) **D4846**

snap fastener, *n*—a device for attaching one material to another consisting of matching male and female parts, each of which is attached to a separate material so that the parts can be joined by a low compressive force and separated by a low perpendicular tensile force. **D4846**

socket, *n*—in snap fasteners, the female functional part of the fastener which engages with the stud part of the fastener to form the closure of two parts of the item on which the fastener is used. (See Fig. 9.) **D7142**

DISCUSSION—Prong-ring attached socket or stud snap fasteners are designed to be mechanically attached to garments or other items through the deformation interaction of the prong-ring with the socket or stud. Other forms of snap fasteners exist which may be attached to the foundation of the garment or other item by means of sewn threads or adhesive bonding. **D7142**

strength, *n*—the property of a material that resists deformation induced by external forces. **D7142**

DISCUSSION—The deformation related to the separation of the prong-ring from the socket or stud of a snap fastener. **D7142**

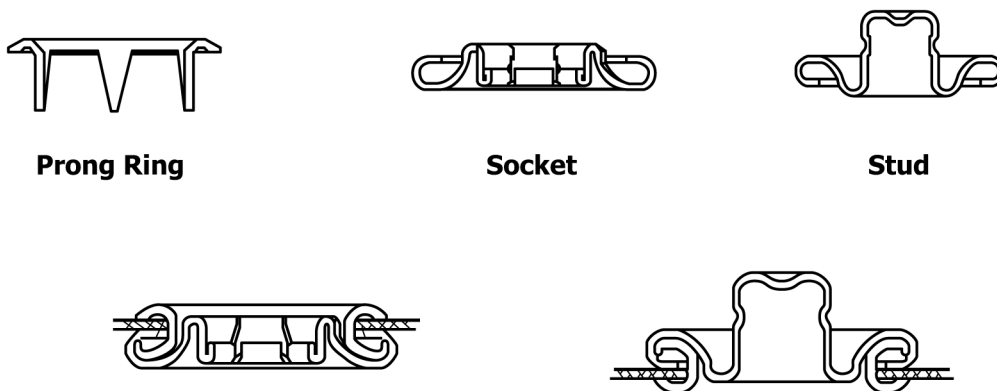
stud, *n*—in snap fasteners, the male functional part of a snap fastener which engages with, or snaps into, the mouth of the socket to form a closure of two parts of the item, or garment on which the fastener is used. (See Fig. 9.) **D7142**

DISCUSSION—See socket. **D7142**

6. Terminology

Relating to Slide Fasteners

6.1 Terminology relating specifically to the principle parts of slide fasteners defined in this terminology are illustrated in



Prong Ring Attached to socket or stud

FIG. 9 Prong-ring Attached Fastener Parts

Figs. 10-19. These figures are descriptive only and are not intended to be restrictive as to design.

automatic lock slider, *n*—a slider that provides involuntary, positive locking action on the chain when the pull is released restricting the movement of the slider to open the chain unless a stress is applied through the stringers that exceeds the locking capacity of the slider. **D2061**

bail, *n*—a portion or portions of the slider to which the pull or pulls are attached. (*Syn. lug.*)

bead, *n*—in a continuous element woven type slide fastener, a section of the tape where a cord and/or selected warp yarns are woven in place by the weft yarns of the tape to form a bead.

DISCUSSION—The continuous element is secured to the tape by the bead simultaneously with the bead formation.

bead, *n*—in a continuous element woven typeslide fastener, a section of the tape where a cord and/or selected warp yarns are woven in place by the weft yarns of the tape to form a bead. The continuous element is secured to the tape by the bead simultaneously with the bead formation.

bead, *n*—in a continuous element sewn type slide fastener, a section of tape where a cord is attached to the tape by sewing.

DISCUSSION—A cord is optional on continuous element sewn type slide fastener.

bottom assembly, *n*—the components of the lowermost part of a slide fastener that determines whether the slide fastener will be non-separable or separable. (See also “**non-separable**” slide fastener and “**separable**” slide fastener.)

bottom stop, *n*—a part affixed to both stringers immediately below, or over the chain, holding the two stringers together at the bottom and preventing the slider from leaving the chain when opening the chain. (See Fig. 10.)

bridge top stop, *n*—a part affixed immediately above the chain, holding the tops of two stringers together and preventing the slider from leaving the chain when closing the chain. See Fig. 11.)

cam lock slider, *n*—a slider that incorporates a curled projection or projections on the pull that extends through a window or windows to effect a locking action by pressing against the interlocking elements when the cam lock slider is in the locked position.

chain, *n*—the portion of a slide fastener, without its components (top stops, bottom stops, slider, separating parts, etc.),

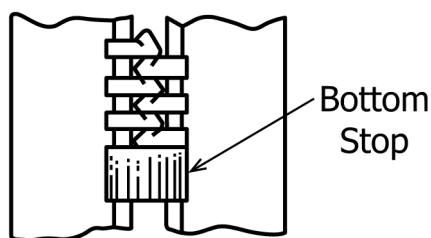


FIG. 10 Bottom Stop

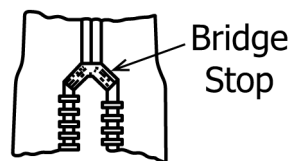


FIG. 11 Bridge Stop



FIG. 12 Top Stop

that is formed by alternately interlocking the elements of one stringer with the elements of an opposing stringer.

chain front, *n*—general reference of the slide fastener when viewed from the element side on a continuous element fastener (CEF).

DISCUSSION—For slide fastener designs where the chain is bilaterally symmetrical (such as an IEF) the front is generally referenced by the location of the slider tab, on a single tab slider, when opening or closing the chain.

chain thickness, *n*—the measurement from front to back of the chain. On a continuous element fastener (CEF) the measurement includes the tape and sewing threads on a sewn type fastener or the tape and yarns for securing the element to the tape on a woven type fastener if these parts extend beyond the element.

chain width, *n*—the measurement between the shoulders of the interlocked elements or between the outermost edges of the bead if the bead extends beyond the elements.

connecting ring, *n*—a device used to secure a pull, having more than one component in its design, to the bail of the slider. The connecting ring may be of various shapes.

continuous element, *n*—a configured element formed continuously from a length of monofilament into the shape of a spiral (or coil), serpentine or other configuration.

DISCUSSION—The continuous element contains heads formed along its length at the crimp for the purpose of interlocking. The side of the continuous element opposite the crimp is the shoulder and bears the slider flanges during opening and closing of the elements. (Compare **separate element**.)

continuous element slide fastener, *n*—CEF, can be a sewn type or a woven type.

DISCUSSION—The sewn type CEF is a slide fastener consisting of two continuously formed elements, each attached to one of the opposing edges of two tapes, which are engaged and disengaged by the movement of a slider. The continuous elements of the sewn type CEF are formed separately from the tapes and later joined by sewing. The CEF woven type slide fastener consists of two continuous elements formed integrally with the tape, which are engaged and disengaged by movement of the slider. (See Fig. 12.) (Compare **individual element slide fastener**.)

cord, *n*—a strand of multiple yarns either twisted, knitted or a combination.

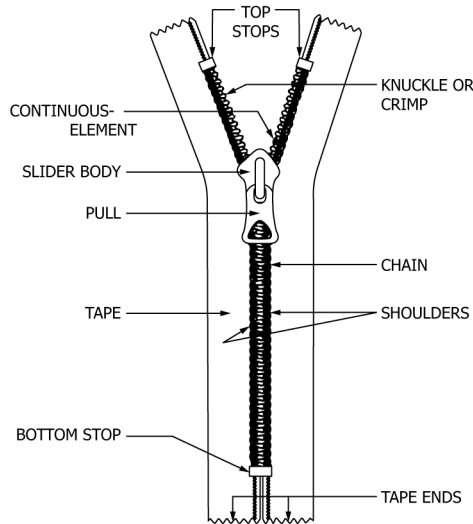


FIG. 13 Principle Parts of Slide Fasteners – Continuous Element Slide Fastener

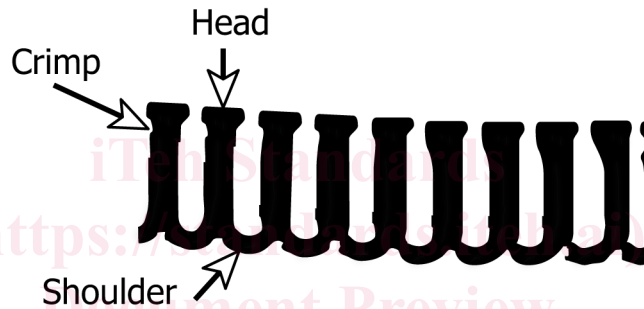


FIG. 14 Element (one side of element on sewn type CE fastener)

DISCUSSION—The cord is used in conjunction with weft yarns of the tape on an individual element fastener, the sewing thread on a continuous element sewn type fastener or the weft yarns and warp yarns (optional) on a continuous element woven type fastener to form a bead.

DISCUSSION—The fixed retainer has an opening shaped to fit the separable pin. In order to close the chain, the separable pin is passed through the slider body and then inserted into this opening. The fixed retainer holds or retains the two stringers in alignment for interlocking. The fixed retainer is sometime referred to as the “box”.

crimp, *n*—as applied to a continuous element slide fastener, the predetermined formation of the monofilament cross-section at the point where the continuous element is interlocked.

cut-off, *n*—the measurement of an individual element from the head side to the pocket side of the legs.

diamond, *n*—the wedge-shaped portion of a slider between the throats.

differential shrinkage, *n*—in zippers, the difference in longitudinal dimensional change between the zipper tape and the fabric to which the zipper is attached.

element, *n*—a device designed for interlocking, capable of being affixed along the edge of a tape. (Compare **continuous element** and **individual element**.) (See Fig. 13.)

exposed tape width, *n*—the part of the tape extending beyond the shoulders of the interlocking elements to the outer tape edge.

fixed retainer, *n*—a device permanently attached to the retainer pin at the bottom of one stringer. (See Fig. 14.)

flange lock slider, *n*—a slider with notches in the flanges of the slider that block the shoulders of the elements when the stringers above the slider are pulled apart, thus preventing further separation of the chain.

flanges, *n*—the edges of the slider formed to contain the chain.

head, *n*—on an individual element fastener, the portion of an element that engages the pocket of another element on an opposing stringer of the fastener during closing.

head, *n*—on a continuous element fastener, partially flattened area of the monofilament located at the crimp. The flattened area forms a mushroom like shape on each crimp of the element that interlocks with the two heads of the element on an opposing stringer.

individual element fastener, *n*—a slide fastener consisting of two series of individually formed elements, each attached to one of the opposing edges of two tapes, which are engaged and disengaged by the movement of a slider. (See Fig. 15) (Compare **continuous element slide fastener**.)

knuckle—See preferred term **crimp**.

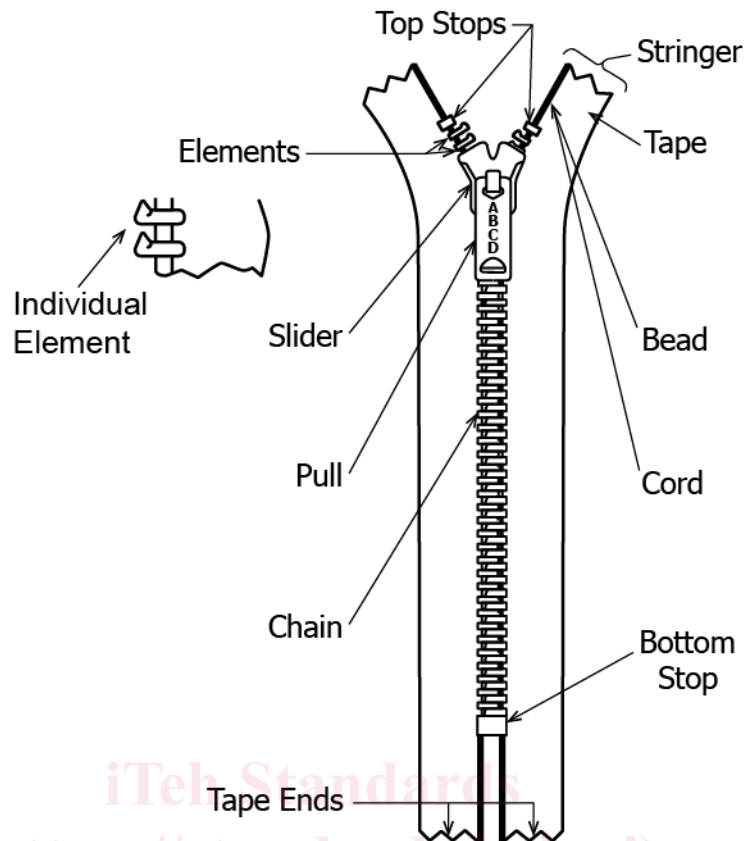


FIG. 15 Principal Parts of Slide Fasteners – Individual Element Slide Fasteners

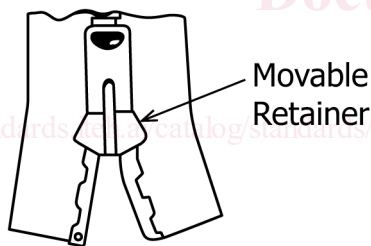


FIG. 16 Movable Retainer

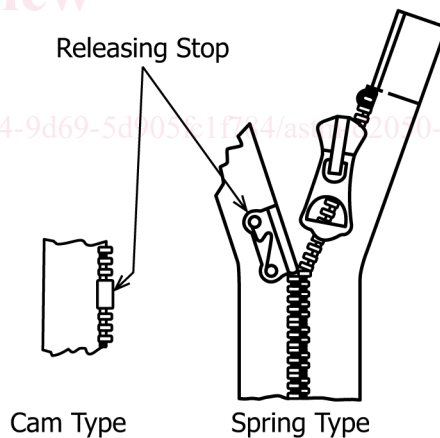


FIG. 17 Releasing Stops

legs, *n*—the two portions of an individual element that affix the element to the bead.

lug—See preferred term **bail**.

mouth, *n*—the opening in a slider that receives the chain.

mouth width, *n*—the measurement between the slider flanges at the point where they bear against the shoulders of the interlocked elements.

movable retainer, *n*—a movable or sliding device performing a similar function to that of the fixed retainer, yet able to open and close the chain like a slider.

DISCUSSION—The purpose of the moveable retainer is to permit separation of the two stringers from the bottom, while the stringers remain connected at the top by the moveable retainer and slider on the slide fastener. (See Fig. 16.) A slider fastener with a moveable device is sometimes referred to as a “Two Way” separable fastener and

is able to function like a separable fastener when using the slider. This device is not removable from the bottom of the slide fastener.

non lock slider, *n*—an engagement component that does not contain a locking mechanism allowing free movement of the slider to open the chain when a force is applied without restriction by a locking device.

DISCUSSION—Sometimes referred to as a Free Slider.

nonseparable slide fastener, *n*—an engagement component having two stringers that are permanently attached to each other at one or both ends. (See Fig. 16.) (Compare **separable slide fastener**.)