THE FASHION BIBLE

All you need to know
to make fashion fashionable.

WHAT'S INSIDE

WHAT THIS BOOK IS ALL ABOUT

Behind every fashionable label, there is a fashion designer.

Behind every fashion designer there is a fashion craftsman.

And behind every fashion craftsman there is a fashion tool.

The needle is the most critical tool in the repertoire of a fashion craftsman.

It's almost as important as the chisel for a sculptor. And a brush for a painter.

To make exotic designs a reality, one must know intimate details about the needle.

That's the reason why, we at Beissel, have put together this mini needle encyclopedia.

In this little tome, you will discover the science behind the craft of making fashion.

FLASHBACK

OF

NEEDLE HISTORY

The early needles were hand-made out of bone, over 17000 years ago by Western Europeans and Central Asians. It was used for sewing skins and furs.

28000 BC – The earliest known sewing needle is developed in Aurignacia. Hand crafted and made of bones, the needle has a split head instead of an eye.

17500 BC – The first needles with eyes emerge.

7000 BC – Copper needles are produced in Armenia.

2500 BC – Bronze needles are born.

1195 BC – Secret of hardening iron reaches Europe from India.

500 BC – The drawing plate is used for producing wire.

60 AD – Phrygier is credited with discovering embroidery.

1200 – The needle is advertised for the first time in China.

1496 - Leonardo da Vinci constructs a machine to point sewing needles.

1615 – Aachen shows the way by making needles from fine, pure steel.

1730 – Stephan Beissel founds a needle factory in Aachen, Germany.

1755 – First ever patent is awarded for a needle with an eye.

1790 – Thomas Saint applies for a patent for a machine to sew shoes.

1811 – Abel & Michael Morall are the first to construct a device for the pressing of eyes.

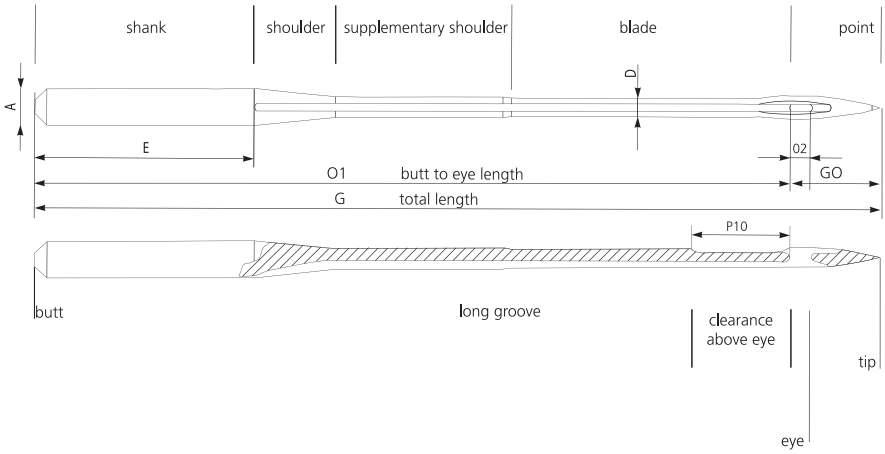
1845 – Elias Howe & Singer invent the sewing machine.

THE WHOLE STORY ABOUT PARTS OF A NEEDLE

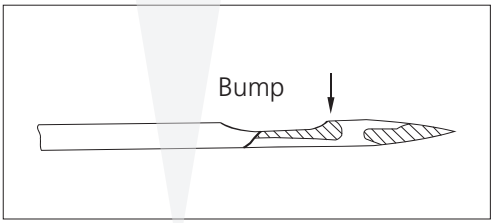
To the naked eye, a needle looks like a tiny piece of metal. Take a closer look and you will be amazed at the 20 odd parts that make up this magical fashion tool.

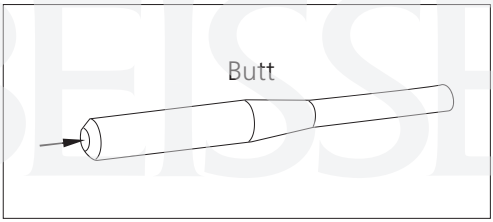
Attached are illustrations of the needle with proper labeling to help you study the parts.

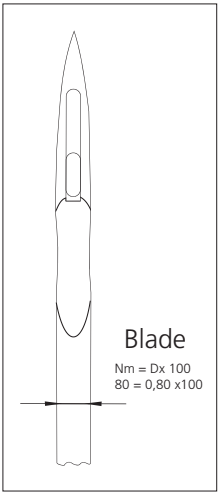
PARTS OF A NEEDLE



PARTS OF A NEEDLE



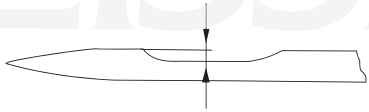




PARTS OF A NEEDLE

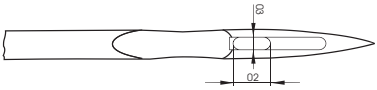
Butt to eye length

CAE Depth

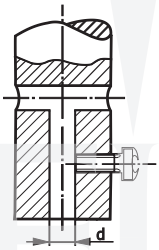


Eccentric tip

Eye length and width



Shank thickness



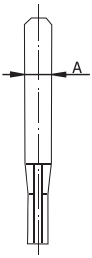
German

d (mm)	Tolerances (mm)	(mm)
1.64	+0.006	+0.020
2.00	+0.006	+0.020

Japanese

d (mm)	Tolerances (mm)	(mm)
1.64	+0.000	+0.050
2.00	+0.010	+0.050

Shank thickness



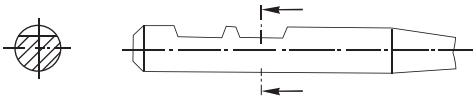
German

A (mm)	Tolerances (mm)	(mm)
<1	+0,020	-0,020
1-3	+0,000	-0,025
>3	+0,000	-0,030

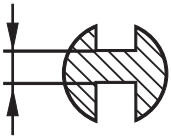
Japanese

A (mm)	Tolerances (mm)	(mm)
1,64	+0,030	-0,030
2,02	+0,030	-0,030

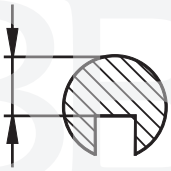
Notched shank



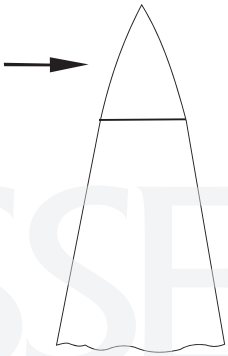
PARTS OF A NEEDLE

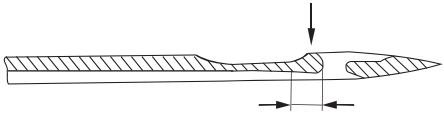


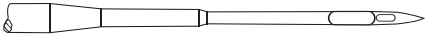
Double groove



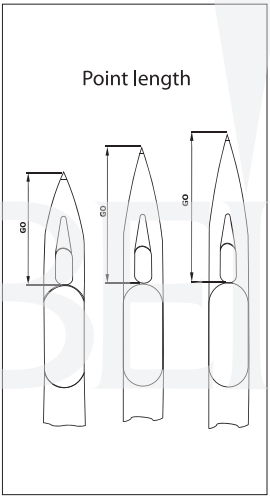
Single groove

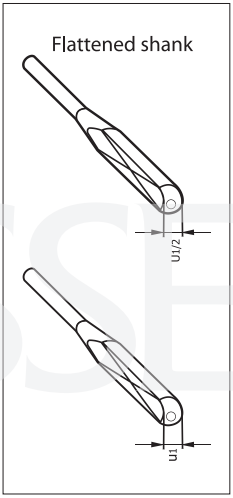


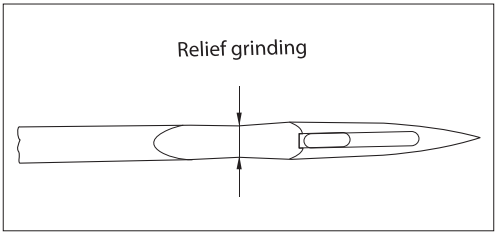




PARTS OF A NEEDLE







CUTTING POINTS

W

Narrow Wedge Point (P)

CR

Cross Point (S)

TW

Twist Point (LL)

TRI

Triangular Point (LL)

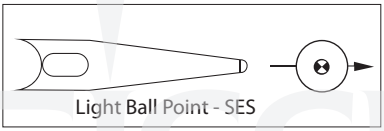
SQ

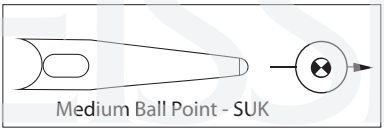
Square Point (Q)

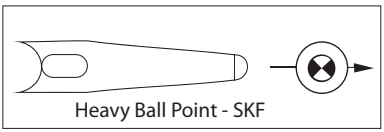
RTW

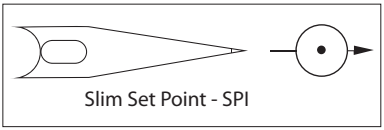
Reverse Twist Point (LR)

ROUND POINTS

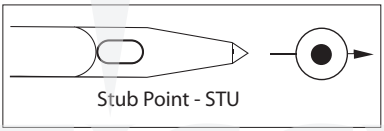


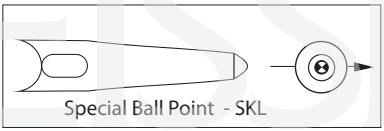


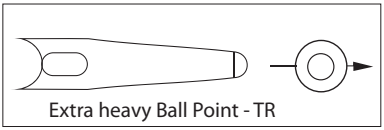


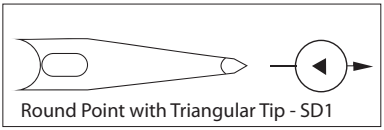


ROUND POINTS







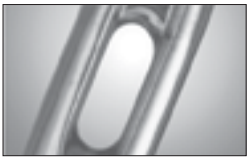


HOW TO TELL A GOOD NEEDLE FROM A BAD ONE

While a fortune is spent on sewing machines, the sewing machine needle is hardly given any serious thought. Therefore, it doesn't come as a surprise that not many know about the standard features that define a good sewing machine needle. The choice of a good needle is crucial for a flawless finish. A good sewing machine needle must have the following attributes:

SMOOTH EYE

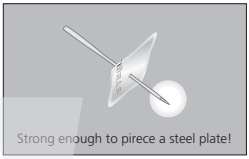
The eye of a needle must be smooth. Otherwise, the thread will break/fray in the to and fro motion and spoil the garment. A thread which frays will get cut after the garment is washed a few times. Lammertz invented the chemical deburring technology, which is now used by all needle manufacturers in the world. This technology not only polishes the eye but also the groove and all other parts resulting in perfect smoothness and curves.



Smooth Eye

STRONG TIP

A needle is good only as long as the tip is in shape. Beissel needles are designed for tip hardness of 750-850 HV. As a result, Beissel chrome plated needles are sharp enough to penetrate even a steel plate and still retain their tips!



Strong Tip

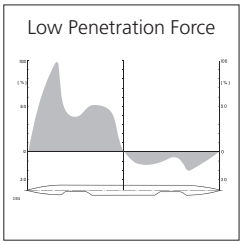
ELASTICITY

A good needle must be elastic. Best needles are elastic and will not stay as bent. Beissel needles bend sufficiently to take in their stride additional resistance caused by increasing layers, but return to straight position immediately afterwards. Needles which tend to stay bent cause larger losses far in excess of the cost of a needle itself, because they not only damage the garment but also expensive machine parts such as looper, throat plate etc.

Elasticity

LOW PENETRATION FORCE

The penetration force required to enter the sewn material must be least. Greater force will increase the workload on the machine and decrease its life. A needle must be made from quality wire and subjected to best heat treatment to meet this requirement.



STABILITY IN SEWING

Modern sewing machines run at high speeds even up to 10000 stitches per minute. It takes a well-made needle to remain stable at these high speeds in order to give aesthetic finish to the sewn product.

Getting to know the features of a "good needle" goes a long way in choosing the right one for a good finish.

Now get to know the flip side as well. Did you know that a "bad needle" can wreak havoc both on the fabric and the sewing machine?

Uneven groove | Bad Eye | Uneven CAE | Blunt Tip

Here's how you can spot the troublemaker.

A "**bad needle**"

- is of inferior quality
- the tip is blunted causing problems like "skipped stitches".
- causes damage to expensive machine parts and sewn garments.
- puts undue pressure on the sewing machine thus reducing its life.
- has a shorter life span and you have to go through the trouble of frequently replacing the needles.
- causes frequent thread breakage due to "burring".
- is made from inferior quality raw materials and breaks frequently, thereby causing damage to the sewing machine.

11 STEPS FOR MAKING A NEEDLE

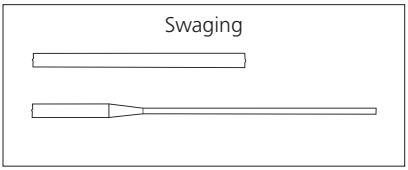
Needle making is a fascinating technology. There are thousands of types of needles and each needle goes through more than 100 steps before emerging as a finished needle. Needle making is a combination of precision engineering, chemical engineering and metallurgy. The following is a brief outline of the major steps in manufacturing a needle.

1. SELECTION OF WIRE

Correct composition of wire is the key to a high quality needle. High carbon steel wire is the main raw material. The wire is tested for its diameter, tensile properties and absence of surface defects. For this purpose, a number of chemical and metallurgical examinations are conducted before the supplied wire is taken into production.

2. SWAGING

The wire is cold forged to the final thickness of the needle blade.



3. SHANK MARKING

The shank is marked with the unique trademark of Beissel as well as the size of the needle.

Shank Marking

4. DIE PRESSING AND PUNCHING

This is the most important operation and forms the core of needle technology. A master tool is made which is used to press the eye section of the needle. Every needle is accurately die-pressed to give the same depth of scarf, perfect eye rounding and other dimensions which are critical for stability in sewing.

Die Pressing

5. MILLING

The long groove of the needle is milled in a special purpose machine. The thread travels through this groove.

Milling

6. BARB GRINDING AND SOFT POINTING

During the die press operation, a "barb" results which has to be removed by grinding. This is done in an automatic machine. This is followed by soft pointing of the needle to give the point its initial shape. Precise pointing - be it round, ball or cutting point - is done at a later stage after the needle has gone through hardening or the heat treatment process.

Barb Grinding

7. HARDENING

This process gives the needle its strength and elastic properties for superior performance. This happens in a special furnace protected by creating a special oxygen-free atmosphere to prevent oxidation of the surface and also to ensure that there is no loss of carbon from the steel. Needles coming out of the furnace are quenched in an oil bath and finally kept for a pre-determined period in a deep cooler at a temperature below minus 70 degrees centigrade. This operation transforms the remaining austenite and increases the toughness of the needle.

8. CHEMICAL DEBURRING

This is a very important operation that leaves the surface of the needle smooth all over. Once upon a time, thread polishing of the eye of the needle was done to give it smoothness. Lammertz invented the chemical deburring process that gives a silky smooth surface finish not just to the eye but also to the groove as well as other parts of the needle. All needle manufacturers now follow this chemical deburring technology.

9. STRAIGHTENING

This stage involves straightening of the needle that might have become bent as a result of all the previous processes.
Straightening of the needle is done using state-of-the-art technology that detects bends, rectifies them and also checks for straightness before it comes out of the machine.

10. PLATING

Industrial sewing machine needles are chrome plated and household needles are nickel plated. This operation is carried out in a large, completely automated operation without human interference. The plating gives a glossy appearance to the needles and also protects the needles from corrosion, wear and tear, besides reducing friction during sewing. The needle has now reached its final destination!

11. FINAL POINTING AND POLISHING

After plating the needle is readied for precise pointing and polishing.

Pointing & Polishing

Finished Needle

That, in brief, is the production process. We hope the above details give you an idea of the complexity and the intense effort required to make a high quality needle. We've skipped several intermediate operations because they are way too many to describe.

HOW TO FASHION THE FINEST QUALITY NEEDLES

A good needle is a pre-requisite for good sewing and finish of any product. Modern day sewing machines operate at speeds exceeding 5000 stitches per minute. This means that the needle travels at a speed exceeding 15 km per hour! Whatever the sewn product - be it leather, garment etc, it is the seam which joins everything together and is crucial to the finish and quality of the final product. That's why we stop at nothing, when it comes to quality control.

PRODUCTION INSPECTION

The sewing machine needles are inspected using established statistical quality control parameters at every stage of production. This comprises:

- Measuring the main dimensions (shank and blade diameters, butt to top of the eye distance, length of point, etc)
- Checking special shapes (cone-shaped point, tip, etc)
- Bending properties (elastic limit, breaking angle, breaking force)
- Eye testing (free of fins)
- Measuring the hardness and thickness of the surface layer (nickel, chromium)
- Visual inspection (blemishes, etc)

PRODUCT INSPECTION

The finished sewing machine needles are inspected using established statistical Quality Control (DIN 40 080) techniques.

The needle is checked for predetermined quality parameters at the end of every single operation. All these together total 155 different checks for every single needle. After the needle manufacturing process is completed, every single needle is visually inspected for a further 25 parameters. Only those needles that pass every one of these tests reach our customers:

A) BREAKING ANGLE TEST

The single most important quality that a needle must meet is that it should be strong and must not break easily. A specially designed computer controlled device is used to ensure that the needle retains a certain elastic property and does not break within specified limits.

B) ELASTICITY TEST

The needle must have elastic property. Additional layers in sewing (e.g. collar attachment) pose sudden resistance which can be met only if the needle is elastic. It is mandatory that the needle returns at once to its straight position. If not, there will be problems of skipped stitching and damage to vital sewing machine parts. This elastic limit is continuously monitored.

C) EYE TEST

Cotton thread (though polyester is a more commonly used thread and breaks less easily) is used and tested rigorously under conditions far more severe than real life conditions. If the cotton thread does not break, the needle batch is passed by our Quality Control department.

D) TORTURE TEST

Our Quality Control department is equipped with modern sewing machines for real life testing of needles. Our technicians sew non-stop for 20 minutes on several layers (garment and leather) to inspect whether the needle performs without breakage.

E) GUN SHOT TEST

This is the ultimate test that determines the strength and tip hardness of the needle. A needle is shot through a steel plate and the tip is checked. The tip must remain sharp and intact.

These painstaking steps are a must to ensure top notch needles. At Beissel, we stick to this Quality Control regime almost every day. No wonder we've managed to win seals of approval from the finicky gentlemen who award the ISO 9002.

VITAL TIPS ON

LIFE OF A NEEDLE

A good needle is like an egg. Even if a weight of 75 kg is applied on top of the butt with tip facing downwards (as in a normal sewing operation) the needle will not break. The point we are trying to make is a well made needle has a real long life if it can handle the rough and tumble of sewing. And only if it can cope with the various types of mechanical stress.

MECHANICAL STRESS ON THE NEEDLE

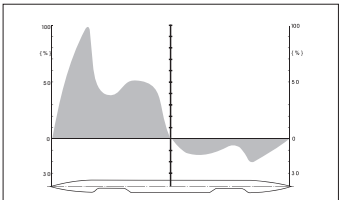
During sewing process, the needle is stressed by forces acting in two different directions:

1. Forces that cause a deflection of the needle from its proper stitching direction causing bending stress.
2. Forces that counteract the needle's penetration into the fabric causing buckling stress.

BENDING STRESS

The bending of a needle may be caused by -

- Lumps or non-homogeneousness of the fabric
- Sewing over cross-seams or pins
- High thread tension
- Pulling the fabric manually while stitching
- Removing the fabric from the machine without releasing the needle thread tension

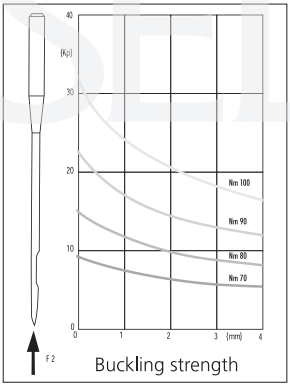


Resistance to penetration

A bent needle may also hit the presser foot, throat plate, or even the looper/hook causing damage. Therefore, a bent needle causes a greater damage than the cost of the needle itself.

BUCKLING STRESS

Every time a needle penetrates the fabric, it is under buckling stress. This resistance depends upon the type of fabric, amount of plies, finish of fabric, needle size, and shape of point. The resistance to penetration reaches its peak shortly before the eye immerses into the fabric. When penetrating and rising, the sewing machine needle is heated by the friction between the needle and the fabric. Depending upon sewing conditions, the heat may cross 400°C, when the hardness of the needle is affected and becomes worthless.



Buckling strength

The mechanical loading capacity of the needle is reduced especially in the CAE/scarf area of the needle during stitching. When a needle breaks due to Buckling Stress it invariably breaks in the CAE area.

HOW TO FEEL AT HOME WITH HOME SEWING.

Household sewing is much more than just knitting sweaters and mending buttons. There's a lot of science to it. Every task needs a specific needle. To help you pick the right one for the right job, we've put together this little classification:

HOUSEHOLD GENERAL PURPOSE NEEDLES

UNIVERSAL POINT NEEDLES

These are slightly rounded yet sharp pointed needles. Suited best for sewing knit and tightly woven fabrics. Sizes preferred: 8/60 to 19/120.

MICROTEX NEEDLES

Sharp pointed needles for stitching woven fabrics, including silk and micro fiber fabrics. Used especially for top stitching and edge stitching. Sizes preferred: 8/60, 10/70, 12/80 and 14/90.

BALL POINT NEEDLES

Needles with slightly rounded tips with the ability to go between the threads of a knit fabric instead of piercing like a sharp-point needle. Sizes preferred: 70/10 to 100/16.

HOUSEHOLD SPECIALTY NEEDLES

DENIM NEEDLE

Needles with very sharp point and stiff shank. Used for stitching jeans, canvas and multiple layers of fabric. Sizes preferred: 10/70 to 18/110.

STRETCH NEEDLE

Designed for stitching knit fabrics that contain spandex. This needle has a deeper scarf that prevents skipped stitches. May not be compatible for all machines. Sizes preferred: 11/75 and 14/90.

TOPSTITCH NEEDLE

Extra sharp pointed needles with an extra large eye and a large groove to accommodate topstitching thread. Use for topstitching. Sizes preferred: 12/80, 14/90 and 16/100.

LEATHER NEEDLE

Needle with a slight cutting point for stitching leather, suede and vinyl. Never use this on woven or knit fabrics. Sizes preferred: 12/80 to 18/110.

HEMSTITCH/WING NEEDLE

Point needle with wide metal wings on the sides to create large holes in tightly-woven fabrics, such as linen and batiste. Used for hemstitching, heirloom embroidery and other decorative stitching. Sizes preferred: HEM/100 and HEM/120.

QUILTING NEEDLE

Tapered needle with a sharp point for stitching through multiple layers of fabric and intersecting seams. Sizes preferred: 11/75 and 90/14.

MACHINE EMBROIDERY NEEDLE

Designed with a special scarf and a large eye to prevent shredding and breakage when sewing with rayon and special machine embroidery threads. Sizes preferred: 11/75 and 14/90.

METALLICA NEEDLE

Needle with special scarf, large eye and large groove prevent shredding of delicate metallic threads during stitching. Size preferred: 12/80.

SELF-THREADING/HANDICAP NEEDLE

General purpose needle with slip-in threading slot for those who have difficulty threading needles. Sizes preferred: 12/80 and 14/90.

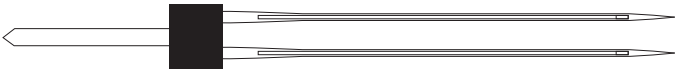
TITANIUM NITRIDE NEEDLES

Speciality needles with Titanium Nitride coating. Renowned for having 4 to 6 times longer life than traditional nickel or chromium plated needles. Reduced friction between needle & thread, wear resistant needle points, lesser skip stitches and needle breakages are some key benefits of these needles. Ideal for sewing heavy denims, embroidered stuff and stitching using metallic threads.

TWIN NEEDLES

Constructed with two needles on a crossbar from a single shaft, twin needles sew two rows of stitching at the same time. They are primarily used for heirloom sewing, decorating stitching, and anywhere else that may require multiple, uniform stitching rows.

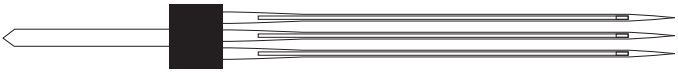
Sizing for twin and triple needle is slightly different from others. The first number represents the distance between the needles and the second number is the European needle size. For example, a double needle sized 1.6 /80 would mean that the needles are millimeters apart and that a size 80 European (12 American).



Twin needles come in a variety of types: Twin Denim (Size: 4.0/100), Twin Stretch (Sizes: 2.5/75 & 4.0/75), Twin Embroidery (Sizes: 2.0/75 & 3.0/75), Twin Metallic (Size: 2.5/80), Twin Hemstitch and Twin Extra Wide (Sizes: 6.0/100 and 8.0/100).

TRIPLE NEEDLES

Constructed with three needles on a crossbar from a single shaft, triple needles sew three rows at the same time. They are usually preferred for decorative stitching. Sizes preferred: 2.5 and 3.0.



SPECIAL TECHNIQUES

FOR SEWING

SPECIAL MATERIAL

1. SEWING OF LEATHER

The special structure of a natural material such as leather makes great demands on the needle during sewing.

SELECTION OF THE SUITABLE NEEDLE SIZE

On the one hand, the needle should make holes in the material which are as small as possible and close up again. This, among other things, requires a small needle diameter. On the other hand, however, most leathers offer a considerably stronger resistance to the penetrating needle than fabrics. For this, as strong a needle as possible is required. A larger needle size is also required when thicker sewing threads are used, particularly for fancy stitching on leather, to ensure that the needle eye is large enough to accommodate the thicker sewing threads. The needle size should therefore be chosen, so that it matches the sewing threads selected. Then again, there are the various types of leather. From the most delicate kid leather to all kinds of patent, nappa and suede leather and strong buff leather, you have different varieties each with its characteristic properties. Considering the wide variety of leathers, as well as the fact that frequently cardboard or plastic stiffeners have to be sewn with leather, it is practically impossible to make a general recommendation on the most suitable needle sizes.

SELECTION OF THE SUITABLE NEEDLE POINT FOR SEWING LEATHER

Decisive for the appearance of the seam, when sewing leathers and other materials having a similarly uniform structure, is the shape of the needle point. It can be rounded or provided with cutting edges.

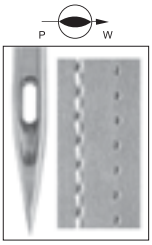
Because of their low coefficient of friction, points with cutting edges are ordinarily preferred as far as the sewing of leather is concerned. However, round points will always be employed when leather is sewn together with textiles. In the latter case, before employing needles with cutting points, it must be established whether or not the woven or knitted fabric will be cut.

NEEDLES WITH CUTTING POINTS FOR SEWING LEATHER

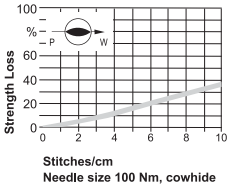
The effect of cutting points reduces the relatively high resistance with which the leather counters the penetrating needle. Moreover, the appearance of the seam is influenced by the position and shape of the cutting point. Comprehensive studies have shown that 5 different cutting points are sufficient to fulfill all of the leather industry's requirements with regard to the seam appearance.

WEDGE POINT (W/P)

Point Design	It is ground in the shape of a wedge. The cutting edge is parallel to the threading direction.
Resultant Stitch Hole	Cuts leather at right angles to the sewing direction.
Seam Appearance	The sewing thread is drawn on at an inclined position pointing slightly to the left. The thread lies on the leather like a bead.
Strength Loss	Of the 5 different cutting points, the Wedge Point results in the smallest strength loss.
Needle Heating	If the needle heating with a round point is taken as 100%, the needle temperature is reduced by approx. 5% when using wedge point.
Notes on Application	Produces seams of high strength despite high stitch density.

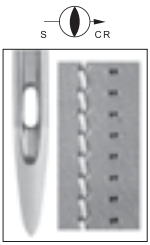


Relationship between
Stitches/cm and Strength Loss

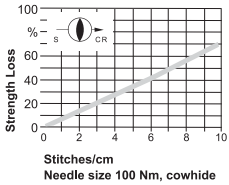


CROSS POINT (CR/S)

Point Design	It is ground in the form of a wedge. The cutting edge is positioned at an angle of 90 degrees to the threading direction.
Resultant Stitch Hole	Cuts leather in the direction of the seam.
Seam Appearance	The sewing thread is drawn in straight and particularly strongly into the stitch holes.
Strength Loss	Only the Triangular Point results in a greater strength loss than the cross point.
Needle Heating	If the needle heating with a round point is taken as 100%, the needle temperature is reduced by 15% when using cross point.
Notes on Application	Produces straight seams with a well drawn-in thread. Do not select a high stitch density.



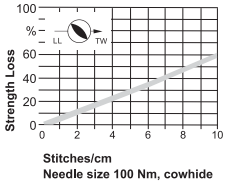
Relationship between
Stitches/cm and Strength Loss



TWIST POINT (TW/LL)

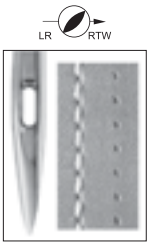
Point Design	It is ground in the form of a wedge. The cutting edge is positioned at an angle of 315 degrees to the threading direction.
Resultant Stitch Hole	The leather is cut from top left to bottom right, as seen in the direction of transportation.
Seam Appearance	The sewing thread is drawn straight into the stitch holes.
Strength Loss	The strength loss when using a twist point corresponds to the strength loss which results from the use of Reverse Twist Point.
Needle Heating	If the needle heating with a round point is taken as 100%, the needle temperature is reduced by approx. 10% when using a Twist Point.
Notes on Application	The Twist Point produces a straight seam with drawn in sewing threads. The shape of the point enables straight seam with a higher stitch density than is attainable with the cross point.

Relationship between
Stitches/cm and Strength Loss

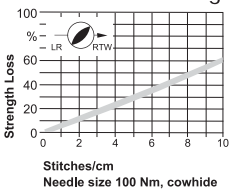


REVERSE TWIST POINT (RTW/LR)

Point Design	It is ground in the form of a wedge. The cutting edge is positioned at an angle of 45 degrees to the threading direction.
Resultant Stitch Hole	The leather is cut from top right to bottom left, as seen in the direction of transportation.
Seam Appearance	The sewing thread is drawn into the stitch hole diagonally, from top left to bottom right.
Strength Loss	The strength loss when using a Reverse Twist Point is between the Wedge point and the Cross point.
Needle Heating	If the needle heating with a round point is taken as 100%, the needle temperature is reduced by approx. 10% using Reverse Twist Point.
Notes on Application	Needles with a Reverse Twist Point are used to attain decorative effects, on account of the inclined angle of the sewing thread.

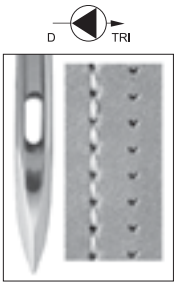


Relationship between
Stitches/cm and Strength Loss

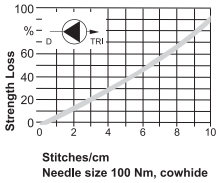


TRIANGULAR POINT (TRI/D)

Point Design	It has 3 cutting edges. One of the cutting edges is parallel to the threading direction, while the other two are at an angle of 90 degrees to the threading direction.
Resultant Stitch Hole	The triangular point cuts the leather strongly in the direction of transportation and slightly less at right angles to the direction of transportation.
Seam Appearance	The sewing thread is drawn strongly into the stitch holes, at a very slight inclination pointing to the left.
Strength Loss	The triangular point has the greatest cutting effect and leads to the highest strength losses of all types of leather according to the number of stitches per cm.
Needle Heating	If the needle heating with a round point is taken as 100%, the needle temperature is reduced by approx. 20% when using a triangular point.
Notes on Application	Needles with a triangular point should be used on thick hard leathers. In due consideration of the strength loss which results from the use of the triangular point, it is of vital importance to select an appropriate number of stitches per cm.



Relationship between
Stitches/cm and Strength Loss



2. SEWING OF KNITTED FABRICS

Knitted fabrics are a combination of loops in a row. Their sewability depends on factors like the type and size of the yarn, nature of the raw material, the density, size and regularity of the loops and their finish.

So while sewing knitted fabrics, the choice of the needle with the correct size and point form a vital importance.

SELECTION OF THE SUITABLE NEEDLE SIZE

While sewing knitted fabrics, the choice of the needle has to be a thinner one. The yarns of finer variety are used for manufacturing knitted fabrics. So needles more than Nm 90 cannot be used.

While changing from thicker to thinner needles, the needle plate should also be changed. It is important when sewing elastic materials that the hole in the needle plate matches the thickness of the needle to avoid material being pulled into the hole of the needle plate.

SELECTION OF THE SUITABLE NEEDLE POINT

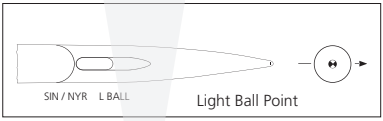
It has been found that knitwear cannot be sewn with the normal round point as the inter looping are often hit and pierced by the needle. When there is elasticity in the material, the meshes get easily damaged. Therefore, needle with the ball point pushes the yarn aside at the time of penetration, leaving the material from getting damaged. For the circular and warp knitted materials, light ballpoint is the needlepoint to be used. Heavier materials require medium ballpoint needles.

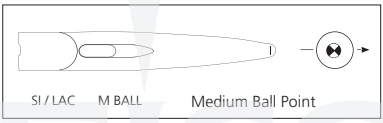
While sewing knitwear, point form is vital and the point or tip should be absolutely free from burrs or sharp edges. Even slightest unevenness in the point will result in greater damage to the material than the needles that are too thick or with the wrong points. It is important to check the condition of the needle regularly and change them whenever necessary. The same conditions apply to the needle plate, presser foot and feed dog as well.

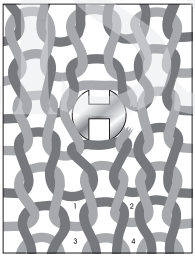
Besides the above, humidity plays a great role in damage to the materials. Dry air creates brittleness to the material. Correct air temperature in the storing rooms and sewing rooms should be maintained. Sewability can be further enhanced by using a thread lubricant, which forms a film on the surface of the needle, thereby reducing the friction between the needle and the material. Use of silicon oil also makes the meshes more elastic.

Nowadays, there is a habit of sewing leather and imitation leather along with the knitted goods. While cutting points are generally used for sewing leather, it should under no condition be applied here. In such cases, only "round point" needles must be used.

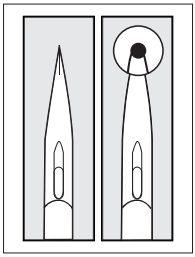
Needle Point Selection







Normal round point cuts the yarn



The diameter of the Ball Point needle tip is 15%
of the diameter of the thickness of the needle

HOW TO AVOID MESH LOOP DESTRUCTION

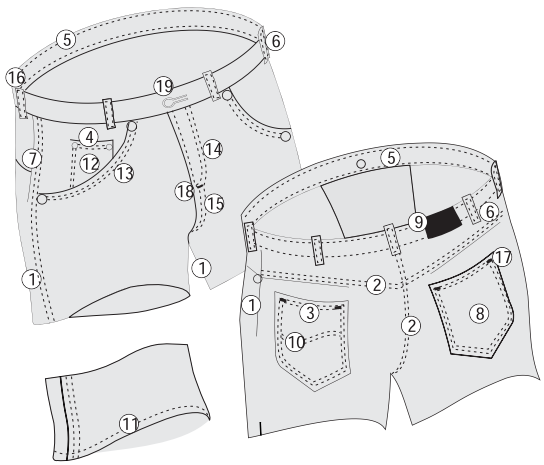
To prevent the destruction of mesh fibres, the following requirements should be observed.	X	✓
use sewing machine needles with ball point		
do not use damaged needles		
use the smallest possible needle size	 Nm 100	 Nm 70
throat plate, presser foot, feed dog must be burr free		
knit fabric should be used with the appropriate finishing.		

3. SEWING OF JEANS

Denim is a thick, hard, unwashed fabric. The penetration resistance to the needle is very high and large size needles are used. This is especially the case when sewing multiple plies or sewing over seams.

As everybody is conscious of the needle breakage and are uncertain about the size of the needle to be used, needles of larger size than necessary is chosen. This results in damage to the fabric, which is visible only after washing. This makes the choice of the needle size.

The most commonly used denim is 14 Oz. For softer, lighter weight or stretch fabrics, choose a needle approximately 2 sizes smaller.



GENERAL TIPS AND SUGGESTIONS

LIFE OF THE NEEDLE

The wear and tear of the needle is influenced by a multitude of factors. The most important one is the condition of the point. To avoid garment rejects caused by damaged points, needles should be changed every 8 hours in operations involving multiple plies such as double felled seams, attaching pockets and bartacking on automatic machines.

Tip: Change needles every 24 hours on other operations but always check the tip regularly.

Sewing machine needles deflect more when sewing denim and can hit the machine parts. This not only ruins the tip of the needle but also the fabric thread when sewn with that needle. The use of slightly rounded point, than the normal round point helps in avoiding this problem. But this is true only in the 2 needle chain stitch systems UY128 GAS, 149X3 and B63.

SEWING SPEED

While sewing over seams, there is undue stress for the needle, which results in premature breakage. To avoid needle breakage, slow down the machine speed.

Tip: Denim with elastomer (stretch) should not be sewn at full speed to avoid thermal damage to the fibres.

SEWING THREAD

Sewing thread plays a crucial role in sewing denim. Hence, use of quality thread is very vital. The seams are strained especially as the jeans are washed and/or bleached after completion. Moreover seams have to be decorative. It is recommended that core spun thread be used.

The size of the sewing thread should correlate to the size of the needle. Details are furnished below:

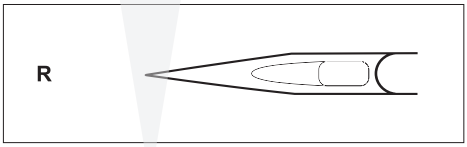
NEEDLE SIZE	THREAD SIZE
100 - 110	50
110 - 130	30 -35
130 -160	20 -25

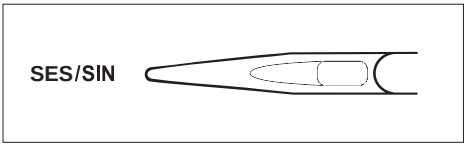
POINT STYLE OF THE NEEDLE

Use of normal round point is recommended for all the sewing operations. Use of rounded points (ballpoint) recommended for special applications mentioned above.

Tip: Always use a light ball point when sewing stretch denim or denim with a combination of elastic fabric in order to avoid material damage.

CHOOSING NEEDLE POINT STYLE FOR SEWING JEANS

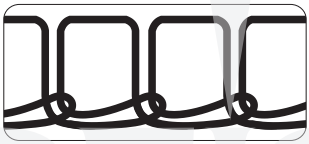




Check your machine catalogue for exact system.

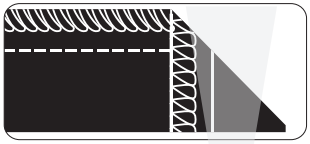
Most important sewing operations for the manufacture of jeans

DOUBLE CHAIN STITCH 401



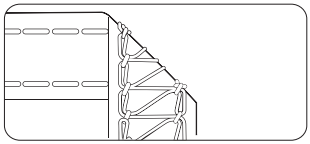
Operation	No.	Needle System	Needle Size
Join inseam or outseam	1	UY 130 GS	125-130
(felled) seam		UY 128 GAS	125-130
		149 x 3	125-130
Sew on riser	2	UY 128 GAS	125-130
Seatseam (felled seam)	2	149 x 3	125-130
Hem back pocket and	3	B 64	125-130
watch pocket	4		
Sew on waistband	5	62 x 57	140
		UY 113 GS	140

OVERLOCK (SAFETY STITCH) 516



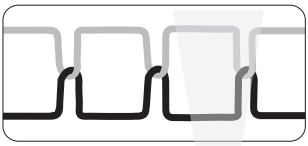
Operation	No.	Needle System	Needle Size
Join inseam or outseam	1	B 27	120
Serging fly facing		DO x 5	120
		DC x 27	120
		B 29 A	120

INTERLOCK WITHOUT TOP COVER 406



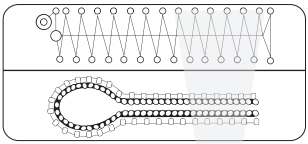
Operation	No.	Needle System	Needle Size
Make belt-loops	6	B 63	120-125
		UY 128 GAS	120-125

LOCKSTITCH 301



Operation	No.	Needle System	Needle Size
Topstitch on side seam	7	134 R	130
		134-35 R	130
Topstitch on side seam	7	134 R	120-130
Attach back pockets	8	DB x 1 – DP x 5	120-130
Finish end of waistband			
Attach label on waistband	9	134 R	120-130
Design on back pocket	10	DP x 5	120-130
Bottom hemming	11	UY 180 GS	140
		DP x 5	140
		134 R	140
Attach back pockets	8	134 SPECIAL	120-130
		438	120-130
		DP x 5 SPECIAL	120-130
Attach back pockets	8	134 or 134-35	130-140
Hem watch pocket	4	135 x 5	130-140
Attach watch pocket	12	DP x 5 / DP x 17	130-140
Turn and topstitch front pocket	13	DP x 5	130-140
Topstitch leftfly piece	14		
Close crutch seam	15		

FINAL OPERATION SUCH AS BARTACKS (301) AND BUTTONHOLE (404)

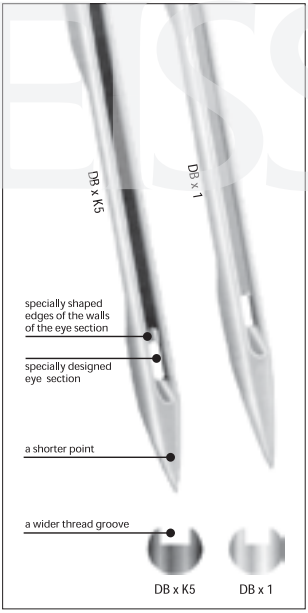


Operation	No.	Needle System	Needle Size
Attach belt loops	16	1135 x 17 / 135 x 5	120
Bartacks on pockets	17	DP x 5 / DP x 17	120
Bartacks on fly	18	DP x 5	
Set belt loop	16	DP x 17	120
		438	120
		DP x 17	120
Buttonholes	19	501 SC	120
		558	120
		DO x 558	120

4. SEWING OF EMBROIDERY

The following needles are used for embroidery applications:

854 S	Shuttle embroidery machine
253 C	Crank embroidery machine
DBXK5	Single or multi head embroidery machines



While working on the single or multi head embroidery machines there is a possibility of stress situations due to the following:

1) The pantographic movement of the fabric in the frame
2) Large transport distances
3) Extraordinary high friction forces on the thread due to:
   a) Large cross-stitching widths
   b) Continuing movement of the upper thread when the needle is not in operation
   c) Use of metallic threads
   d) Intentional use of different sized threads

DBXK5 are the needles recommended for single and multi head embroidery machines as the special shape of the groove edges improves the friction conditions of the thread. A wide long groove protects the special embroidery threads from excessive friction with the fabric. The large eye creates fewer problems when using bulky thread. The optimal point provides safety when embroidering thick material at high transport speeds.

COMMON EMBROIDERY PROBLEMS, POSSIBLE CAUSES AND SOLUTIONS

PROBLEM	POSSIBLE CAUSES	SOLUTION
Thread breaks, slides up one ply above the needle eye	1. Burr on hook 2. Point of hook too far away from needle 3. Machine threaded incorrectly 4. Incorrect needle bar	1. Replace or polish hook 2. Adjust distance 3. Rethread machine correctly 4. Adjust needle bar height
Top thread is pulled to back side of the garment creating a thread pileup on the backside	1. Tension too tight 2. Machine threaded incorrectly 3. Dry hook race	1. Adjust tension 2. Rethread machine correctly 3. Lubricate race
Excessive breaking	1. Incorrect hook timing 2. Incorrect needle bar height 3. Burr on hook 4. Tension too tight 5. Needle incorrectly installed in needle bar 6. Poor quality thread	1. Adjust timing 2. Adjust needle bar height 3. Replace or polish hook 4. Adjust tension 5. Reinstall needle, make sure scarf of the needle is facing the hook. 6. Use better quality thread
Stitching does not follow pattern outline	1. Bent needle 2. Hoop loose in frame	1. Replace needle 2. Tighten hoop in frame
Frame board shifts out of alignment while pattern is running.	1. Machine running too fast	1. Adjust machine speed (if pattern is not programmed ot slow down, use the computer to change to slower speed)
Flat or hidden stitches	1. Tension too tight	1. Loosen tension

PROBLEM	POSSIBLE CAUSES	SOLUTION
Flat or hidden stitches	2. Nap or pile fabric tends to hide thread	2. Use temporary transparent film topping material to make stitches stand up
Needle holes in garment	1. Materials loose in hoop 2. Thin material 3. Too many stitches at point of cut 4. Burred needle	1. Make tight in hoop 2. Add tear away backing or cut away backing 3. Change pattern for satisfactory look 4. Replace needle
Difficulty in threading needle	1. Eye too small for thread	1. Use oversizes or round eye needle
Thread pig tailing	1. Top tension too tight	1. Adjust for minimum tension. Use mesh sock around thread on cone
Looping	1. Too many stitches in pattern 2. Tightly woven material	1. Reduce stitch count 2. Adjust tension for greater consistency
Thread pulls out of needle after trimming	1. Lint in thread holder 2. Tension too tight	1. Clean thread holder 2. Loosen tension. Sew at least three slow stitches after each trim to anchor thread.

5. SEWING OF MICRO FIBRE FABRICS

Fabrics made out of Micro Fibres are produced in different weaves and with different finishes. The amount of warp and weft threads per centimeter is relatively high. The threads are made out of single fibres with a fineness of 0.5 dtex and lower. 0.5 dtex = 10.000 metres of single fibres weigh 0.5 gm or if the single fibre was wrapped around the globe, it would be 40,000 km long and weigh only 2 kg. This very close weave of the fabric leads to displacement puckering which can be reduced if:

1) The smallest possible needle size is used
2) A double chain stitch is used (no interlocking of the stitch in the middle of the fabric)
3) The seam is not parallel to a warp or weft thread
4) The stitch density is low (3.5 to max. 4 stitches per cm)

The other important points to be noted when sewing a micro fibre fabric:

Needle Point	Normal Round Point
Thread tension	Low
Presser foot pressure	Low
Stitch hole diameter	Not larger than 1.8 mm
Sewing speed	As slow as possible

SOLVING UNSOLVEABLE SEWING PROBLEMS

THREAD BREAKAGE

The breaking of thread during sewing is broadly due to:

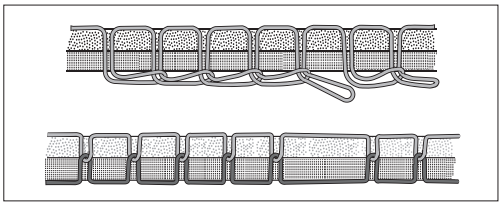
1. Tensile stress
2. Fraying
3. Needle heating
4. Combination of the above

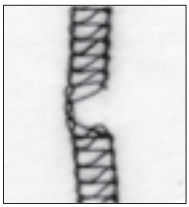
The specific causes of thread breakage can be tackled as follows:

CAUSE	RECOMMENDATION
Thread tension too light, too loose.	Readjust tension.
Hook/looper not adjusted correctly.	Readjust hook/looper setting.
Hook/looper point damaged.	Polish hook/looper point or replace with new hook/looper.
Burrs on thread guiding elements.	Polish thread guiding elements.
Insufficient hook lubrication.	Ensure sufficient oil supply by paper test.
Needle bar height not correct.	Reset to standard and check loop formation.
Wrong needle system.	Change to correct needle system.
Check spring not properly adjusted.	Readjust check spring.
Needle clogged by melted residues.	Replace needle, change to anti-clog finish, lubricate thread.

CAUSE	RECOMMENDATION
Poor thread quality.	Change to thread with correct finish.
Throat plate needle hole burred.	Polish needle hole or replace throat plate.
Wrong needle size.	Change needle size to match thread size.
Needle thread not unwinding.	Adjust overhead thread properly from coneguides, check cone.
Needle thread snarling before tension discs.	Increase wraps on pre-tension thread guides and/ or increase tension.
Excessive needle heat.	Apply needle coolers like thread lubrication /air or use corespun thread.

SKIPPED STITCHES





Skipped stitches ocur when the loop of the needle thread is not picked up by the point of the hook or the looper. There are many ways to tackle it.

CAUSE	RECOMMENDATION
Check spring not properly adjusted.	Readjust check spring.
Thread tension too light, too loose.	Readjust tension.
Wrong hook/looper timing.	Reset to standard setting, check loop formation.
Hook/looper point damaged.	Polish hook/looper point or replace with new hook/looper.
Wrong needle bar height.	Reset to standard setting.
Wrong needle system.	Change to correct needle system.
Needle clogged by melted residues.	Replace needle, change to anti-clog finish, and lubricate thread.
Poor thread quality.	Change to quality thread with correct finish.
Sewing thread elongation too high.	Change to thread with lower elongation.
Flagging by highly elastic fabric.	Adjust throat plate needle to fit needle size, use ball point needle.
Wrong needle size.	Change needle size to match thread size.
Throat needle plate hole too big.	Change to throate plate with smaller needle hole.
Poor loop formation due to wrong machine timing.	Reset to standard machine timing.
Flagging of fabric due to poor presser foot contact.	Readjust foot pressure, use special presser foot.
Needle deflection or needle bent.	Reset needle guard, change needle size and replace needle.
Poor loop formation due to thread quality.	Change to thread with lower elongation and better finish.

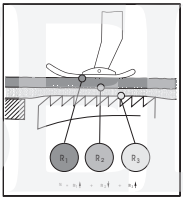
SEAM PUCKERING

Seam puckering is a result of unintentional puckering formed during or after sewing. It's of three types: transportation puckering, displacement puckering and relaxation puckering. To help you grasp the subtle differences, we've dealt with each type of puckering in detail.

TRANSPORTATION PUCKERING

The reason for this is different friction conditions during transport of the fabric. When using a machine with the hopper, transport puckering occurs under the following conditions:

- High friction between feed dog and fabric (R1)
- Low friction between upper and lower fabric (R2)
- High friction between upper fabric and presser foot (R3) R1+R2+R3 = Transportion puckering

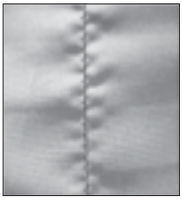


Transportation Puckering

A combination of these three cause transportation puckering. This puckering can be prevented by different measures. For example one can use Teflon coated presser foot to decrease friction between upper and presser foot. Another way out is to use sewing machines with top and drop feed.

DISPLACEMENT PUCKERING

The insertion of the sewing thread in the fabric displaces the yarns near the stitch hole resulting in tension that leads to puckering. The higher the fabric count and the thicker the sewing thread, the higher the chance of puckering.


Displacement Puckering

Proposals that have been made to solve this problem are controversial (use of needles with cutting points) or can only be carried out with additional expenditure (positioning of the seam at an angle of 15 degrees to the warp direction).

RELAXATION PUCKERING

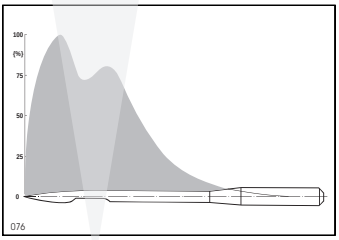
This is limited to seams stitched with every elastic sewing thread and high thread tension. The thread which has been inserted with high tension will pucker after sewing (this may take several hours). Variations in humidity and temperature can also play a role.

Relaxation Puckering

A detailed treatment of the causes of seam puckering and solutions are given below.

CAUSE	RECOMMENDATION
Wrong tension of needle/bobbin thread.	Re-adjust tension of needle/ bobbin thread.
Sewing thread not shrink-free.	Change to better quality thread.
Sewing thread with very high elongation.	Change to thread with lower elongation.
Thread finish not sufficient	Use correctly finished thread.
Needle size too big.	Choose the right needle size.
Throat plate needle hole does not fit needle size.	Change to throat plate with smaller needle hole.
Presser foot pressure too high.	Reduce presser foot pressure.
Machine does not use compound feed.	Use machine with compound feed.

NEEDLE HEATING



Needle heating depends on:

- Fabric (kind of fibre, weave, knitted goods, finish, number of plies, fabric combinations)
- Sewing machine (speed, stitch type)
- Thread (kind of fibre, finish, construction)
- Needle (size, surface, point, shape)
- Environment conditions (humidity)

Under certain conditions the maximum temperature of the needle can reach 450 degrees C. This tempering effect (reduction in hardness, loss of elasticity) can quickly lead to a worthless needle.

The highest needle temperature is usually measured at the eye (exceptions are needles with a conical blade, supplementary shoulder or when sewing a large amount of plies). There is an analogy between the distribution of heat along the needle and the penetration force. The highest temperatures are measured on that part of the needle with the highest penetration force.

CAUSE	RECOMMENDATION
Damage of sewing goods.	Use smaller needle size, reduce needle temperature.
Melted residues on needle surface.	Change to needle with anti-clog surface.
Needle eye clogged.	Use needle with anti-clog surface.
Poor quality thread finish.	Change to quality thread with correct finish.
Poor finish of fabric.	Contact fabric supplier for better finish.
Thread breakage.	Lower machine speed, use thread lubrication or needle cooler.

NEEDLE BREAKAGE

Different needles break at different points due to different stresses. Knowledge of the same will help you save needless energy, time and money. Listed below is a ready reckoner for understanding needle breakage:

Breaks at Scarf (CAE)

Breaks at tip

Breaks at blade

1. Routine breakage: This arises because of buckling stress. A needle invariably breaks at the CAE (Clearance Above Eye) only at the end of its useful life. The sole reason for this is wear and tear.

2. Breakage due to faulty machine setting: If a needle breaks too often at the CAE, it may not be because of the needle quality. In such cases it pays to examine the tip. There's a good chance that the needle would have hit a machine part due to faulty machine setting.

3. Breakage at the blade: If a needle breaks at the blade, it means that the garment has been pulled manually during sewing or that the thread tension is high or that the sewing is over cross seams. All of these make the needle move sideways, thereby leading to bending stress which in turn leads to breakage.

CAUSE	RECOMMENDATION
Bent or damaged needles.	Replace bent or damaged needles.
Wrong needle system.	Use correct needle system for the machine class.
Faulty positioning of hook.	Check exact positioning of the hook, feed dog, loop tacking position.
Faulty cut out of pressure foot and throat plate.	Correct cut out of pressure foot and throat plate.
Mismatch between needle size and thread count.	Check the relationship of the needle size to thread count.
High needle temperature.	Avoid extreme needle heating.
High thread tension.	Avoid too high thread tension.
Sewing across pins.	Avoid sewing across pins.
Lapse in checking of tip smoothness.	Checking of tip smoothness at least every two days.
Needle isn't centered in the needle plate hole.	Adjust the needle bar, slightly indent the needle plate hole.
Bent bobbin.	Change new bobbin.
Too short needle fix screw.	Change the lengthy needle fix screw.

STITCH TYPE SECRETS REVEALED

An understanding of the common stitch formations permits selection of the most appropriate for any particular purpose.

There are two basic stitch formations, lock stitch and chain stitch, with a number of variations in each type.

In all cases the stitch develops from the formation of a loop in the needle thread as the needle rises from its lowest point. This loop is either inter-looped with the preceding loop or inter-looped with other threads carried in loopers in chain stitch, or interlaced with an under thread in lockstitch.

Stitch Types can be divided into six main categories:

Class	100	-	Single Threads Chain Stitch
	200	-	Hand Stitch
	300	-	Lock Stitch
	400	-	Multi-thread Chain Stitch
	500	-	Over-edge Chain Stitch
	600	-	Covering Chains Stitch

CLASS 100 SINGLE THREAD CHAIN STITCH
Stitch Type 101

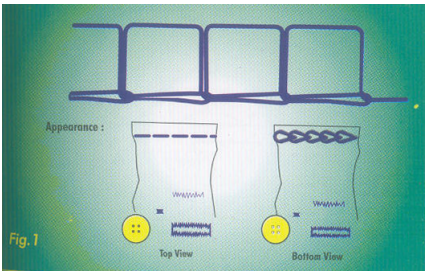


Fig. 1

APPLICATION: Basting, Button Sewing, Bar Tacking, Spot Tacking, Bag Closing, Button Hole & Decorative Stitching.

Single thread chain stitch is used normally when easy withdrawal of the thread is required (e.g. Basting). Since the stitch can so easily come undone, it is essential to leave an adequate length of thread at the end of the stitch formation to prevent running back. This can happen very readily if a smooth extensible thread is used, such as a continuous filament or more so with a non filament.

Stitch Type 103

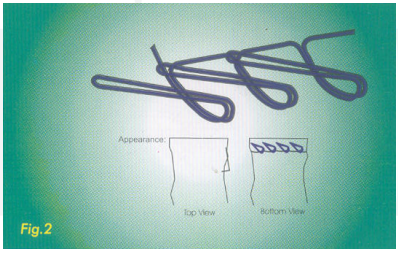


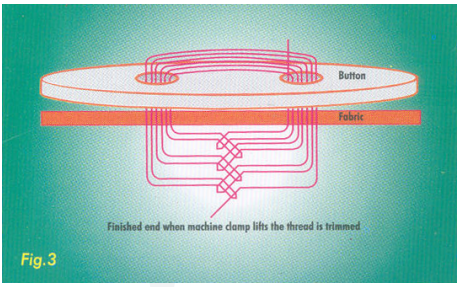
Fig.2

APPLICATION: Hemmings, Belt Loops, Padding Operations & Felling.

This stitch formation is commonly known as a single thread blind hemming or felling stitch. It is produced using a curved needle, which passes left to right through a single or double (hem) folded piece of material, entering and leaving from the same side of the fabric, carrying a needle thread which is intercepted by a blind looper as it exits the fabric on the right hand stroke. This thread is then carried right to left, back to the needle and interlooped prior to needle penetration.

While the needle fully penetrates the inside single or double hem, the other fabric is only partially for a portion of its thickness. As the term "blind hemming" implies, the opposing side to the penetrated seam should show no evidence of a stitching line.

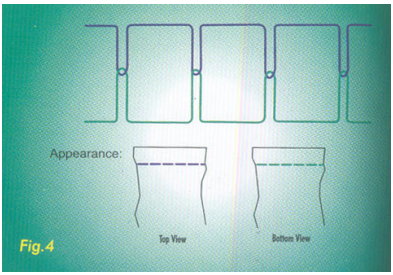
Stitch Type 104



APPLICATION: Button Sewing, Snap Fastners & Trouser Cuff Tacks.

This stitch formation is widely used for attaching buttons, snap fasteners, trouser cuff tacks, etc. Normally these machines have a fixed cycle of stitches. A selection of 8, 16, or 32 stitches is most common, with 2 or 3 typing stitches at the end of the cycle to prevent unraveling of the stitch formation, the selected number dependant on the type and size of button (2 or 4 hole, flat or shank) and principally dependant on the type and weight of garment. While 16 stitches would be adequate for a shirt or blouse 18/ 20 ligne button, you would need 32 stitches to secure a 50 ligne button to a trench coat. (40 ligne = 25mm diameter approx).

CLASS 300 LOCKSTITCH
Stitch Type 301



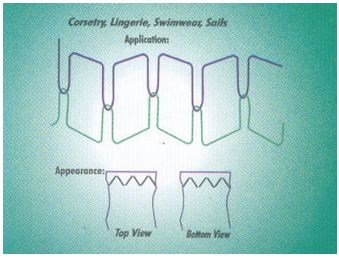
APPLICATION: Run Stitching & Top Stitching.

Lockstitch is formed by two threads - a needle thread and an under-thread which interlace between the plies of fabric being sewn.

This stitch is used if the same appearance is required on both sides of the fabric and if a very secure stitch is required. The sewing action involved is the most severe on the thread since it reciprocates a number of times through the needle eye as each stitch is formed. The number depends on the stitch rating selected. At 10 spi (12 stitches per 3 cm) for instance, any one spot on the thread passes through the needle eye some 38 times before being set in the fabric.

This stitch is produced by the needle thread loop formed on the underside of the fabric being enlarged by a hook and passed around the bobbin thread. The needle thread is then pulled tight by the thread take-up mechanism. The hook and base assembly can be mounted either horizontally or vertically.

Stitch Type 304



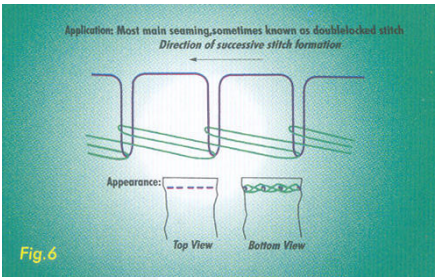
APPLICATION: Corsetry, Lingerie, Swimwear & Sails.

It is sometimes necessary to provide extensible seams using lockstitch and this variation in which successive single stitches form a symmetrical zigzag pattern, is used to achieve them.

Other variants provide a number of stitches in each direction to form two or three point zigzag stitches. The two point variant is Stitch Type 308. And the three point variant is Stitch Type 322.

CLASS 400 MULTI THREAD CHAINSTITCH

Stitch Type 401



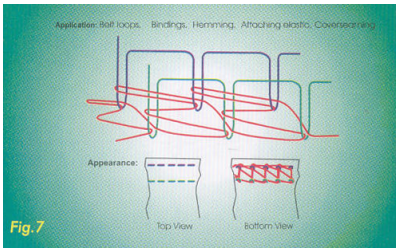
APPLICATION: Most main seaming, sometimes known as double locked stitch.

This two thread chain stitch formation is used for seams where elasticity, strength and continuous sewing are required, e.g. Jeans.

It is formed by two threads, one used in the needle and the other, an under thread carried in a looper. This stitch is formed by the needle thread being interlooped with the under thread. This stitch produces a very strong seam with some extensibility.

As in all chain stitch formations, two thread chain stitch construction seams should be secured at the seam end, via stitch condense, tacking or inclusion into another seam to eliminate the danger of running back or unraveling of the two threads.

Stitch Type 406

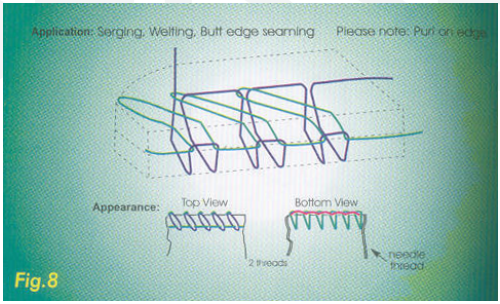


APPLICATION: Belt loops, bindings, hemming, attaching elastic & cover seaming.

This is one of the commonest of the multi-thread chain stitches constructions, used principally in sports wear, leisure wear, and interlock garments where a high degree of strength and extensibility is required. It is commonly referred to as "two needle bottom cover-stitch." It involves two needle threads which are interlooped with one looper thread. Threads with good loop forming properties are essential for reliable continuous performance.

Stitch Type 407 is a variation of Stitch Type 406 and involves three needle threads and one looper thread. Referred to as "thread needle bottom cover-stitch."

CLASS 500 COVER SEAMING STITCH
Stitch Type 503

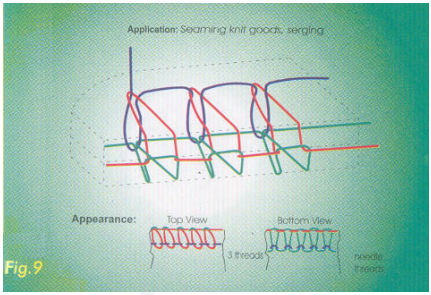


APPLICATION: Serging, Welting & Butt edge seaming.

Over-edging as the name implies involves one or more threads passed around the edge of the material being sewn to neaten it and prevent it from fraying.

This stitch type utilizes one needle thread and one looper thread which are interlooped at the point of needle insertion and on the fabric edge- the needle thread loop being extended across to achieve this. This stitch is used mainly for over edging single ply panels of fabric (serging) before they are joined together. It is not suitable for seaming.

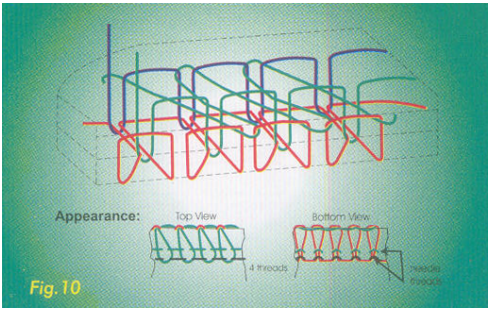
Stitch Type 504



APPLICATION: Seaming knit goods & Serging.

In this case one needle thread and two looper threads are involved. The needle thread interloops with both looper threads which themselves interloop with each other at the fabric edge. This stitch provides a strong but highly extensible joining and is thus commonly used for knitted and woven fabrics.

Stitch Type 514



APPLICATION: Seaming stitch (produces strong seams on woven or knits).

Similar to Stitch Type 504 with the addition of a second needle thread. The second needle penetrates between the first needle stitching line and the fabric edge. The second needle interloops with both looper threads reinforcing the first needle stitching line for greater seam strength on knitted and woven materials.

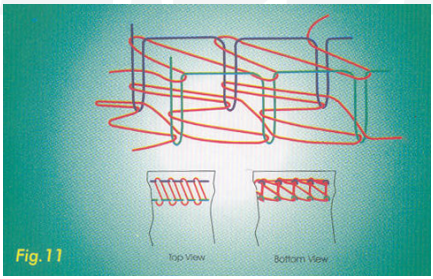
This stitch is used more frequently to join up low stretch fabrics and in tailoring, sometimes referred to as "seam and serge." Perhaps more correctly that name should be applied to Stitch Type 515 which can be used as a means of achieving similar effect at a lower cost (one thread fewer)

Stitch Type 516
APPLICATION: Safety stitch.

This stitch consists of a row of Stitch Type 401double lock chain stitch coupled with Stitch Type 504 three thread overlock produced simultaneously.

CLASS 600 COVER SEAMING STITCH

Stitch Type 602



APPLICATION: Binding & Attaching Elastic.

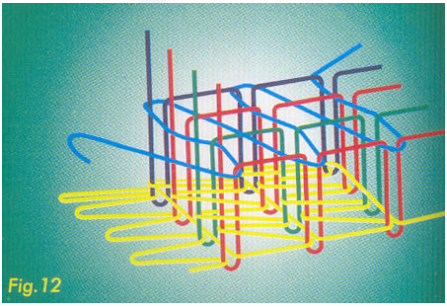
Stitch Type 602 is a development of Stitch Type 406, where an additional thread is interlaced between the two needles, providing a top cover stitch on the surface of the fabric. It is commonly referred to as "two needle top and bottom cover stitch".

Stitch Type 605

APPLICATION: Binding & Attaching Elastic & for decorative purposes.

Stitch Type 605 is again a development of Stitch Type 407 where an additional thread is interlaced across all three needles providing a top cover on the surface of the fabric. It's often referred to as "three needle top and bottom cover stitch".

Stitch Type 607



APPLICATION: Interlock Garments, Underwear, Swimwear & Ladies Briefs.

This flat seam or flat locking stitch is a four needle chain stitch cover stitch. Whilst other variants exist with additional top cover threads and minor variations to the top cover pattern, Stitch Type 607 is used.

It consists of four needle threads, one looper thread and one top cover thread. It is commonly used in interlock garments, underwear, swimwear etc where a flat butt seam (edge to edge), or overlapping the fabric within the width of the outside needles, is required.

This produces a strong extensible seam, almost invisible through outer garments, which makes this seam construction ideal for ladies underwear. Normally used with left and right hand fabric trimmers to guarantee accuracy of the butt seam or overlap joint.

INSIDER INFORMATION ON NEEDLE SIZES, POINT STYLES & APPLICATIONS

What's the right needle to use for sewing leather, tencel, knitwear, elastic, woven, coated and laminated materials? What's the basis for choosing them? Should the same sized needle be used for light and heavy fabrics? Find all the answers from the guide below.

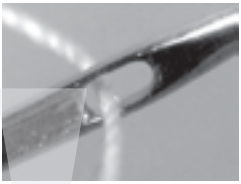
MATERIAL	NEEDLE	SIZE	POINT STYLE
WOVEN FABRIC			
Light (shirt/blouse material)	65-75	9-11	Normal Round Point/R Point/ Set Point
Medium (suit material)	80-90	12-14	Fine Ball Point/ SES Point/ L Ball Point
Heavy (coat material)	100-110	16-18	As above
Denim: Light	70-90	10-14	As above
Medium	100-110	16-18	Medium Ball Point/SUK
Heavy	110-140	18-22	Fine Ball Point/ SES Point/ L Set Point
VERY DENSELY WOVEN MATERIALS			
Light (silk, artificial silk)	65-70	9-10	Fine Ball Point/ SES Point/L Set Point
	65-70	9-10	Acute Round Point/ SPI Point / S Set Point
Medium (e.g. tarpaulins)	100-180	16-24	As above
Heavy	200-330	25-30	As above
KNITWEAR			
Fine	60	8	Medium Ball Point/ SUK
Medium	65-75	9-11	Fine Ball Point/SES Point/L Ball Point
Coarse	75-90	11-14	Medium Ball Point/ SUK
Very coarse	75-90	11-14	Heavy Ball Point/ SKF Point
ELASTIC MATERIALS (ELASTAN, LYCRA ETC)			
Fine	65-70	9-10	Heavy Ball Point/SKF Point
Medium (particularly bandages)	80-90	12-14	Special Ball Point/SKL Point
Coarse	80-90	12-14	As above
Non-covered elastometric threads (e.g. elastic for waistband)	65-90	9-14	Acute Round Point/SPI Point/ S Set Point
COMPOSITE MATERIALS	65-80	9-12	Acute Round Point/SPI Point/ S Set Point

MATERIAL	NEEDLE	SIZE	POINT STYLE
Woven fabrics/knitwear combined with an inlay(e.g. shirt manufacture seams for cuffs, collars) Coated materials combined with woven fabrics/knitwear (e.g. Goretex, Sympatex, Helsapor)			
Fine	65-70	9-10	Acute Round Point/SPI Point/ S Set Point
Medium	80-90	12-14	As above
Coarse	80-90	12-14	As above
LAMINATED MATERIALS			
Textile/textile (car seat covers, wetsuits/ diving suits)	80-110	12-18	Fine Ball Point/ SES Point/ L Ball Point
Textile/cardboard, textile/ plastic, very rigid	140	16-22	Normal Round Point/ R Point/ Set Point
Cupboard/plastic (e.g. Car seat tracks)	100-140	16-22	Cutting Point/ SDI Point
	80-130	12-21	Cutting Point/DH Point
Coated materials (e.g. tarpaulins)	00-180	16-24	Acute Round Point/SPI Point/ S Set Point
Medium	200-330	25-30	As above
Heavy	200-330	25-30	Cutting Point/SDI Point
Films	65-90	9-14	Normal Round Point/ R Point/ Set Point
MATERIAL COMBINATIONS			
Leather with textile	80-100	12-16	Normal Round Point/ R Point/ Set Point
Manufacture of Furs and Skins	80-100	12-16	Normal Round Point/ R Point/ Set Point

VERY USEFUL

YARN ON

THREAD SIZES



The width of the eye of a needle is normally 40% of the size of the needle. The thread must occupy no more than 60% of the width of the eye so that there is no risk of fraying of thread during sewing and the thread flows smoothly during operation. The table attached gives a general guide to matching thread and needle size.

APPAREL												
Needle	65	70	75	80	90	100	110	120	125	130	140	160
Size	(9)	(10)	(11)	(12)	(14)	(16)	(18)	(19)	(20)	(21)	(22)	(23)
Spun	180,160	180,160	180,160	140,120	120,100	120,100	75	50,36	50,36	50,36	36	
Core spun	140	140, 120	140,120	75			25	25	25	25		
Textured												
Continuous	220	220	220	220								
Filament												
SHOE AND LEATHER												
Bonded	--	-	-	80	80,60	60,40	40,20	40,20	40,20	20	20,13	13
Nylon												
Core Spun	--	-	-	75	75,50	50,36	36,25	25	25,20	20	20	20

THE A TO Z OF NEEDLE SYSTEMS

LOCK STITCH NEEDLE GROUP

Shank DIA =1.63mm
Butt to eye length = 33.9mm
System = DBX1, DBXK5, DBX95, DBX257, DBX1738, 16X257, 16X231, 16X95, 1738, 287WH

Shank DIA = 2.00mm
Butt to eye length = 33.9mm
System = DPX5, DPX17, DPX134 135X5, 135X7, 134, 797

Shank DIA = 2.00mm
Butt to eye length = 38.9mm
System = DPX17, 135X17

Shank DIA = 2.00mm
Butt to eye length = 38.1mm
System = DPX35 R, 134-35, 2134-35

Shank DIA = 1.63mm
Butt to eye length = 29.6mm
System = DAX1, DAX9, 88X1, 88X9, 1128

Shank DIA = 1.83mm
Butt to eye length = 34.1mm
System = UOX180G, DB-A27, UY180GYS

Shank DIA = 1.63mm
Butt to eye length = 33.9mm
System = DBX287 WKH, 287WKH

ZIG ZAG NEEDLE GROUP

Shank DIA = 2.00mm
Butt to eye length =33.9 mm
System = SGX1906, 135X35

Shank DIA = 2.00mm
Butt to eye length = 33.9 mm
System = DPX2655, 265-5, 438-5

Shank DIA = 2.00mm
Butt to eye length = 33.9 mm
System = DPX265, 265-50 EO, 438-80 EO

OVERLOCK NEEDLE GROUP

Shank DIA = 2.02mm
Butt to eye length =28.6 mm
System = DCX27, DCX1, DCXN 17, RMX27, B27, B 27 B, 81X1, 621, MY1023A, 1886, UY3027GS, 42322

Shank DIA = 2.02mm
Butt to eye length =28.6 mm
System = DCX5, RMX29, B29, B29B, 81X5, UY3029 GS

Shank DIA = 2.02mm
Butt to eye length =28.6 mm
System = DMX13, 82X11, 1886 KK

Shank DIA = 1.22mm
Butt to eye length = 28.6 mm
System = DCX3

Shank DIA = 1.63mm
Butt to eye length = 33.9 mm
System = M/c 14 U, Baby Lock

CHAIN STITCH NEEDLE GROUP

Shank DIA = 2.00mm
Butt to eye length =37.0mm
System = TVX7, 149X7, MY1002A

Shank DIA = 2.00mm
Butt to eye length = 38.9mm
System = TVX3, DVXG9,
UY 128 GAS, 149X3, MY1044, 1280

Shank DIA = 2.00mm
Butt to eye length = 47.2mm
System = TVX5, 149X5

Shank DIA = 2.00mm
Butt to eye length =38.6 mm
System = DVX57, 62X57, 5640

Shank DIA = 2.00mm
Butt to eye length = 41.4 mm
System = DVX59, 62X59

Shank DIA = 2.00mm
Butt to eye length = 38.9 mm
System = DVX63, B63

Shank DIA = 2.00mm
Butt to eye length = 36.6 mm
System = TVX64, B64

Shank DIA = 2.00mm
Butt to eye length = 38.9 mm
System = DVX1, UYX121, 62X21,
UY121GS, 759, MY1001, 1628

Shank DIA = 2.00mm
Butt to eye length =38.9 mm
System = DVX43, 62X43

Shank DIA = 2.00mm
Butt to eye length = 38.9 mm
System = FLX118A, UY118GAS

BUTTON SEWING NEEDLE GROUP

Shank DIA = 1.75 mm
Butt to eye length = 37.1 mm
System = TQX1, TQX5, 175X1,
175X5, 1985

Shank DIA = 1.63 mm
Butt to eye length =37.3 mm
System = BQ X1, 108X1, 108X3

Shank DIA = 1.75 mm
Butt to eye length = 41.2 mm
System = TQX3, 173X3, 2018

Shank DIA = 1.75 mm
Butt to eye length = 47.0 mm
System = TQX9, 175X9

Shank DIA = 1.75 mm
Butt to eye length = 47.0 mm
System = TQX7, 175X7, 2091

Shank DIA = 2.00 mm
Butt to eye length = 38.1 mm
System = DPX35K, 134-35K

Shank DIA = 2.00 mm
Butt to eye length = 44.5 mm
System = MT190K, 190K

Shank DIA = 1.75 mm
Butt to eye length = 47.0 mm
System = TQXN14, 2091KK

BLIND STITCH AND FELLING NEEDLE GROUP

Shank DIA = 2.02 mm
System = LWX5T, 251LG, 300, 29 CB, 29-C-300 LG

Shank DIA = 2.02 mm
System = LWX3T, LWX4T, 251, 29CA, 29-C-300, 1715F

Shank DIA = 2.02 mm
System = LWX2T, LWX6T, 29 BL, 29BG, 29-34, 29-49, 2140 TP

Shank DIA = 2.02 mm
System = LWX1669 E, 369=69 E, 1669 E, 2969 E, 1715 E

Shank DIA = 2.02 mm
System = LWXC5, 29 BD, 29-13

Shank DIA = 2.02 mm
System = LWX1T, 29 BC, 29-12

Shank DIA = 2.02 mm
System = LWX7T, 29 BB, 29-6, 29-63, 1717 DC, 1828 E

Shank DIA = 2.03mm
Butt to eye length = 33.9 mm
System = 130 N, 130 MET,
130-705H, 15X1, HAX1
130-705H-J
130-705H-LL
130-705H-LR
130-705H-M
130-705H-Q
130-705H-S
130-705H-SUK
130-705H-E

TWIN NEEDLES
System = 130-705H-E ZWI NE 2.0
130-705H-E ZWI NE 3.0
130-705H-S ZWI NE 2.5
130-705H-S ZWI NE 3.0
130-705H-S ZWI NE 4.0
130-705H-J ZWI NE 4.0
130-705H- ZWII NE 6.0
130-705H- ZWII NE 2.0
130-705H- ZWII NE 2.5
130-705H- ZWII NE 3.0
130-705H- ZWII NE 4.0
130-705H-B RNE 6.0
130-705H-B RNE 8.0

TRIPLE NEEDLES
System = 130-705H-DRI NE 3.0

WING NEEDLES
System = 130-705H-WING
130-705H-ZWIHO

NEEDLE GROUP FOR LEATHER

CLASSIFICATION	POINT STYLES
PF X 134 P	NW (Narrow Wedge) P, Ps
PF X 134 KS	NCR (Narrow Cross) S, Ss
PF X M34 LL	TW (Twist) LL, Lls
PF X 134 LR	RTW (Reverse Twist) LR, Lrs
MT X 134 PCL	NW (Narrow Wedge) P, Ps
MT X 134 PCR	NW (Narrow Wedge) P, Ps
MT X 134 L	TW (Twist) LL, Ls
PF X 34 P	NW (Narrow Wedge) P, Ps
TF X 2	TW (Twist) LL, Lls
TF X 2 LR	RTW (Reverse Twist) LR, Lrs

CLASSIFICATION	POINT STYLES
TF X 4	NW (Narrow Wedge) P, Ps
TT X 6	NW (Narrow Wedge) P, Ps
R TW	(Reverse Twist) LR, Lrs
DP X 16	NW (Narrow Wedge) P, Ps
DP X 16 LR	R TW (Reverse Twist) LR, Lrs
DP X 16 D	TRI (Triangular) D
DP X 35 P	NW (Narrow Wedge) P, Ps
DP X 35 LR	R TW (Reverse Twist) LR, Lrs
DI X 4	TW (Twist) LL, LIs
DI X 4 LR	R TW (Reverse Twist) LR, Lrs
DD X 2	TW (Twist) LL, LIs
DD X 2 LR	R TW (Reverse Twist) LR, Lrs

THE THINGS YOU CAN DO WITH THREADS

THREAD	TICKET/TEX. NO.	TYPICAL APPLICATION
Polyester	Tkt 18-120	Fine - Serging and over edging,
		general seaming of lingerie,
Cotton Corespun (Soft)	(Tex 18-25)	blouses, shirts.
	Tkt 75 (Tex 40)	Medium - Jeans, gloves, general seaming
		of knitwear, woven apparel
	Tkt 50-36	Heavy - Jeans, work wear, heavy clothing
		button holing, decorative
	(Tex 60-85)	stitching, industrial gloves.
	Tkt 25 (Tex 120)	Extra Heavy - Jeans, protective clothing.
Polyester	Tkt 75 - 50	Medium - Leather goods and
		garments, protective gloves,
Cotton Corespun (Glace)	(Tex 40 - 60)	leather footwear, mattresses, tents,
		luggage, book binding
	Tkt 36 - 15	Heavy and Extra Heavy -
		Luggage, saddlery, leather goods,
	(Tex 85 - 200)	mattresses, tents, canvas and
		tarpaulins, protective boots.
Spun Polyester	Tkt 120	Fine - Serging and overedging, general
	(Tex 25)	seaming of lingerie, fine knitwear,
		shirts and blouses.
	Tkt 100 - 80	Medium - General seaming of lingerie,
		under wear, knitwear, shirts,
	(Tex 30 - 35)	blouses, dresses, outerwear,
		quilts, gloves, swim wear,
		foundation garments, work wear,
		industrial gloves,
		button holing, button sewing.
	Tkt 60 - 30	Heavy - Jeans, work wear,
		decorative stitching, button sewing,
	(Tex 50 - 100)	button holing, industrial gloves,
		bag closing, piece end joining.

THREAD	TICKET / TEX. NO.	TYPICAL APPLICATION
Continuous Filament	Tkt 120	Fine - Quilting, sail hemming, gloves, light
Nylon 6.6	(Tex 25)	weight clothing, book binding,
	Tkt 80 - 40	Medium - shoes, leather goods, heavy gloves, protective clothing,
	(Tex 35 – 75)	mattresses, glags, filter cloths, upholstery (including automotive)
	Tkt 30 - 10 (Tex 100- 300)	Heavy - Decorative stitching, heavy foot wear, golf bags, upholstery (including automotive) safety belts.
Continuous Filament Polyester	Tkt 180 -120 (Tex 18 - 25)	Fine - Zip stitching.
	Tkt 60 - 10 (Tex 50 - 300)	Medium & Heavy - Footwear, leather goods, luggage, mattresses, upholstery (including automotive)
Continuous Filament Polyester- textures	Tkt 180 -120 (Tex 18 - 25)	Fine – Under threads for lightweight chain stitch sewing.
Mercerised Cotton	Tkt 50	Medium – General seaming of shirts, blouses, dresses,
	(Tex 36)	over dyed garments.
Viscose Rayon	Tkt 27	Computerised multi-head embroidery, monogramming.
Trilobal Polyester	Tkt 27	Computerised multi-head embroidery, monogramming.
Aromative Polyamide	Tkt 40	Protective / fire resistant clothing, space suits,
	(Tex 75)	combat wear, civil aircraft upholstery.

WHERE TO GET THE FINEST NEEDLES AT A VERY FINE PRICE

By now, you know all that is to be known about good needles. The only thing you perhaps don't know is where to get them. Allow us to let you in on one final secret: If you want good needles at a great price, just visit beisselneedles.com

WHAT'S BEISSEL?

Beissel is a global brand of needles that aspires to bridge the exacting new age demands of the fashion industry with old fashioned precision.

Licensed from BMN Beissel Maschinennadel GmbH, the Beissel trademark is a symbol of class borne by needles made lovingly by over 200 passionate experts in our 80,000 square foot factory, located in Southern India.

For over a decade now, Beissel has been providing nearly 500 readymade stitching solutions to the who's who of the fashion industry. An eye for detail, delicious pricing and above all, our fashion conscious approach has made us a hot favourite with haberdashers, designers and apparel makers across the globe.

WHO'S BEHIND BEISSEL?

Altek Beissel Needles Limited is the only needle company in the world to manufacture 100% of its needles under the ISO 9002 Quality system. We were the first in the world to pass the performance standards laid down for sewing machine needles by SATRA of the UK. We use the same technology and processes as the now legendary Lammertz of Germany. Every single needle made in our state-of-the-art factory in Chennai, goes through 155 different quality checks. We have almost 200 specialists working round-the-clock to ensure that nothing but the best reaches our clients.

Altek Beissel makes needles for every conceivable need in the industrial and domestic sewing segments.

Our product catalogue and price list is available on the Beissel web site. To place orders directly with the company use the website. Delivery will be made directly from the branches or from the Head Office, whichever is convenient.

BEISSEL

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