

Zippers: Types, Parts, Sizes and How to Choose One

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In one paragraph

A zipper, also called a zip or a slide fastener, closes an opening with two rows of interlocking teeth, each row fixed to a fabric tape. A slider runs along the rows: pulled one way it meshes the teeth into a closed chain, pulled the other way it parts them. Zippers are sorted by their teeth, which are metal, moulded plastic or a continuous plastic coil (an invisible zipper is a coil zipper whose teeth hide behind the seam), and by how they end: a closed-end zipper stays joined at the bottom, an open-end zipper comes fully apart, and a two-way zipper has two sliders. The size number, such as #3, #5 or #10, stands for the width of the closed chain, which is close to that many millimetres: the larger the number, the heavier and stronger the zipper.

At a glance

Types of zippers by their teeth

Type	Teeth	Strengths and limits	Typical uses
Metal	Separate teeth clamped on the corded edge of the tape. Coats, which makes Opti zips, says its metal zips are normally brass teeth on polyester tape, with aluminium for lighter zips; YKK lists brass, aluminium and nickel among its metals	The most traditional type, strong and hard-wearing. Brass can discolour in washing and storage, nickel can cause skin allergy, and aluminium reacts to acids and alkalis	Jeans and trousers, jackets, bags and leather goods
Moulded plastic	Separate teeth injection-moulded from plastic, usually polyacetal (POM), on polyester tape; polypropylene for clear teeth (Coats). YKK's moulded zipper is VISLON	Lighter than metal of the same size, YKK says, and made in a wide range of colours. Polyacetal is damaged by strong acids, and it takes less heat than a coil: YKK sets 130 °C as its ironing limit	Outerwear and sportswear, cold-weather and outdoor gear
Coil	One continuous plastic monofilament wound into a spiral, "such as polyester or nylon" (YKK). Coats describes a coil of monofilament, normally polyester, wrapped round a polyester cord and sewn onto two tapes; in a spiral zip the monofilament is woven into the tape as it is made	The most flexible, flat and round curves, and the softest of the three. Still called "nylon zips" from the material once common, Coats explains, though most are now polyester	Skirts, trousers and dresses, bags, tents and sleeping bags
Invisible (concealed)	A coil zipper with the tape folded behind the coil, so that from the front only the seam shows. It is sewn with a special foot (Coats). YKK's is CONCEAL	Not for heavy use: YKK does not recommend it for backpacks, luggage or marine use, and says the slider must be pulled straight along the teeth, not at an angle	Dresses and skirts

Key figures and their sources

- One European maker, KOH-I-NOOR of Prague, gives the widths of its own metal zippers as 5.0, 6.0 and 8.0 mm for the sizes it names MS5, MS6 and MS8, and its moulded PH8 as 9.0 mm (KOH-I-NOOR zip catalogue, p.

Source: KOH-I-NOOR zip catalogue (kin.cz)

- Other makers set their own: KOH-I-NOOR allows ± 0.5 cm up to 25 cm, ± 1 cm from 26 to 100 cm, $\pm 1\%$ from 101 to 500 cm and ± 5 cm beyond (KOH-I-NOOR zip catalogue, p.
Source: KOH-I-NOOR zip catalogue (kin.cz)
- 30mm longer than the actual garment opening” (YKK fastening catalogue, p.
Source: YKK fastening catalogue (ykkamericas.com)
- YKK gives the ironing limits as 160 °C for coil and CONCEAL zippers and 130 °C for VISLON moulded zippers, and asks for the zipper to be closed, the pull lying flat and a cloth laid over it; ironing directly on the zipper “may cause melting, deformation and/or color change” (YKK manual, p.
Source: YKK manual (ykkamericas.com)
- ASTM D4465 is the performance specification for the fly zippers of jeans, dungarees and work trousers made from heavy denim of about 475 g/m² (ASTM), and ASTM D3692 the guide to choosing zippers for care-labelled goods (ASTM).
Source: ASTM (store.astm.org)
- YKK, which tests to both, describes it: “An engaged zipper chain is pulled crosswise” at a constant speed, in clamps 25 mm wide moving at 300 mm a minute, and the result is given per 2.5 cm of chain (YKK Americas, product testing methods).
Source: YKK Americas, product testing methods (ykkamericas.com)

Test yourself

Ten questions on this topic. Answer them without looking, then check on the last page.

1. What does the size number of a zipper, such as #5, stand for?
2. In a zipper, what is a stringer?
3. How does the slider of a zipper bring the two rows of teeth together?
4. On an open-end (separating) zipper, what replaces the bottom stop?
5. What plastic are moulded zipper teeth usually injection-moulded from?
6. What is an invisible (concealed) zipper?
7. In the JIS S 3015 weight classes, what chain width is a medium zipper, and which YKK size falls in it?
8. What length tolerance does YKK apply to a zipper up to 30 cm long?
9. Three zipper chain specimens burst at 420, 455 and 398 N in a crosswise test; what is their mean?
10. What is the EU REACH limit on nickel release from zippers used in garments?

Answers

Each answer is stated in the article; the section to read again is named after it.

1. **The width of the closed chain, close to that many millimetres.**
See: Opening
2. **A tape with its row of teeth.**
See: Parts of a zipper
3. **A Y-shaped channel inside it brings the rows together at an angle so they mesh.**
See: Parts of a zipper
4. **An insertion pin on one stringer and a retainer box on the other.**
See: Parts of a zipper
5. **Usually polyacetal (POM).**
See: Types of zippers by their teeth
6. **A coil zipper with the tape folded behind the coil, so only the seam shows from the front.**
See: Types of zippers by their teeth
7. **5.5 to under 7 mm; a #5 zipper.**
See: Zipper sizes: what #3, #5, #8 and #10 mean
8. **Within ± 5 mm.**
See: Zipper sizes: what #3, #5, #8 and #10 mean › How to measure a zipper's length, and the tolerance
9. **424.33 N.**
See: Crosswise strength, worked through
10. **0.5 $\mu\text{g}/\text{cm}^2$ a week from the parts touching the skin.**
See: Nickel release from metal zippers

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