

**YKK**

*Little Parts. Big Difference.*

Fastening Products Group

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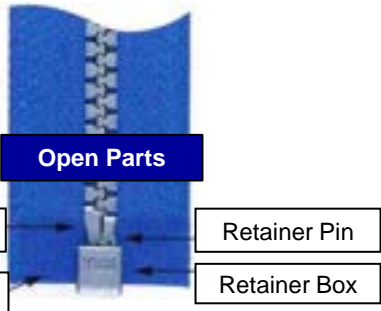
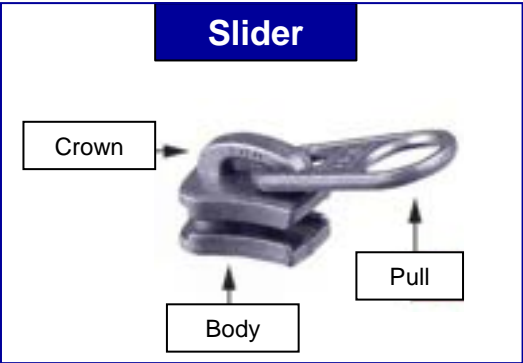
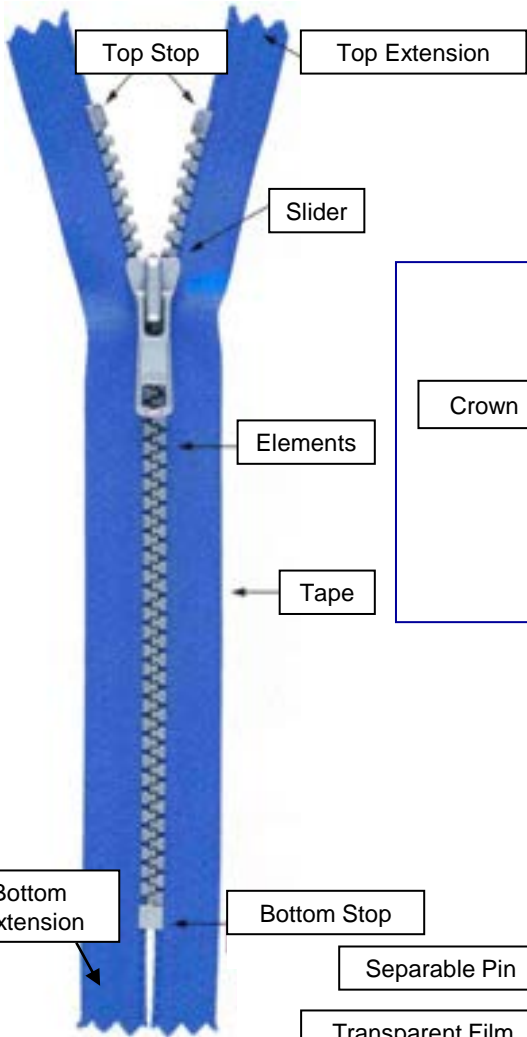
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# Section 1: Zipper Basics <<<<<<<

## Zipper Structure



**Closed-End Zipper**

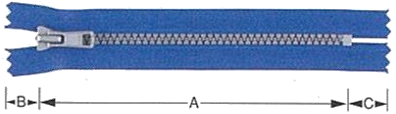
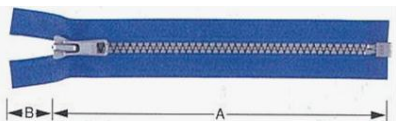

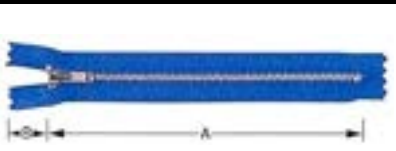
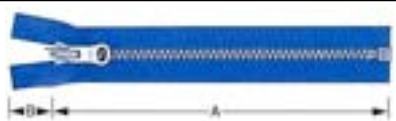
**Open-End Zipper**

# >>>>>>> Section 1: Zipper Basics

## Zipper Dimension 1-2

### Zipper Dimension Measurement:

Please completely close the zipper and place flat when measuring.

Type	Dimension (A)	Top Extension (B)	Bottom Extension (C)	Picture
Closed End	Slider Top End to Bottom Stop End	Top Stop End to Tape End	Bottom Stop End to Tape End	
Open End	Slider Top End to Box End	Top Stop End to Tape End	--	
Two Way Open	Slider Top End to Reinforced Tape End	Top Stop End to Tape End	--	
Closed End (Exposed Top Stop)	Top Stop End To Bottom Stop End	Top Stop End to Tape End	Bottom Stop End to Tape End	
Open End (DU Slider)	Slider Shoulder To Box End	Top Stop End to Tape End	--	

### Zipper Dimension Tolerance (Based on JIS-S3015):

Please well note below dimension tolerance before ordering YKK zippers.

Dimension	Tolerance
$D \leq 30 \text{ cm}$	within $\pm 5 \text{ mm}$
$30 \text{ cm} < D \leq 60 \text{ cm}$	within $\pm 10 \text{ mm}$
$60 \text{ cm} < D \leq 120 \text{ cm}$	within $\pm 15 \text{ mm}$
$120 \text{ cm} < D$	within the specified length $\pm 2.0\%$

\* Products with special specifications/requirements may not follow above tolerance. Please contact us should you have any dimension requirement.

# Section 1: Zipper Basics <<<<<<<<

## 1-3 Light Sources & Metamerism

### Standard Colors in YKK Color Card

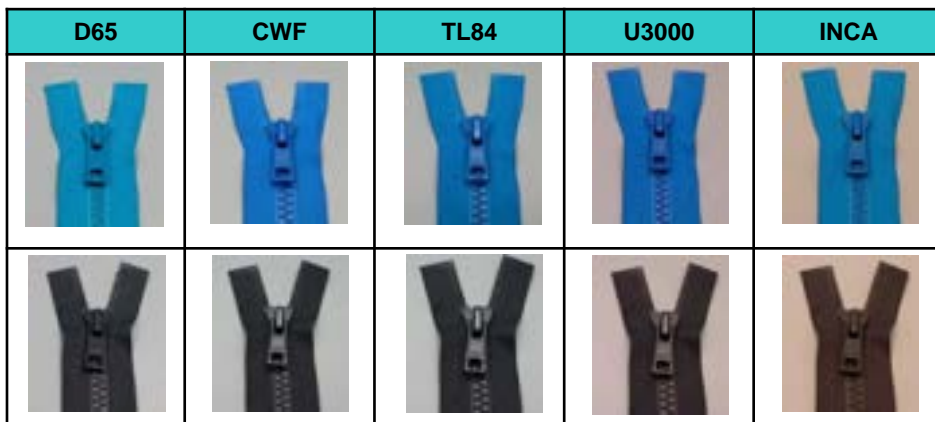
D65 is the standard light source for all the standard colors of the YKK Color Card. Please match your fabric color with the YKK color card under the D65 light source of the light box. The selection of light sources other than D65 for the color matching with the standard colors (YKK Color Card) may result in the color difference problem found between the dyed zipper and garment fabric regarding the fact of metamerism – an obvious change in color of material subjected to different lighting.

### Common problems due to Metamerism of Different Materials

Regarding that metamerism would be resulted from difference in colorants (e.g. dyestuff, pigments...etc.), color difference problems may take place under the following circumstances:

- Noticeable color difference observed between the garment fabric and the zipper under the fluorescent lighting in the office;
- Color difference found among the zipper components, i.e. zipper tape, slider and elements (zipper chain);
- Customer selected and approved zipper tape colors by matching the garment fabric based on YKK Color Card under light source other than D65.

### Examples of Metamerism of Zippers



### To Minimize the Color Difference problem due to Metamerism

- Please use D65 light source for all the standard colors selected from YKK Color Card;
- When light sources other than D65 (such as CWF, TL84, U3000, INCA...etc.) is used, please specify for DTM (Dye-to-match) under the specific light source for color approval.

**\*Note: For DTM (Dye-to-match) processing, customers are advised to submit fabrics with size over 3cm x 3cm for high accuracy on color searching and assessment.**

## >>>>>>> Section 1: Zipper Basics

### High & Low Temperature Limit 1-4

YKK zippers are used in various fields.

In order to ensure the full performance of each zipper, please note the following precautions regarding temperature.

#### Storage Environment

It is suggested to store zippers in an environment of  $20 \pm 15$  °C and  $65 \pm 20\%$  RH.

Harsh environment could cause discoloration, deterioration and/or corrosion of zippers.

#### Ironing

Garments are sometimes subjected to ironing or heat press at various temperatures depending on the garment materials. Zippers also have proper ironing temperatures as follows:

<b>Coil Zipper</b>	<b>up to 160 °C</b>
<b>VISLON® Zipper</b>	<b>up to 130 °C</b>
<b>25FK Zipper</b>	<b>up to 150 °C</b>

Please close up the zipper with the puller properly positioned, not reversed or upright, and place a piece of cloth on. Ironing directly on the zipper may cause melting, deformation and/or color change of zipper.

#### Resistance to Low Temperature

Material properties could also change as the temperature goes down, therefore strength / performance of zipper may also be affected.

Tests show that the zipper operation resistance may become slightly tougher, or zipper metal parts may stick to human skin at extremely low temperatures ( $-40$  °C).

In the case of plastic injected zippers, the elements could be easily broken at impact as the plastic material gets brittle in very cold temperatures.

Based on examples above, it is strongly suggested that you conduct preliminary tests to determine performance of the zipper if the final product is to be used in a harsh environment of very high or very low temperatures. YKK may be able to assist you by providing data or conducting testing under specified conditions at your request.

## Section 1: Zipper Basics <<<<<<<<

### 1-5-1 Needle Detector Test & KENSIN® Products

Many garment factories conduct needle detection before shipment, in order to prevent such dangerous objects as broken needles, sewing needles or marking pins from being left in the garment.

As various types of needle detectors of various sensitivity are used, "Needle Detection Level" is evaluated by comparison with the reaction level of specified steel balls.

Japan apparel industry reported the reaction level of possible dangerous objects as follows:

Broken Needle	Steel Ball of $\phi$ 1.2 mm
Marking Pin	Steel Ball of $\phi$ 2.5 mm
Metal in Shoulder Pad	Steel Ball of $\phi$ 1.0 mm

Testing is conducted with the sensitivity level properly set to detect the target object. Here, in order for metal accessories such as zippers or hooks in the garment not to interrupt the testing, standards for accessories that are needle-detector compatible were set as follows:

Target Object & Steel Ball Reaction Level		Reaction Level required for Accessories	Applicable Accessories
Broken Needle	$\phi$ 1.2 mm	$\leq \phi$ 0.8 mm	Zippers, Hooks
Marking Pin	$\phi$ 2.5 mm	$\leq \phi$ 1.5 mm	Buttons
Metals in Shoulder Pad	$\phi$ 1.0 mm	$\leq \phi$ 0.8 mm	Shoulder Pads

Accessories meeting above requirements are called "NC (Needle Care)" products. Examples are:

Accessory	Quantity	Reaction Level	Specification
Zippers	3 pcs parallel	$\leq \phi$ 0.8 mm	NC-A
Hooks	3 pairs parallel	$\leq \phi$ 0.8 mm	NC-A
Buttons	5 pcs x 2 lines	$\leq \phi$ 1.5 mm	NC-B
Marking Pins	3 times/pc x 10 pcs	$\geq \phi$ 4.0 mm	NC-X

YKK provides needle-detector compatible products as follows. Each special item meets the following reaction level when 3 pcs zippers are passed through the specified type detector.

Please be sure to specify the following special specification for products that are subjected to needle detection.

Special Code	Reaction Level	Test Target (Reaction Level)
<b>KENSIN®</b>	$\leq \phi$ 0.8 mm	Broken Needle ( $\phi$ 1.2 mm)
<b>ND-B</b>	$\leq \phi$ 1.5 mm	Marking Pin ( $\phi$ 2.5 mm)

\* "ND-B" is a special specification utilized locally in China and Asia regions.

## >>>>>>> Section 1: Zipper Basics

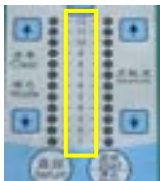
### Needle Detector Test & KENSIN® Products 1-5-2

#### Frequently Asked Questions

**Q: Which sensitivity level does YKK employ? / Is YKK's machine set at Level XX or higher?**

A: Detection level differs in different devices located in different locations, therefore the sensitivity level of the device (Level XX) doesn't really have consistency.

YKK evaluates the needle detection level of the newly developed products by the reaction level in comparison with that of standard steel balls.



**Q: The garment cannot pass the test at our factory. Could you please check it with YKK's device?**

A: The needle detection level of zippers is evaluated by the reaction level of 3 pcs zippers, therefore with the garment with only 1 zipper we could check for possible alarm causes but cannot confirm the detection level of the concerned zipper. Please provide more than 3 pcs zippers of the same lot. Also please understand that sometimes detachment of the zipper from the garment sample is needed and it may be necessary to cut up the garment to find the source of contamination.

**Q: Why is it that zippers having the reaction level of  $\phi$  1.0 - 1.2 mm cannot pass the garment test of  $\phi$ 1.2 mm level?**

A: As the reaction level could differ by the type or accuracy of the device, or position or orientation of the zippers on the garment, accessories compatible with the test with  $\phi$  1.2 mm level are required to have the reaction level lower than that of  $\phi$  0.8 mm steel ball. Zippers with reaction level equivalent to  $\phi$ 1.0 mm may not necessarily pass  $\phi$  1.2 mm level test.

Please specify KENSIN® products (reaction level lower than  $\phi$  0.8 mm) for garments subjected to  $\phi$ 1.2 mm level test.

**Q: MN zippers cannot pass the test. Why is that?**

A: Metal zipper teeth are mainly made of copper alloy, which is compatible with needle detection.

MN zipper teeth, however, are made of manganese, which is slightly magnetic. Therefore, please note that MN zippers are NOT KENSIN® products.



# Section 1: Zipper Basics <<<<<<<<

## 1-5-3 Needle Detector Test & KENSIN® Products

### Other Possible Causes of Alarms

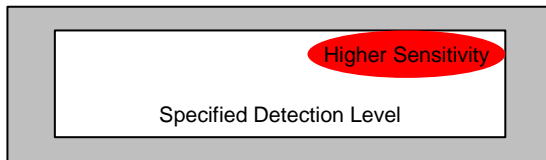
YKK can guarantee the needle detection level of zippers only and the detection level of the whole garment should be assured by the producer of the final garment.

Please first check the following possible causes when the garment cannot pass the test:

1. A broken needle is left in the garment (especially at the seam area or in thick / folded part).
2. Some foreign magnetic object (e.g. metal chip / flake / wire) is mixed in the garment filling (e.g. down).
3. The garment has too many metallic accessories (stoppers / snap buttons / studs).  
(Detection level of each part is added up and could exceed the level.)
4. The conveyor belt is contaminated by some foreign object.
5. Print / hang-tag somehow affects the magnetic field. Defect-marking sticker is left attached.
6. Wash treatment (e.g. stone washing) contained metallic impurities which remain on the garment.

Also, alarm from needle-detector compliant products is sometimes reported, due to slight sensitivity level variance within the detection unit, as follows:

E.g. The zipper passed through an area having higher sensitivity than specified.



\* Different device has different (higher / lower) sensitivity area.

YKK evaluates the needle detection level by passing zippers through the center of the detection unit, which is the area of lowest sensitivity with our device.

Please check and understand the sensitivity difference within the detection unit of the your device before conducting the test.

\* Please contact YKK representatives regarding methods of checking / adjusting the detection level.

## >>>>>>> Section 1: Zipper Basics

### Needle Detector Test & KENSIN® Products 1-5-4

#### Proper Use of Needle Detector

Needle detector test results are highly affected by the location or the environment of the device. Please ensure proper installation, operation and maintenance following the manufacturer's instructions. The following factors are commonly known to affect test results:

##### Humidity

Humid environment is preferred for testing as dry and windy environment could disturb the magnetic field.

##### Air Conditioner

The air conditioner should be shut off during testing as it can disturb air flow.

##### People Movement

Frequent opening / closing of a door near the test area could also disturb air flow and the magnetic field.

##### Magnetic Objects

The detector shouldn't be placed near magnetic materials / objects or in area with noise or vibration (e.g. production equipment). Vehicles or transport equipment should not pass close by.

#### Use of Hand-Held Type Needle Detector

The hand-held type detector can be used to scan the garment and spot the problem area.

**\* Before checking, please make sure to remove such magnetic objects as watch, jewelry, etc.**

- Make sure that the detection level of the detector is properly set.
- Hang the garment as shown, rather than placing flat on the table, if possible.
- Move the detector over the fabric at an appropriate speed, according to the detector's instructions. The detector shouldn't touch the garment or be moved too fast / slow to prevent any false alarm.



## Section 2: Precautions on Wash/Wet Processing <<<<<<<<<

### 2-1 Why YZiP® products are recommended for Stone / Enzyme Washes?

#### To avoid damages of elements due to harsh treatments

The dimensions of the elements (zipper chain) as well as the zipper tape specifications of YZiP® products are reinforced which is comparatively stronger than the standard metal zippers under the forceful or harsh treatments during stone / enzyme washes.

#### Higher corrosion resistance and less slider lock malfunction problem

The basic material of GS/GA type slider is brass, whereas the DA type is made from zinc alloy. It is generally known that brass has higher resistance to corrosion and abrasion than the zinc alloy. Therefore, the GS/GA type slider would be recommended for stone / enzyme washes in which the zippers would have higher probability in suffering from strong chemicals and physical damages during the garment wet processing.

Also, regarding the stainless steel nature of the slider lock pin, in addition of the special designed structure of the locking mechanism, GS/GA type slider has the stronger locking strength than the normal automatic-lock sliders which would be less affected under the harsh washing conditions.

YZiP® + GS/GA slider is recommended for stone / enzyme wash instead of standard MF + DA slider, because the slider cover may become loose and come off due to the dissolving / corrosion of the metals.

#### Possible problems of YZiP® products occur under Stone / Enzyme Washes

##### Color Change of Zipper

Copper elements of brass would react with the chemicals in stone / enzyme washes and result in the color change problem of zipper.

##### Staining Migration problem

The physical abrasion on the metal surface of the zippers would cause the come-off of metal dust. When such metal dust is mixed with the stone particles or dirt washed off from the garment, stain migration may occur on the garment fabrics.



Slider damage due to the dissolving of zinc alloy slider under strong chemical treatments in garment processing.



Corrosion took place on zinc die-cast slider pull under the strong chemical treatments.

## >>>>>>> Section 2: Precautions on Wash/Wet Processing

### Change in Metal Zipper Color by Garment Dye Treatment 2-2

During the garment dye processes, different kinds of dyestuff and auxiliaries would be used depending on the nature of the garment fabrics. For example, for the cotton fabrics, sulfur dye, reactive dye or direct dye may be used while acid dye is usually used for the dyeing of the nylon products...etc. Moreover, the usage of various chemicals such as reducing agents, oxidizing agents, acids and alkalis is rather common.

When these dyestuff and chemicals are abundant in process, color change of the metal components of the zipper may occur and occasionally, the stain migration on the garment fabrics would take place.

Chemical reaction may take place when the metal components (including elements, slider, top tops, bottom stop and open parts) of the zipper are in contact with different kinds of chemicals and the color change or staining problem would probably be resulted. Also chemicals in the dyestuff could react with those metal components and may cause decoloration (bleaching) or discoloration of the fabrics. The appearance of the color change may vary from time to time depending on (but not limited to) the following factors:

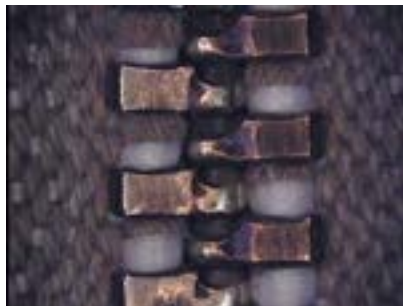
- Nature and concentration of dyestuff / chemicals used;
- Processing temperature during the garment dye treatment;
- Length of the processing time;
- Stain resistance of the garment fabrics

Very often, the color change / staining problem would further be accelerated when the zippers are kept / pressed against the garment fabrics under the wet state (or in high humid environment) for long time.

Regarding the properties of metals, chemical reaction problem can hardly be avoided when the metal zippers are subjected to the garment dye processing. For this reason, it would greatly be advised that the zippers should be applied in the garment after the garment dye processing. Also, in case the reaction with the residue dyestuff or chemicals on the garment fabrics, the garment fabrics should be thoroughly neutralized, rinsed and dried immediately after the garment dye treatments.

In any case that the zippers have to be subjected to the garment dye processing, a pre-production test on the reaction of the zipper would be necessary in order to prevent any undesirable effect of both the zippers & garments.

Chemicals used in the garment dye may cause color change on the metal elements and result in the stain migration problem on the garment fabrics.



# Section 2: Precautions on Wash/Wet Processing <<<<<<<<<

## 2-3 Change in Metal Zipper Color by Bleaching

Strong oxidative bleaching agents such as sodium hypochlorite may be added during the garment bleaching processes. Such oxidative bleaching agent may react with the copper element of the brass zippers or the metal zipper components (e.g. slider, top stops, bottom stops or open parts) and causing the color change problem. The same phenomenon may be observed with the usage of Hydrogen Peroxide and Hydro Sulphite.

Depending on kinds of bleaching agents, temperature and duration, the degree of the color change may vary. In some cases, not only the metal parts, but also the zipper tape may be discolored.



### Suggestions

- It is recommended to sew zipper after the bleaching and the bleached fabrics should be sufficiently neutralized / rinsed after the treatments. If the zipper product is subject to bleach with the garments, a test on the reaction of the zippers under the bleaching processes would be highly recommended.
- Do not apply strong and high concentration of bleaching agents on the zipper products.
- Thoroughly and immediately rinse garments / zipper products after bleaching.

### Supplementary Information about Color Change of Copper Elements

When the copper elements of the brass zippers come into contact with various chemicals, the color of the metal may possibly change as follows:

Substance Contacted	Inorganic Compound Formed	Color Change into
Oxide	$Cu_2O$ $CuO$	Reddish Brown Black
Hydroxide	$Cu(OH)_2$	Pale Blue
Chloride	$CuCl_2$ $CuCl_2 \cdot 2H_2O$	Brown Green
Sulphate	$CuSO_4$ $CuSO_4 \cdot 5H_2O$	White Blue
Sulphide	$CuS$	Black
Nitrate	$Cu(NO_3)_2 \cdot 3H_2O$	Dark Blue
Carbonate	$CuCO_3 \cdot Cu(OH)_2$ $2CuCO_3 \cdot Cu(OH)_2$	Green Blue

## >>>>>>> Section 2: Precautions on Wash/Wet Processing

### Stain Migration of Metal Zippers by Stone / Sand Washes 2-4

In order to add used or vintage look to denim, stone or sand washes are often used, and volcanic rocks, pumice stones or sand are added to the garments during washing process. The heavy abrasion on the garments brings the expected color fading of the garment fabrics, but may also damage the zippers to a certain extent.

Those heavy washes may leave obvious scratching, scraping on the metal surfaces of the zipper components (including elements, slider, top stops or bottom stop). The degree of damages may vary depending on the size and ratio of the stones / sand, washing time and load of garment, etc. Due to the physical abrasion on the metal surfaces, metal dust may come off from the zipper components, and when it is mixed with the stone / sand powder or dirt washed off from the garments, it may be accumulated and attached on the metal surfaces of the zipper. When such stains on the zipper chain or zipper parts come in contact with the garment fabrics, it may cause stain migration. Stain may look more obvious on the lighter color garment.

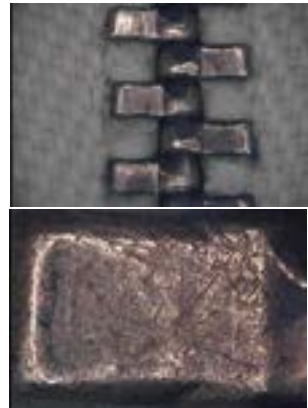
Because those stains are attached on the surface of the garment fabrics instead of resulting from chemical reaction, it can be simply removed by washing by organic solvent or detergent.

In order to prevent the undesirable stain migration on the garment fabrics, zippers should be kept away from any direct striking with hard objects (e.g. stones etc.) during the garment washes. To ensure that the zipper is closed and protected under the garment fabrics throughout the washing processes would help to minimize the stain migration problem.

Regarding the possible damages on zippers due to the harsh treatments in the stone / sand washes, the selection of YZIP® products would be recommended for their higher durability and zipper strength (See P9).



Blackish stain can be observed on the garment fabrics at where the zipper chain was probably attached or pressed on. The stain migration is particularly obvious on the light color.



The surface of the metal component e.g. elements are scratched or scraped. The scraped off metal dust may be mixed with the dirt washed off from the garment and cause the staining problem.

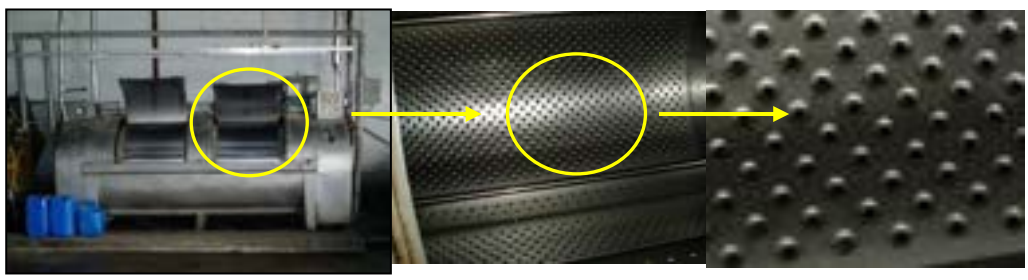
## Section 2: Precautions on Wash/Wet Processing <<<<<<<<<

### 2-5-1 Open Part Breakage

In order to add special effects to the garments, garments are sometimes subjected to post processing. Wet processing (garment wash) is one of the most popular processing techniques. During this process, while the garments are tumbled in the washing / drying machine, the zippers are repeatedly hit / rubbed against the inner wall of the machine. If zippers aren't protected properly, such small parts as retainer box or pins could get caught in the small holes of the machine, repeatedly pulled / twisted by the garments, and could end up damaged or broken.



### Washing Machine & Inner Holes



## >>>>>>> Section 2: Precautions on Wash/Wet Processing

### Open Part Breakage 2-5-2

#### Suggestions

- Please close up the zipper with the slider locked at the top end so as to avoid exposing the small parts of the open parts.
- Bigger wash amount increases load. Please minimize the wash amount / garment pieces.



**Close up the zipper and lock the slider at the top end.**



**Wrap the slider with cloth and sew onto the tape / garment.**



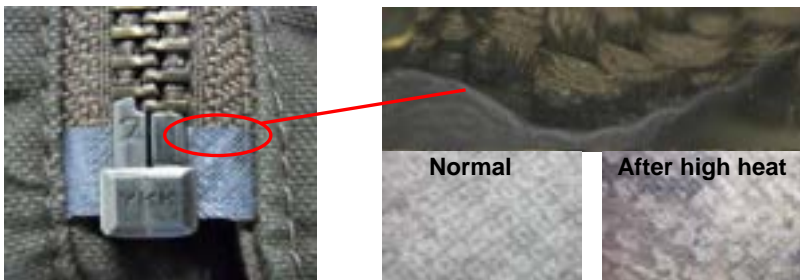
## Section 2: Precautions on Wash/Wet Processing <<<<<<<<<

### 2-6 Whitening of Transparent Film

Transparent film is attached at the top & bottom ends of the open-end zipper tape. Although zipper tape is woven and finished to prevent fraying during normal use, for open-end zippers, tape ends (especially bottom) are always exposed and touched during use. In order to prevent fraying even after repeated use, this film is attached.

#### Film Whitening Problem

The film is adhered onto the tape by melting the adhesives on the film by heat. Due to its material properties, the adhesive can melt again under high heat. During the garment washing, garments are tumbled and squeezed in the machine and the filmed tape ends also get squeezed / twisted. The film's adhesion onto the tape is thus weakened, and if these weakened tape ends are subjected to heat (e.g. drying or ironing), the adhesive can melt, and the film could be peeled off the tape and hardened, exhibiting whitish color.



#### Suggestions

- Zipper should be opened before processing in order to avoid twisting force gathering at the tape ends. Tying up 2 side stringers and wrapping up both side ends (as shown in the pictures) would further prevent elements and/or open parts from getting damaged from the washing.
- Washing / drying temperature of lower than 60 °C is recommended.



Open up the zipper to prevent twist force gathering at tape ends.

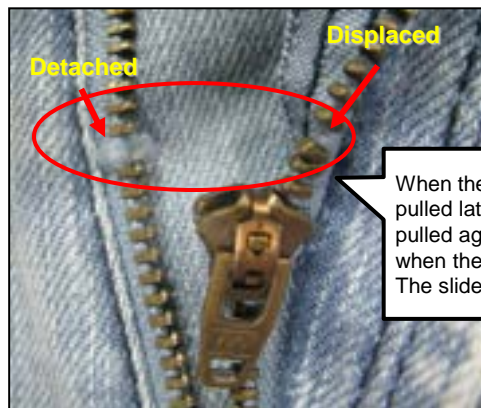


Wrap up both side ends to prevent open part damage.

## >>>>>>> Section 2: Precautions on Wash/Wet Processing

### Element Breakage 2-7

Similar to open parts, zipper elements could also be damaged / detached at wet processing, as the zipper is forcefully opened / pulled inside the wash machine.



When the zipper, incompletely closed before washing, was pulled laterally during wash, elements inside the slider were pulled against the slider wall and finally got displaced / detached when the pulling force exceeded their attachment strength. The slider also came off where the element was detached.

In addition, such hard objects as pumice stones are commonly used in wet processing to give the fabric faded / worn appearance. These hard objects could scratch off the surface of zipper components, sometimes even to expose the inner substrate.



#### Suggestions

- Please completely close up the zipper with the slider locked at the top end before wet processing (see 2-5 Open Part Breakage).
- It is suggested to wrap the zipper if such hard objects as pumice stones are used in wash.

## Section 2: Precautions on Wash/Wet Processing <<<<<<<<<

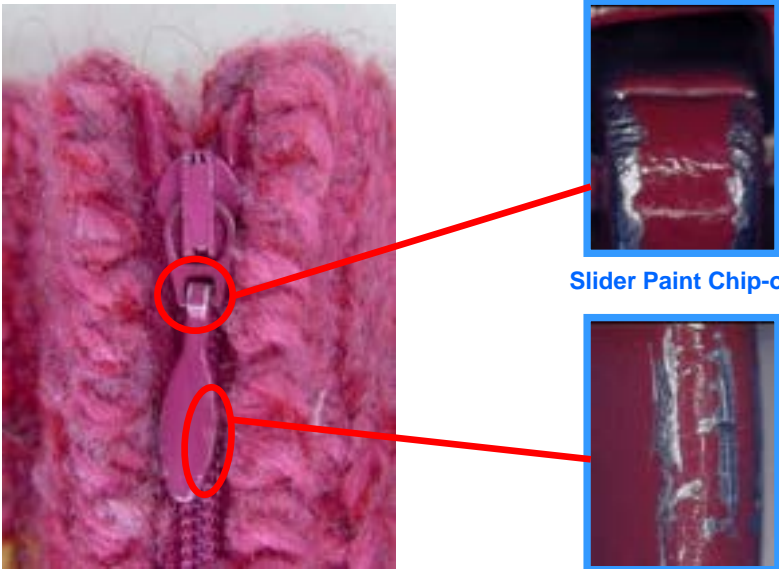
### 2-8 Slider Paint Chip Off

When a painted slider is subject to dry cleaning or wet processing treatment, including washing treatment but not limited to, the paint may chip off. This is mainly because the surface of the painted slider is being damaged when it hits a tumbler during the processing.

Normally, paint chip off can be found at the protruded part and the edges of the slider. However, the degree of chip off may vary depending on the conditions of the treatment.

Since the painting is a layer of coating, it has the limitation in durability against physical striking. Therefore, painted components of zippers should be avoided from the improper treatment, such as direct striking, scratching or wearing against hard objects etc.

Whenever the paint chip-off problem is in great concern, the selection of the plated sliders would highly be recommended. However, please kindly note that among the plated components, X6 (Black Oxides) and V7 (Matte Black Silver) finishing are comparatively weaker to abrasion or wearing and may possibly exhibit the chip-off problem under direct striking or scraping.



## >>>>>>> Section 2: Precautions on Wash/Wet Processing

### Caution of Cotton Tape Zippers 2-9

For the cotton tape zippers, yarns of the zipper tape are made from 100% natural cotton. Therefore the products may not possibly withstand or resist the harsh and unsteady chemical treatment such as strong bleaching or garment dye processing in which different chemicals would be used. To avoid any undesirable damages or effects on the cotton tape zippers, please be aware of the characteristics of the cotton material and pay particular attention to the following aspects.

- **Zipper tape strength** - The use of strong acids or chemicals, such as hydrogen peroxide or sodium hypochlorite, for such treatment as garment bleaching, washing and/or dyeing, can weaken cotton fabrics and cause damage to zipper tape.
- **Shrinkage** - In comparison with polyester, cotton is known to be subject to greater shrinkage when processed. This may result in puckering, especially when the match between the zipper tape and the garment fabric is not sufficient.

#### <Information for Reference>

Under JIS L1096 Laundering Test, the shrinkage of cotton tape products is approx. 6.5%, while that of the polyester tape products is approx. 2.0%. (Testing conditions: Washing at 60 °C for 30 mins.; Rinse twice at 38-40 °C for 2 mins.; Drying at 60 °C for 30 mins.)

Note: The shrinkage rate of the zippers may vary depending on the processing conditions such as temperature, duration and applications of chemicals...etc.

Customers are advised to conduct the pre-production test to avoid any undesirable shrinkage problems occur after the treatments.

- **Color fastness performance** - The color fastness of cotton tape is often weaker than that of polyester zipper tape. Discoloration or stain migration may occur when cotton tape is subjected to any dyeing process;
- **Color change of metal components** - When cotton tape products on a garment are subject to any dyeing process, there is a high probability that metal components of the zipper would be subject to color changes and unexpected effects arising from any of a number of chemical reactions;
- **Zipper strength** - Chain strength performance of cotton tape products is weaker than that of polyester tape products.

Considering that different treatment conditions may affect the performance of the cotton tape zipper products at different extent and all the possible factors cannot be listed out in details, test on the garment sample with the specific treatments before placing the bulk order is highly recommended.

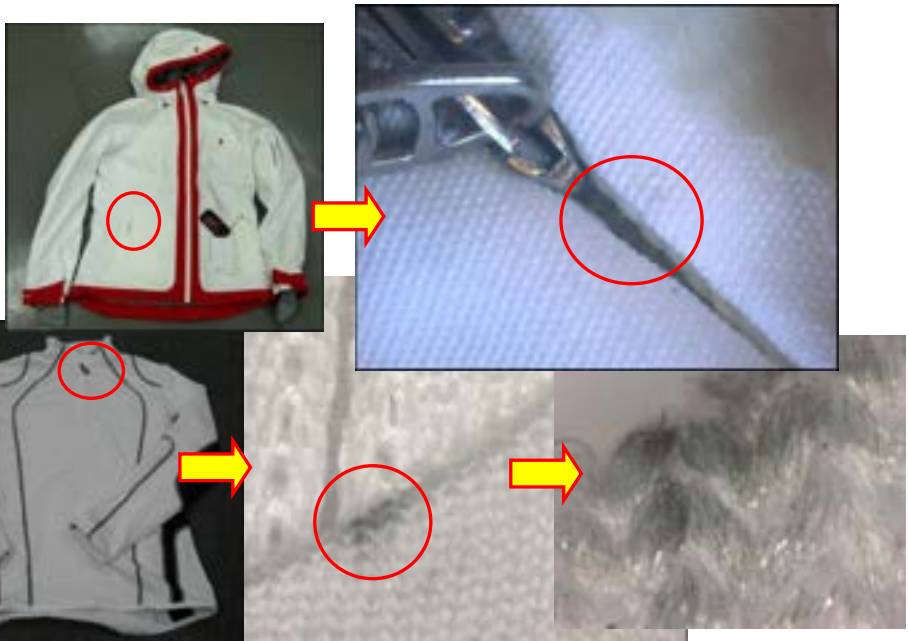


## Section 2: Precautions on Wash/Wet Processing <<<<<<<<<

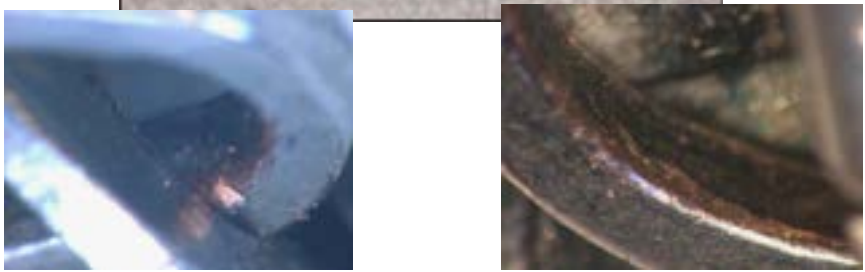
### 2-10-1 Staining onto Fabric

Garment fabric, especially of light colors, could be stained by sliders after washing or daily use. This problem is more frequently reported with sliders having a clamper. Sliders with a clamper have more free movement of the pull, and during this movement the pull metal surface is rubbed against the connecting parts and some particles could chip off.

This chipped-off particles can adhere the adjacent fabric and cause a stain. This stain, however, can be removed and cleaned by general detergents.

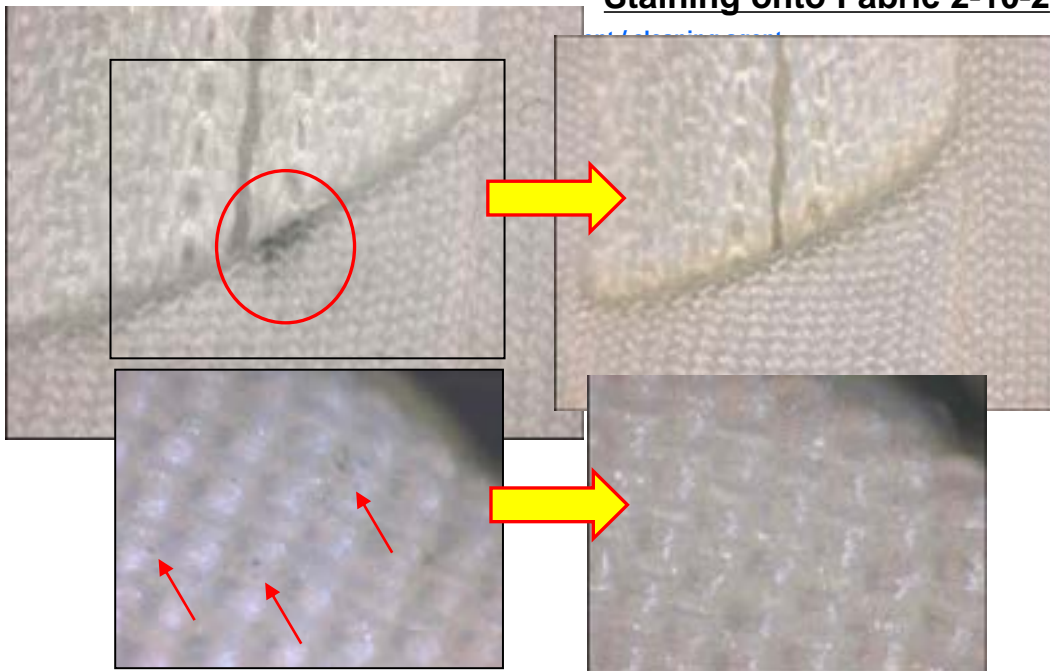


Magnification of a clamper --- surface is scratched and some parts are chipped off.



## >>>>>>> Section 2: Precautions on Wash/Wet Processing

### Staining onto Fabric 2-10-2



#### Suggestions

- Fixing the slider puller before garment washing to limit the puller movement is recommended.
- The garment fabric away from contact with the slider is also suggested.



Slider puller is fixed with sewing thread.



The garment fabric is sewn down to keep away from contact with the slider.

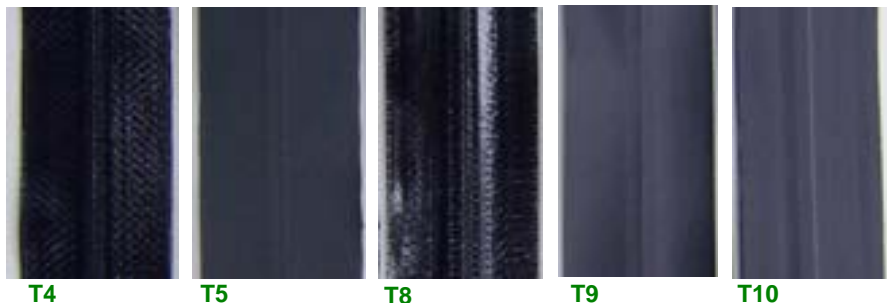
## Section 3: Precautions on Zipper Use <<<<<<<<

### 3-1-1 Proper Usage of AquaGuard® (Water Repellent) Zippers

In order to make sure the AquaGuard® zipper works properly and to avoid any undesirable problems of the garment products, please observe below precautions:

- AquaGuard® is a water repellent zipper, not waterproof or water tight. In other word, water may leak through the slit of the zipper chain.
- AquaGuard® zipper must be closed completely when washing and let it dry naturally after washing in order to avoid damage to the laminated film on the zipper. Any damages on the laminated film may result in deterioration of water repellency.
- Petroleum-based dry cleaning solvent is recommended. Chlorine-based dry cleaning solvent may cause difficulty in operating zipper, cloudy appearance of the laminated film, and/or color runs.
- Do not iron. High temperature (over 150 °C) on the zipper may cause melting / protrusion (bubbles) of the laminated film.
- Keep away from direct sunlight when not wearing. It may cause zipper to turn yellowish especially if zipper is pastel color.
- Prolonged contact with PVC and/or polyurethane may cause color runs.
- Frequent and repeated folding (bending) of the zipper may cause cloudy appearance of the laminated film. However, it will not affect the water repellency.
- Due to the nature of film lamination processing, zipper color may vary slightly from the color shown on the "YKK Standard Color Card".

#### Types of Water Repellent Zipper



T4

T5

T8

T9

T10

## >>>>>>> Section 3: Precautions on Zipper Use

### Proper Usage of AquaGuard® (Water Repellent) Zippers 3-1-2

In response to the diversification of the garment style, thermal welding of zippers instead of sewing is widely applied in the garment making, especially to attach water repellent zippers onto the garment. Here, however, welding at high temperature over **150 °C** may cause color migration from the zipper tape and staining onto the fabric. This problem could be more apparent and serious when the zipper color is in contrast to the fabric color. Therefore, it is strongly suggested to keep the temperature **lower than 140 °C** at thermal welding.



It is also recommended to place a sheet of paper / lining between the zipper and the fabric underneath during welding in order to prevent staining.

As not only temperature but also such factors as welding pressure, time etc. could affect the possibility of staining, please conduct a preliminary test with a small sample batch before beginning bulk processing.

In addition, the laminate film of AquaGuard® zipper gets heated by the welding and softened. Slider movement in this condition could damage the film edge.

**Damaged Film Edge**



**Film Edge  
Torn & Damaged**



**DO NOT move the slider  
until the heated chain has completely cooled down.**

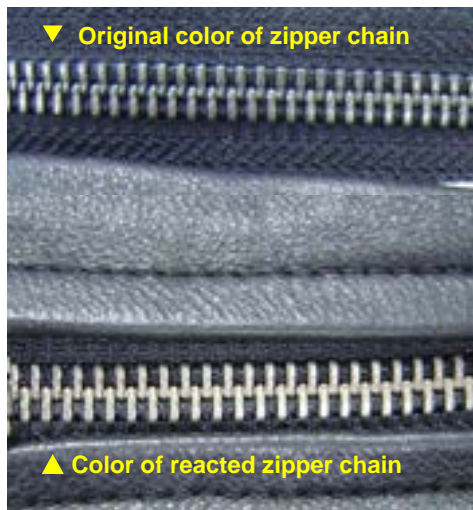


## Section 3: Precautions on Zipper Use <<<<<<<<

### 3-2 Change In Metal Zipper Color by Leather Products

During the leather tanning process, tanning agents such as sulphuric acid, mineral acids, chrome compounds, tannic acid and aldehyde compounds are commonly used. When those tanning chemicals on the leather products come in contact with the metal zippers (or the metal components of the zipper), metal color may change.

Such color change may be accelerated if the products are placed under the air-tight (or poor ventilation) and high temperature environment, or being stored under pressure.



Metal zipper teeth turned yellowish after contact with remained chemicals of leather products



Oxidized metal zipper teeth due to reaction with leather products

#### Suggestions

- Use the leather which has been sufficiently washed and neutralized after the tanning processes;
- Avoid keeping the metal zippers with the leather products under the air-tight package or in poor ventilation environment;
- Avoid the prolonged contact or pressing the leather against metal zippers.

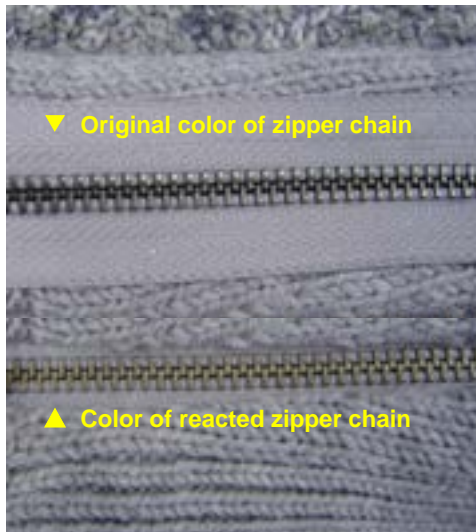
## >>>>>>> Section 3: Precautions on Zipper Use

### Change In Metal Zipper Color by Wool Products 3-3

When metal zippers are attached to bleached wool knit products, a color change of metal may take place. Generally wool products are bleached by the following methods:

- oxidizing bleach (e.g. hydrogen peroxide)
- reducing bleach (e.g. hydrosulphite)

Furthermore, some wool products are treated with chlorine oxidizers for a shrink-resistant finish. If sufficient washing or neutralization has not been made after treatment, especially with hydro-sulfite or chlorinating agents, gas (e.g. chlorine gas or sulfur dioxide gas) may be generated. These agents may also react directly on metal in humid conditions. For example, if wool products are put into bags immediately after pressing and kept as they are, various chemicals and gases may cause a color change on the metal parts of copper alloy zippers.



Oxidized metal zipper teeth due to sulfuric acid remained on the wool garment fabrics.



Color change of metal zipper teeth

#### Suggestions

- Use completely washed and dried wool cloth.
- Take sufficient time before wrapping after the products are pressed.

## Section 3: Precautions on Zipper Use <<<<<<<<<

### 3-4 Cautions for Aluminum Alloy Zippers

Aluminum zippers are used in some markets because of the competitive price, but it has some disadvantages due to its nature. Please observe below precautions for proper use of the aluminum zipper.

#### ■ Nature of Aluminum Zippers

Aluminum is easily affected by moisture, temperature and humidity, and vulnerable to shock, friction, acidic or alkaline element. Therefore, aluminum zippers are not suitable for harsh treatment such as jeans washing or over-dyeing.

#### ■ Melt of Elements

Jackets and pants are frequently subject to washing at their finishing process. Aluminum is weak to alkali and it is reported that strong alkaline solvents may melt the elements of aluminum zipper. Please pay attention when chemicals as metasilicic acid soda are used. Also make sure to rinse out those chemicals thoroughly and immediately.

#### ■ Migration and Staining from Aluminum Zippers

Since aluminum is vulnerable to friction, tiny metal dust is scraped off when operating zippers, which may cause the stain on the garment. When this metal dust comes together with paraffin wax (which is necessary for smooth zipper operation), it may leave darker stains. Please pay extra attention when applying aluminum zippers to the light-colored garments.

\* The stain can be removed to some extent by rinsing with any general detergents.



Stain by Aluminum (1 yen coin)

#### ■ Elements Worn-Out

The aluminum zipper is vulnerable to friction so its elements may be worn out during the operation of the zipper with zinc-alloy sliders with lock such as DA/DP type. These zippers cannot be used with a copper-alloy slider such as GA/GS type because the slider is hard, and it may damage the zipper elements significantly.

It is recommended to use the item "YAN", which is an alumite-finished aluminum zipper with improved durability. However, we suggest testing before the actual application of those products.



Normal Elements



Melted Elements



## >>>>>>> Section 3: Precautions on Zipper Use

### Checking Slider Locking Function 3-5

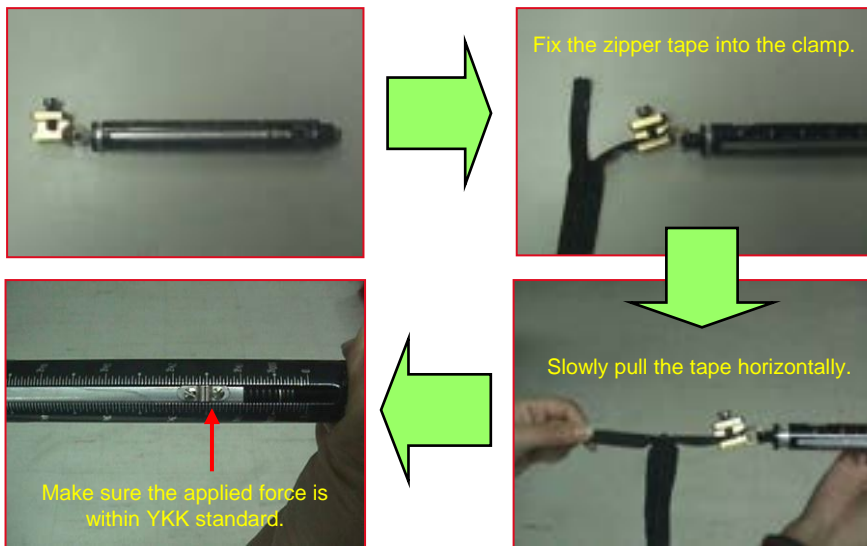
The Slider's locking function is one of the most important properties of zippers and sometimes it is checked before zippers are sewn. However, sometimes excessive force is applied in this manual check and this may damage the locking mechanism, especially of the small size coil zippers, and consequently the lock function could be disabled.

In order to prevent unnecessary damage to zippers, please refer to the following proper checking method:

**Tool to be used:** Spring Scale with Clamping Device

**Steps:**

- 1: Open a zipper about 4 cm.
  - 2: Fix the right zipper stringer into the clamp.
  - 3: Holding one tape with one hand and the scale with the other hand, slowly separate the tapes until the force indicated in the scale reaches YKK standard.
- \* YKK standard can be obtained from YKK sales representatives.



**Evaluation:**

Slider slides down at force lower than YKK Standard: Defective

Slider stays at position at force up to YKK Standard: Conformable

\* If the product is found defective, please immediately contact us with tested & non-tested samples.

## Section 4: Precautions on Zipper Sewing <<<<<<<<

### 4-1 Proper Sewing of Coil Zippers

During the spacing process of the coil zipper production, elements are cut and removed from the zipper tape. Occasionally a half element (remained after cutting) may be left behind next to the top stops of the zipper and such cut element may be juttred if the top extension of the zipper tape is bent closely to the top stops during the garment sewing processes. The sharp cut end of the juttred element may hurt a user / consumer.

#### Suggestions

- The top extension(s) of the zipper tape should be bent at least 5mm apart from the first element (at the top stop position). This would prevent the jutting of the cut elements.
- The selection of the P-TOP (plastic top stops) products can prevent the exposure of sharp cut element, and is highly recommended for infants / kids' garments.

**P-TOP  
(Plastic Top Stop)**



**Metal Top Stop**



**Keep at Least  
5 mm of Space**



## >>>>>>> Section 4: Precautions on Zipper Sewing

### Proper Use / Sewing of 3CF Open-End Zippers 4-2

3CF open-end & two-way open zippers are designed for thin and light fabric. To ensure light weight, open parts of this product are made of plastic. Therefore, their strength is relatively low (about half of 5CN, which is generally used in the front opening of general garments).

Therefore, please avoid using this product in heavy knit garments, with thick fabric, or where a strong force may be applied during garment use. Strong pulling or twisting could result in the breakage of the parts.



**DO NOT twist the open parts.**

Also please note the following precautions for proper handling in order to avoid unnecessary damage or breakage.

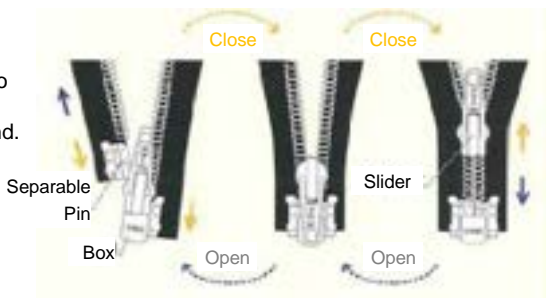
#### Zipper Operation:

##### When Closing:

1. Make sure the slider is positioned next to the box.
2. Completely insert the pin into the box end.
3. Pull up the slider.

##### When Opening:

1. Pull the slider closely to the open parts.
2. Draw the separable pin out.



#### Ironing:

1. Please completely close the zipper and cover with a piece of cloth.
2. Ironing temperature should be lower than **130 °C**.
3. Please be careful not to accidentally iron the plastic parts.

#### Sewing:

Please sew outside the yellow line.

**DO NOT** sew on the plastic part.

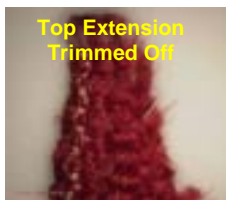
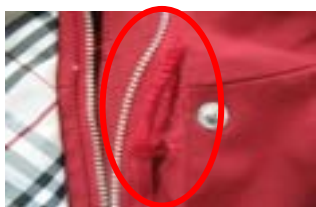
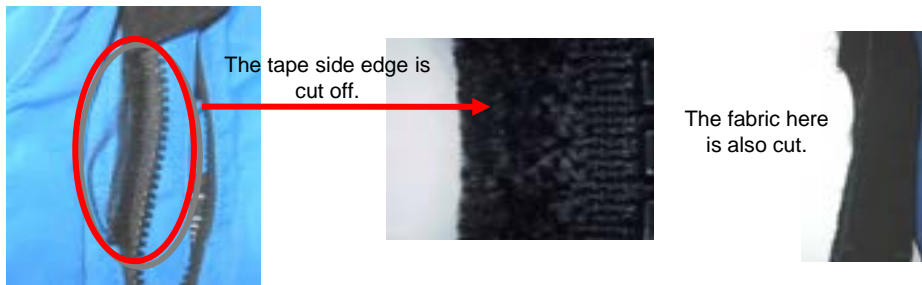
**Sew outside Yellow Line**



## Section 4: Precautions on Zipper Sewing <<<<<<<<

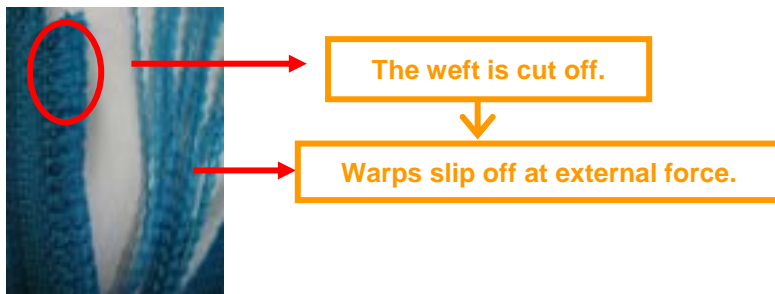
### 4-3 Zipper Tape Breakage by Trimming

Some tape tear problems reported have been found to have been caused by trimming of the tape end/edge when the zippers are sewn onto the garment.



#### Precaution on Sewing:

Zipper tape is woven in a certain pattern to secure the construction of the entire tape. When the weft of the tape is cut off, the warp can slip from the structure and result in wide tearing when the tape receives some external force.



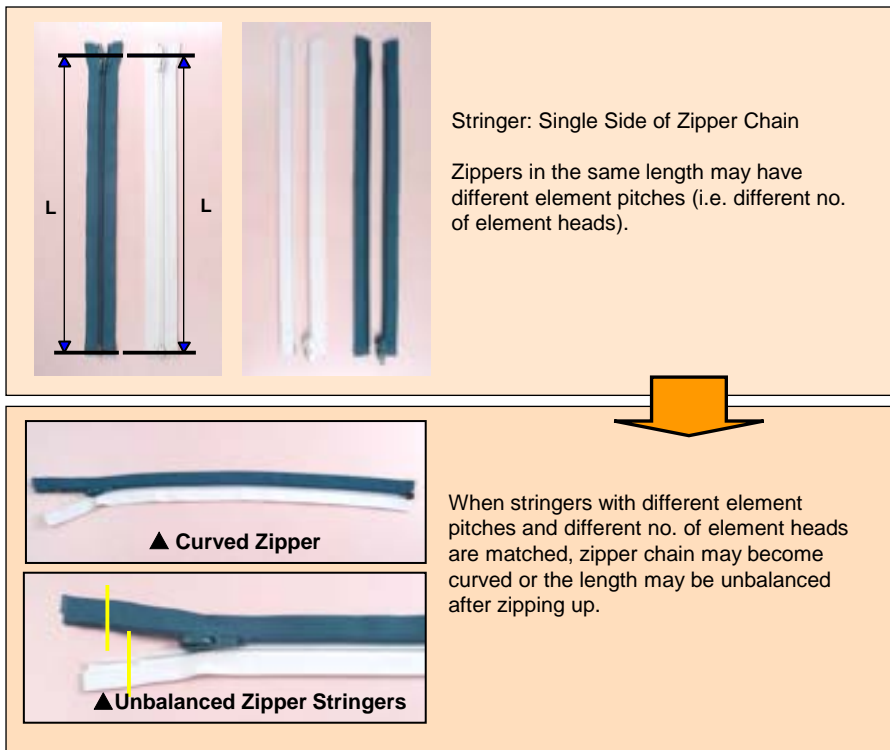
Please **DO NOT** trim off any part of the zipper tape so as to prevent any unnecessary tape breakage.

## >>>>>>> Section 4: Precautions on Zipper Sewing

### Problem of Pairing up Different Stringers 4-4

Garment manufacturers may separate an open-end zipper in order to have an easier garment sewing process. Therefore many zippers are being separated at the same time and paired up again without matching the original set of zipper chain during sewing, which may cause the unbalanced zipper length between the left and right stringers when the zipper is closed.

Risk of having such problem is high for coil zippers because their chains are generally more elastic/ stretchy in nature, the original length of the chain may be stretched out when tensions is applied on it. Different tensions applied on the zipper chains may cause deviations in the element pitches (i.e. having different number of element heads) and the matching stringers with different element pitches would lead to the unbalance zipper chain - either having a curved zipper chain or unbalanced stringer length.

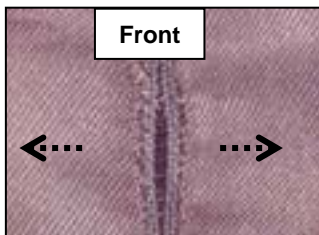
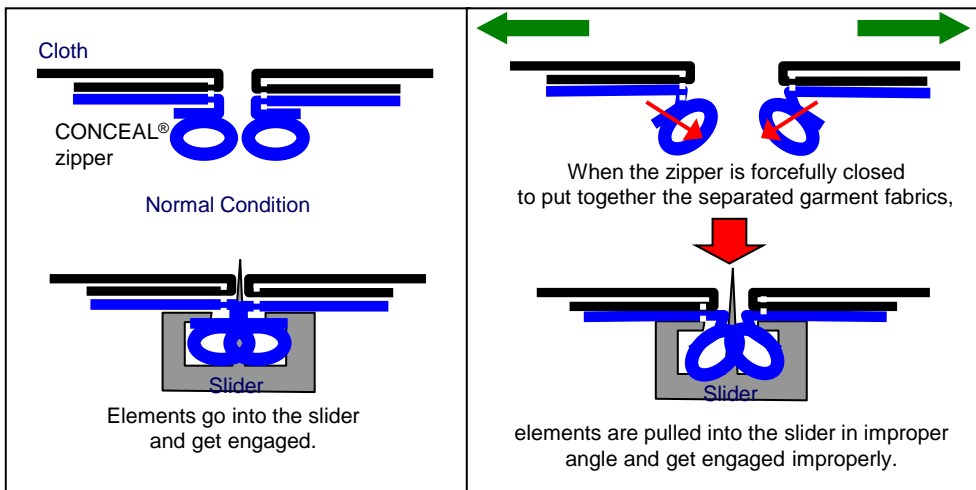




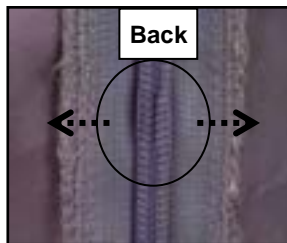
## Section 4: Precautions on Zipper Sewing <<<<<<<<

### 4-5-1 Proper Use / Sewing of 2CH CONCEAL® Zipper

The CONCEAL® zipper may be used for tight-fitting clothes such as a dress. Zippers are usually closed with both stringers pulled closely, elements going into the slider and engaging with the other counterpart. For tight-fitting clothes, especially at such tighter part as waist, pulling both stringers closely to close the zipper may be hard and sometimes slider is passed forcefully although the stringers aren't pulled in position. In this situation, elements may go into the slider in an improper angle, and consequently get engaged with less area. This improperly engaged chain could easily burst at little force.



The elements received crosswise force and burst.



The elements are deformed.

#### Suggestions

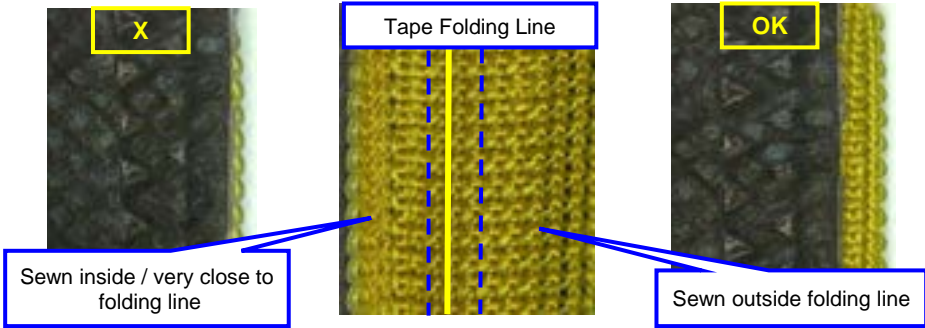
- Please make sure to pull closely together both side garments before zipping up the garment.
- Attaching hook & eye fastener at the top stops could reduce load against closed zipper chain.

## >>>>>>> Section 4: Precautions on Zipper Sewing

### Proper Use / Sewing of 2CH CONCEAL® Zipper 4-5-2

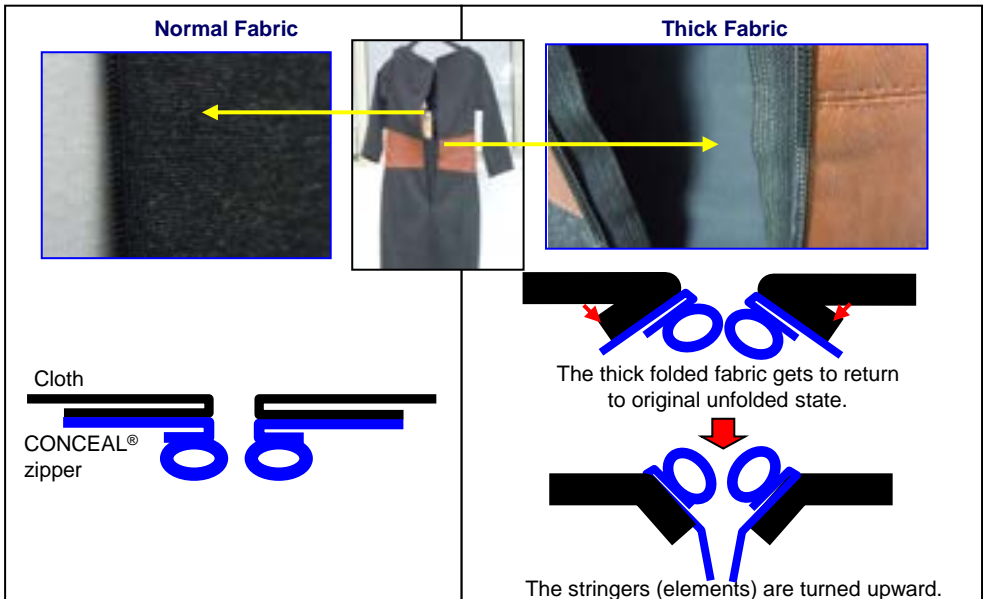
CONCEAL® zipper is often sewn to the garment fabric at the line very close to, or even inside the folding line of the zipper tape, in order to better hide the zipper.

This sewing style could easily cause chain burst problem at garment use.



In addition, when it is sewn on thick fabric or at fabric joint part, zipper stringer / elements could get turned up due to the nature of thick / folded fabric as shown in below diagram.

In this situation, it is harder to make sure the elements are aligned properly before entering the slider, therefore, slider movement could become harder. Forced pulling of the slider in this condition could easily cause mis-engagement of the elements and result in the chain bursting.

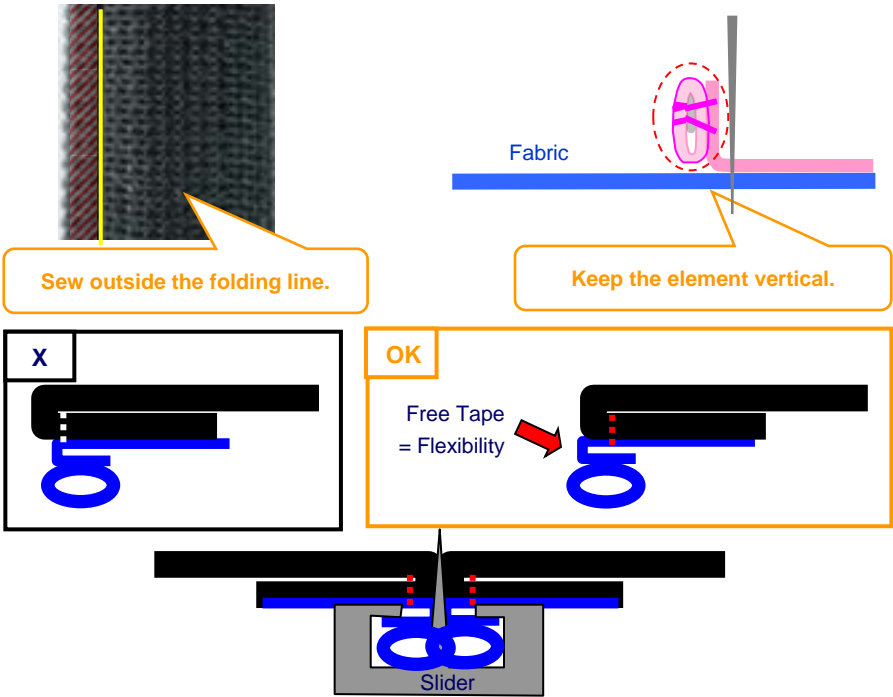


## Section 4: Precautions on Zipper Sewing <<<<<<<<

### 4-5-3 Proper Use / Sewing of 2CH CONCEAL® Zipper

#### Suggestions

When sewing CONCEAL® zipper onto fabric, please sew outside the tape folding line keeping the element vertical, in order to give enough flexibility to zipper tape.



Using YKK's special presser foot for CONCEAL® zipper is strongly recommended as it can easily guide the needle to the proper sewing position.



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All the instructions & precautions on YKK products are also available at our websites below.

**<http://www.ykkfastening.com/>**

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