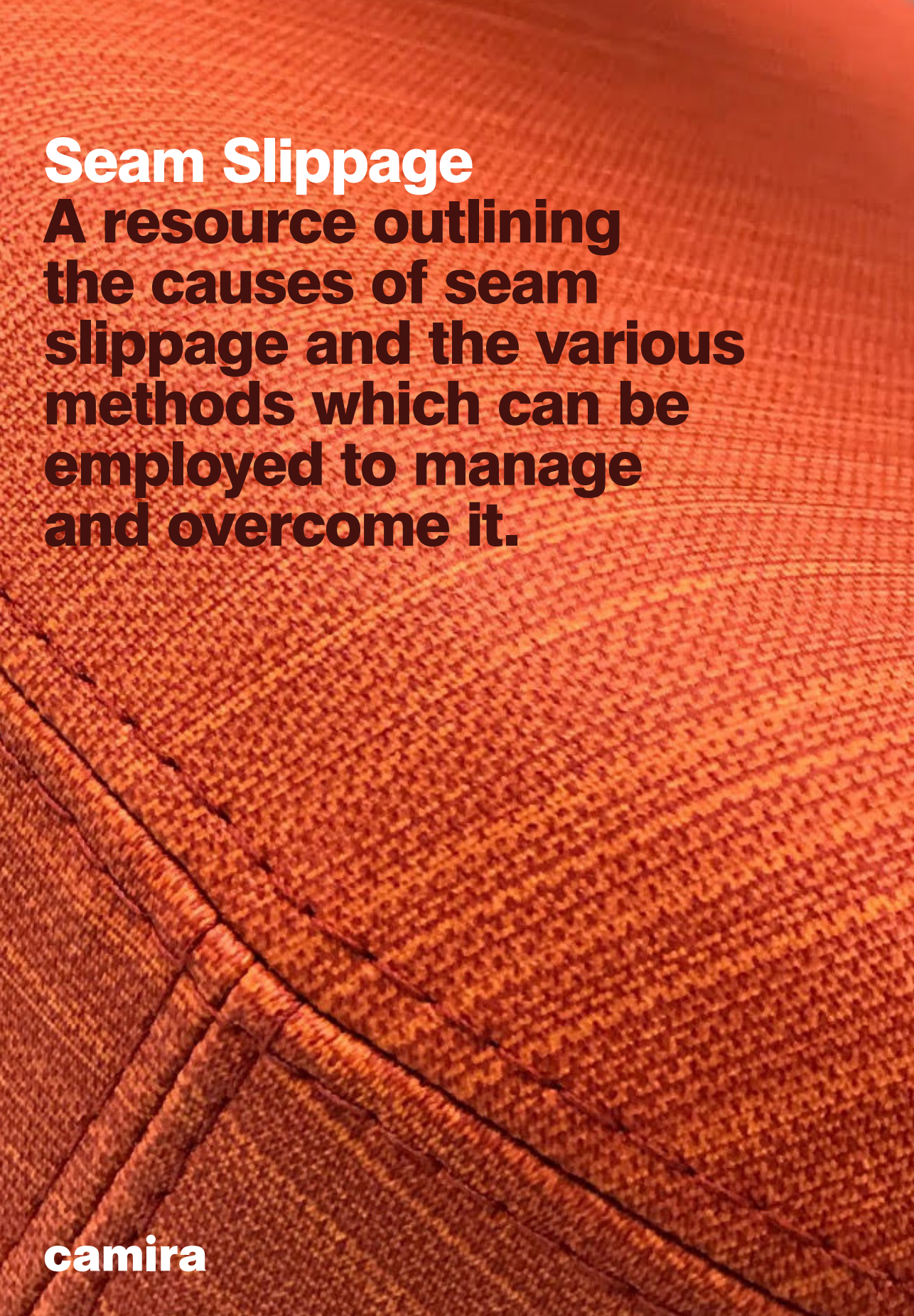


# Seam Slippage

## A resource outlining the causes of seam slippage and the various methods which can be employed to manage and overcome it.

camira

# What is seam slippage?

Seam slippage is defined as the open seam created when a fabric lacks the tensile strength to prevent fraying at the seams. When force is applied to the fabric, the yarns separate or 'slip' in the woven construction, causing the seam to 'grin' - this can ultimately lead to an opening of the seam.

# What causes seam slippage?

A woven fabric's propensity for seam slippage is dependent on the amount of yarn-to-yarn friction present in the finished fabric construction. Where there is a low level of yarn-to-yarn friction, the fabric is more likely to be affected by seam slippage.

Low yarn-to-yarn friction can arise for a number of reasons:

**Weave**

Some fabric constructions have fewer warp and weft interlacings - this reduces the yarn contact points and, consequently, yarn-to-yarn friction.

**Fabric density**

A relatively open fabric construction allows the yarns easy freedom of movement.

**Type of fibre/yarn**

A smooth yarn will move more readily over other adjacent yarns, increasing seam slippage. Coarse yarns will have a lower number of ends and picks per inch, making seam slippage more likely if narrow seam allowances are used in construction.

**Finish**

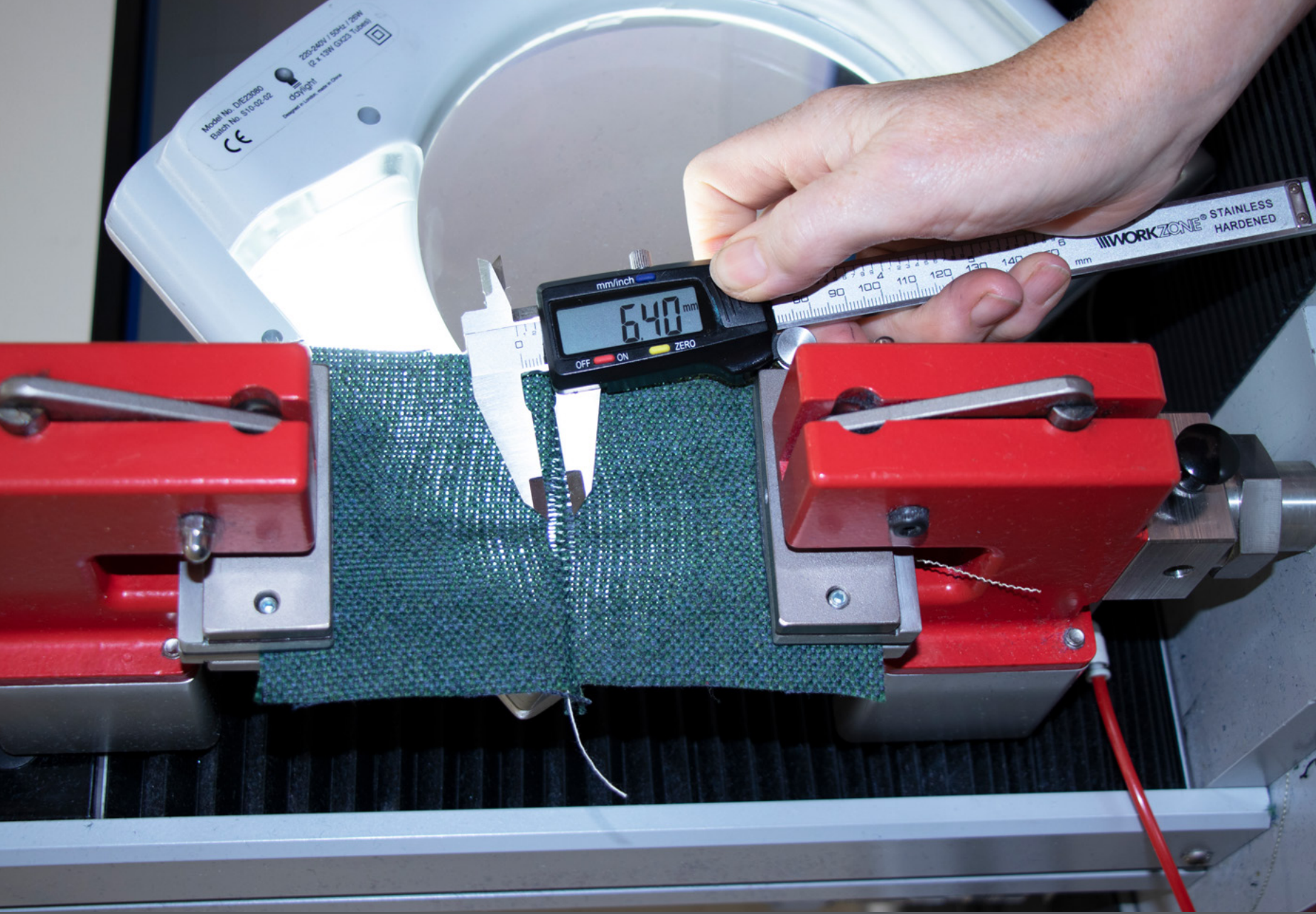
The type of fabric finish employed may reduce yarn-to-yarn friction. For example, a softener applied to the fabric may lubricate the yarns within the fabric, allowing them to move more freely.

**It is important to note that seam slippage is a characteristic of a fabric based on its construction, the yarns used, and the finish employed, and is not a fault in or with the product.**

# How is seam slippage tested?

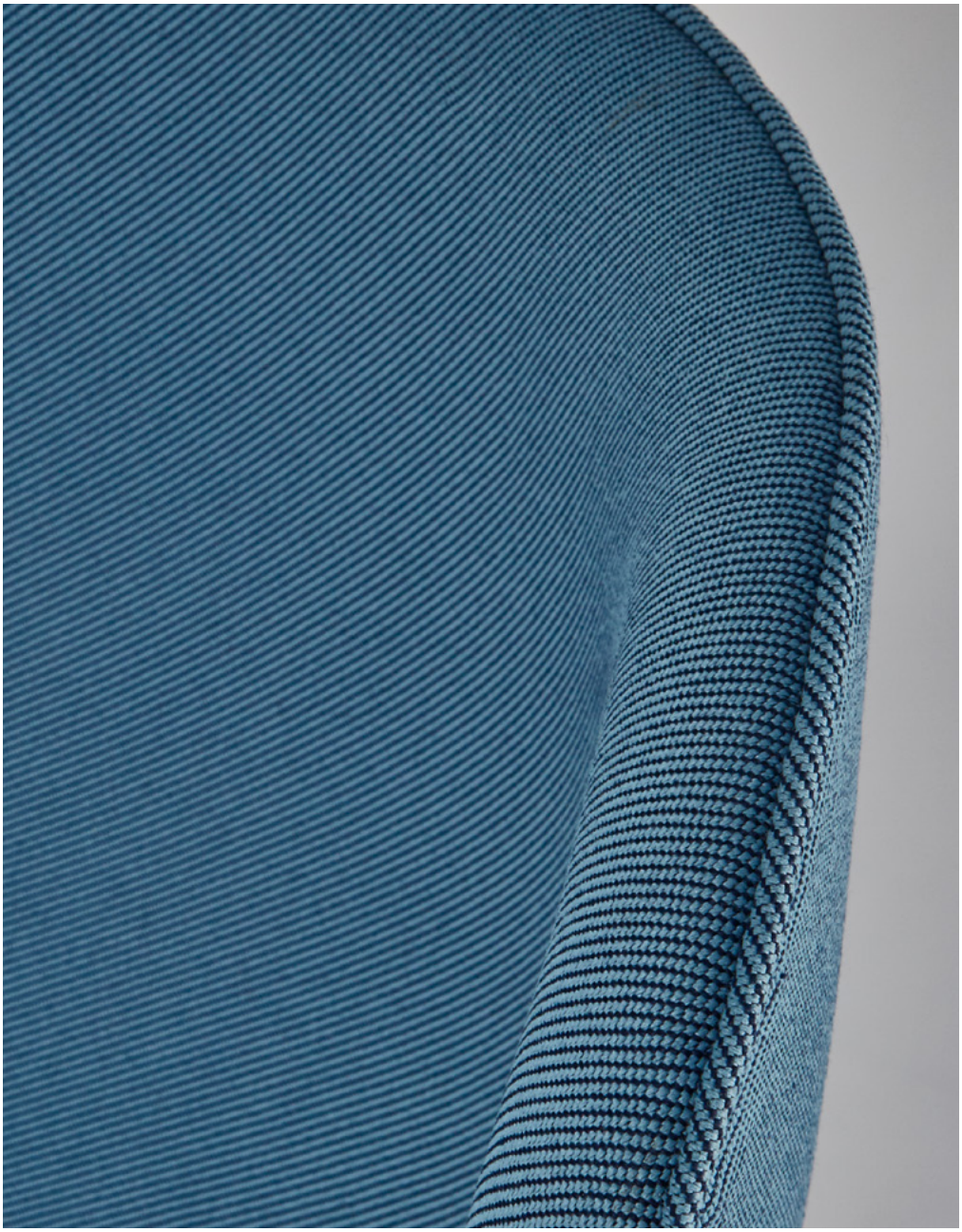
Each Camira fabric is tested internally to BS EN ISO 13936-2:2004 - a standard which determines the slippage resistance of yarns at a seam in woven fabrics.

The test involves folding a strip of fabric and stitching across its width, the strip is then cut near the fold and a force is applied to the strip at right angles to the seam using grab-test jaws. The extent to which the seam opens is measured and reported to the nearest millimetre. If the seam breaks entirely during testing, it is considered void.


mm/inch
6.40 mm
OFF ON ZERO
WORKZONE® STAINLESS HARDENED

# Test Methods and Standards

There are many different methods that can be utilised to establish seam strength within upholstered furniture. Internally Camira test in accordance with European BS EN ISO 13936-2:2004 defined as the determination of the slippage resistance of yarns at a seam in woven fabrics using the fixed load method. Alternative methods include ISO 13936-1:2004 (Fixed seam opening method), the American ATSM D 4034 – 92, Resistance to yarn slippage at the sewn seam in woven upholstery fabrics, or alternatively, ASTM 4033 – 92 (Dynamic fatigue method).



Testing in accordance with European BS EN ISO 13936-2:2004 involves cutting a fabric using a template of a specified length and width (20cm x 10cm respectfully), folding and stitching it in the specified position, and then conditioning it in standard testing atmosphere (65 ± 4 Relative Humidity and temperature of 20 ± 2°C) for a minimum of 24hrs prior to testing. The fabric samples should contain 32 ± 2 lock stitches in 10 cm and the tension on the sewing machine adjusted so that the interlacing of the top and bottom threads is between the surfaces of the fabric being sewn. The sample is then cut at a specific distance from the fold and a force applied at 90° to the seam using grab test jaws using a Testometric-AX. The opening at the seam is then measured using calibrated callipers.

During testing, the clamps should be set at a distance of 100 ± 1mm apart and set the constant rate of jaw separation at 50 ± 5 mm/min. The sample should be clamped symmetrically in the jaws, ensuring that the seam is midway between and parallel to the jaws and the cut fold should face towards the back. The sample is then extended until a force of 180 N has been reached and will then relax until to a force of approximately 5 N is reached. When the fabric has relaxed, a measurement should be immediately taken using calibrated callipers at the seam opening. The measurement should be taken at the widest part of the seam opening e.g. between the top line of holes to the bottom line of holes. The final results are obtained by calculating the arithmetic mean of all five warp and/or weft measurements, and then reported to the nearest millimetre. If the seam breaks entirely during testing, then the test counts as void.

The ASTM D 4034 – 92 follows a similar testing mechanism. Two pieces of fabric, one 4 x 4" (100 x 100 mm) and one 4 x 10" (100 x 250 mm) are cut from both the warp and weft (fill) directions. The 4 x 4" sample is placed on top of the 4 x 10" sample, face to face, ensuring the edges are evenly lined up. A seam is then stitched across the short dimension of the specimen, 0.5" (12 mm) from the edge of the specimen, using a plain lockstitch 7 ± 0.5 stitches per 1 inch (25 mm). The plain lockstitch shall conform to Type No. 301 of Federal Standard No. 751a. For preliminary testing, two specimens are required, one with the long dimension parallel to the warp and one with the long dimension parallel to the fill. Preliminary testing is not required if the direction with the lower resistance to yarn slippage is known. For final testing, five specimens in the direction of the greatest slippage are required.

During testing, the clamps should be set at a distance of 3 inches (76 mm) apart and set the constant rate of jaw separation at 12.0 ± 0.5 in./min (5.0 ± 0.2mm/s). The sample should be clamped symmetrically in the jaws, ensuring that the seam is midway between and parallel to the jaws and the cut fold should face towards the back. First the 'fabric only' sample is tested followed by the 'seamed fabric'. Resistance to yarn slippage is determined as the pounds force [or Newtons] required to produce a separation of ¼ inch (6.3 mm). Results are classified within the following types of failure;

1. Seam broke before ¼" slippage
2. ¼" slippage occurred (slippage of yarns within seam is visible)
3. Fabric broke before ¼" slippage (Fabric breakage is visible)

The final result from testing is obtained by calculating the arithmetic mean of the worst performing direction of each of the five warp or weft (fill) measurements.

# How can seam slippage be minimised?

There are numerous measures which can be taken to minimise a fabric's propensity to seam slippage, and the impact it has on the finished product. These include:

### Using a wider seam margin

This is particularly important when working with fabrics made from coarse yarns or slippery filament yarns. For example, if a current seam margin is ¼", this can be amended to ½", which will put the sewn seam behind more end/picks, creating a greater combined friction, and consequent resistance to slipping.

### Using a different seam stitch

If the seam is currently being sewn with a single needle lockstitch machine, it can be amended to:

- A four thread overedge seam. Stitch type 514 two needle four thread overedge full cover seam will give a more secure seam with better resistance to slipping.
- For an overedge seam requiring even greater seam security, type 516 five thread full safety stitch combines a stitch type 401 chainstitch with a 504 three thread overedge. The 401 element bears the tensile load while the 504 element covers the edge of the material to bind more yarns together providing additional seam security.
- If the seam is currently a superimposed seam, with one ply on top of the other with specific margin, this can be changed to:
    - A LSq seam, in which an additional row of stitch is used to cord or topstitch the seam
    - An SSae French felled seam

### Experimenting with the number of stitches per inch [SPI], thread size, needle size and needle point profile

This can help to determine the optimum seam performance for the fabric and weave being sewn, and can be done in the following ways:

- Experiment with increasing a 10spi stitch density seam to for example 12 or 14 spi
- Conversely, don't always assume a higher SPI will be better. If using an 18 spi seam, experiment with decreasing to for example 14 or 12 spi.
- Using the smallest and strongest thread possible, combined with the smallest needle size possible, and consider using an FFG ball point type needle profile as this may better penetrate and/or bind the yarns together in the weave, therefore increasing the number of attachment points to reduce seam slippage.
- Ensuring the stitch is properly balanced with the minimum thread tensions.

### Using an interlining fabric or fusible tape along the seam line

This will further help to bind the yarns on the edge of the woven fabric together to support the seam and reduce slippage.

When choosing and using contract fabrics, it is important to understand how the product will be upholstered, and its end use. If a fabric is identified as having a lower resistance to seam slippage, carefully consider the way in which it will be seamed, its fitness for purpose, and the seam durability over the lifetime of the furniture.

# The Camira Position

Product integrity and robust technical governance are intrinsic to the Camira value proposition, and we objectively measure and evaluate seam slippage, taking every available step during the manufacturing process to minimise slippage in our fabrics. However, ultimately, an element of yarn slippage is an inevitable consequence of some fabric constructions and yarn combinations.

Where a fabric is selected that by its nature is more prone to fraying and seam slippage, we recommend careful consideration of the make-up and seaming techniques used and a thorough evaluation of the product to ensure you are satisfied with the strength of the seams in the finished furniture.

**For further information don’t hesitate to get in touch with your Camira contact who will be able to refer you to one of our technical experts.**

Find your contacts online at
**www.camirafabrics.com**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