



1. Safety and High Performance: The Beissel Way for Protective Sportswear

Sportswear today isn't just about looking good while hitting the gym; it's about high-stakes protection and rugged durability. Whether you are crafting shock-absorbing gear for motorcycling or moisture-wicking apparel for elite athletes, the technical demands on every stitch are incredibly high. At Beissel, we provide the precision-engineered tools required to ensure these safety-critical garments perform exactly when it matters most.

1.1 Understanding Protective Materials

The textiles used in protective gear are chosen for their stability and extreme resilience. In your production line, you will likely encounter:

- **Heavy Synthetics:** Tough fabrics like Nylon, Cordura, and Kevlar.
- **Specialty Layers:** Materials such as Neoprene, composite fabrics, and climate membranes.
- **Armor Elements:** Integrated synthetic, carbon, or titanium shells and shock-absorbing PU or gel pads.

2. Technical Machine Parameters

For quality seams, your machinery and settings must be perfectly synchronized with these robust materials.

2.1 Sewing Machine and Feed Systems

Depending on the specific protective function, several industrial machine types are required:

- **Flatbed & Long-Arm Machines:** These are best for two-dimensional, straight sewing like long closing seams on medium-weight materials.
- **Postbed & Free-Arm Machines:** Ideal for three-dimensional parts, tight curves, and tubular sections.
- **Feed Combinations:** Compound feed with alternating presser feet is recommended for medium materials, while roller feed systems are best for joining seams on three-dimensional parts to ensure visibility and precision.

2.2 Throat Plates and Sewing Speed

- **Throat Plate Aperture:** The stitch hole must be adjusted to the needle size and material thickness. If the hole is too large, fabric can be pulled into it like a funnel, causing damage or skipped stitches.
- **Sewing Speed:** Generally, speeds between **2,000 and 3,000 stitches/min** are used. However, reducing speed prevents thermal damage and uneven seams on synthetic fabrics.

3. Stitch Selection and Threading

The integrity of a safety seam relies on the correct choice of stitch type and density.

3.1 Common Stitch Groups

- **Double Lockstitch (301 & 304):** Provides maximum seam strength for attaching Velcro, reflectors, and hard shells.
- **Double Chain Stitch (401):** Offers a balance of strength and elasticity, making it ideal for safety seams on stretch materials and knitted linings.

3.2 Stitch Density and Tension

- **Elastic Materials:** Approximately **5 stitches/cm (13 stitches per inch)** is recommended to allow for seam stretch.

- **Non-Elastic Materials:** 3–4 stitches/cm (8–10 stitches per inch) provides necessary stability for heavy Cordura or Nylon.
- **Tension:** The optimum tension depends on the thread, machine, and material layers. It should be as low as possible to prevent seam bursting or material distortion.

4. The Beissel Needle Guide

Selecting the right needle size and point is the most critical decision for quality assurance.

4.1 Performance Needle Features

For sewing firm materials and multiple layers, Beissel needles provide high-performance features:

- **Extra Blade Reinforcement:** Increases stability and minimizes needle deflection or breakage in thick layers.
- **Special Coatings:** For synthetic fabrics prone to melting, use a Teflon-coated needle to prevent melted residues from clogging the eye and groove.

4.2 Point Selection for Protective Gear

Material	Recommended Needle Size (NM)	Recommended Point Style
Leather & Heavy Lining	80 – 120 +1	R (Normal Round) or DH (Half Triangular) +2
Kevlar & Cordura	90 – 160 +1	R (Normal Round) +2

Knitted Interlining	70 – 80 +1	SUK (Medium Ball Point) +2
Neoprene	90 – 110 +1	SES (Light Ball Point) or R +1
Membranes & Foils	80 +1	SPI (Acute Round Point) +1

5. The Essential Thread Guide

The thread is the "silent hero" of protective gear. Choosing the wrong one can lead to seam failure under abrasion or high heat.

Thread Type	Key Features	Best Used For
Para-aramid (Kevlar)	High temperature resistance (up to 400°C), tear and cut resistant.	Stitching Kevlar; ideal for heat-intensive zones.
Bonded Polyamide 6.6	Extremely abrasion resistant (50–100% higher than polyester), handles high tension.	Outer seams, Velcro, reflectors, and hard synthetic shells. +2
PES Core Spun	High tensile strength and low shrinkage.	Knitted linings and stretch materials. +1

6. Troubleshooting and Pro-Tips

4 Simple Checks That Cut Needle Breakage and Boost Production

1 Check throat plates of all your sewing machines. They carry tell tale signs of needles having hit the throat plate.



Result

- Needle breakage.
- Thread breakages when it continuously brushes against rough edges.
- Frequent down time.

Corrective Action

- Select throat plate according to size of needle.
- Change damaged throat plates.

2 Most needle breakages happen when, due to incorrect machine setting, needle hits the hook point.



Result

- Needle breakages.
- Rough edges cause thread breakages.
- If the hook point is ground to smoothen rough edges, machine setting becomes challenging. Too close, and hook point hits the needle and just a bit away from needle, results in slipped stitches.

Corrective Action

- Frequent needle breakage in any single machine is a certain pointer to incorrect setting.
- Weekly check of hook point condition.
- Change damaged shuttle hook.

3 If Bobbin is wound manually, the side walls will go out of shape. Then it will be directly in the path of needle and will cause it to break.



Result

- Needle will break in an instant.
- Needle will become blunt and begin to cause bigger holes in garments.

Corrective Action

- Always wind the bobbin with the automatic device which spreads the thread evenly.
- Change bobbin if out of shape.
- After all, it is a low-cost item.

4 1-2-3 of needle breakage



If needle breaks in blade, it is certainly due to garment being pulled. The needle will break only in blade due to "Bending stress".



If needle breaks in the CAE, examine the tip, if it is damaged, it has most certainly hit a machine part – throat plate, shuttle hook or bobbin.

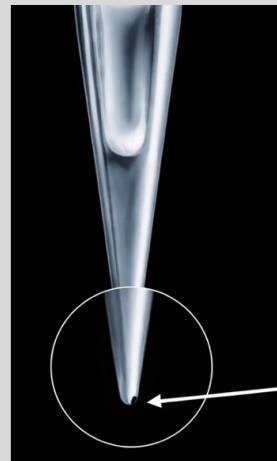
- **Avoid Skip Stitches:** Ensure the needle is fitted correctly and the needle size matches the thread. If the thread loop isn't forming, check if the throat plate aperture is too wide.
- **Prevent Thermal Damage:** Reduce sewing speed and use compressed air cooling if synthetic fabrics start to melt.
- **Identify Correct Points:** Use cutting points only for leather, as they may damage woven

or knitted protective fabrics.

- **Change Regularly:** In high-intensity production, change your needle at the beginning of every shift to avoid using worn points that cause quality defects.

Invisible Tip Damage — A Hidden Cause of Sewing Problems

Over time, every sewing needle develops microscopic damage at the tip. This damage is not visible to the naked eye and can be detected only under magnification (around 10×). It can occur due to incorrect machine settings, improper handling, contact with machine parts, or other external factors during normal use.



Once this invisible damage develops, the needle may still look “fine,” but it can cause thread breakage, fabric damage, skipped stitches, and accelerated wear of machine components.

Continuing to use such a needle until it breaks is costly and disruptive. Replacing the needle once it has crossed its useful life is far more economical than running it to failure. Timely needle changes protect the garment, the thread, the machine — and overall productivity.

=====|=====

7. The Beissel Advantage: Why the "Beissel Way" Wins

At Beissel, we combine German heritage with modern precision to create needles that handle sportswear with ease.

- At Beissel, we combine German heritage with modern precision to create needles that handle the toughest denim with ease.
- **Advanced Engineering:** Our unique curved CAE design ensures a long life, while the Reinforced Blade prevents needle vibration and deflection during heavy-duty sewing.
- **Milled Groove:** Our precision-milled groove protects the thread during high-speed operations, unlike some designs that can damage thread.
- **Hard Chrome Plating:** Our high-quality hard chrome plating provides rugged piercing power without the need for synthetic coatings.
- **Global Quality:** We are the only brand offering a full range of Industrial and Home needles, manufactured using German Technology. We conform to German DIN standards, carry the ISO 9002 mark, and comply with all BIS and Legal Metrology standards.
- **Made in India:** Proudly manufactured in a state-of-the-art plant in Southern India.
- **Business Ready:** We offer transparent and stable pricing, expert sewing advice, and GST-compliant invoices.

Proprietary Notice and Legal Disclaimer

No part of the contents of this guide, including text, tables, and unique branding elements, may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of **Altek Beissel Needles Limited**. For permission requests, please submit a formal inquiry to: sales@beisselneedles.com. In the event that written permission is granted, such permission must be explicitly acknowledged in the final work or publication through a clearly visible credit line stating: *"Reproduced with the express permission of Altek Beissel Needles Limited."* Failure to comply with these terms may result in legal action.

Altek Beissel Needles Limited



Proudly Indian

Registered office and factory:

Altek Avenue,
43/1C, ECR, New Chennai Township SEZ
Atchivilagam village,
Cheyyur Taluk,
Chengelpet district
Tamil Nadu 603 305.
GST:AAA 4302J 2Z8
PAN: AAACA 4302 J

CIN:U93090TN1988PLC035704

Whatsapp: 99401 74376

www.beisselneedles.com

email:sales@beisselneedles.com

=====