Contents

Introduction

The Volume 2 in the Quality Assurance Handbook is divided in Sections. Each Lindström Group Product Category has its own Section. This Section 2.1 explains the specific instructions for Product Category: Work Wear (WWS).

This part relates to what is included and what shall be used as support and reference material during the manufacturing process to ensure that all Lindström Group standards and expectations are met.

1. Definitions

Below are defined the main terms used in this Quality Assurance Handbook Section 2.1: Product Category: Work Wear

1.1. Definition of Co-operation forms

Lindström applies three different concepts of co-operation with his suppliers, CM, CMT and FP.

1.1.1. CM

In co-operation concept CM (Cutting and Manufacturing) Lindström buys cutting and manufacturing service from Garment Supplier. Lindström provides the garments supplier with all fabrics and accessories/trims.

1.1.2. CMT

In co-operation concept CMT (Cutting, Manufacturing and Trims) Garment Supplier purchases the accessories/trims from sources given my Lindström. Lindström provides the supplier with fabrics.

1.1.3. FP

In co-operation concept FP (full package) the Garment Supplier purchases both fabrics and accessories from suppliers given by Lindström.

1.2. Definitions of Samples

1.2.1. Approval Sample

The Approval Sample is manufactured by the sample manufacturer. The Approval sample is used to verify that the garment can be produced according to given instructions, Tech Pack and/or other specification. In case of customized garment the customer shall accept the Approval Sample.

1.2.2. Counter Sample

The Garment Supplier shall produce a Counter Sample corresponding to the Approval Sample. The approved Counter sample shall be stamped and dated and it is to be used as the Reference sample in Quality Control of future deliveries.

1.2.3. Production Sample

The Production Sample is taken from the running production of the Garment Supplier and it is used to verify that the garment is produced as agreed and in accordance with given instructions and the accepted Counter sample.

2. Compliance Guidelines

All products supplied to Lindström shall conform to all international and national laws and standards, EN, GOST-R, etc., applicable in countries Lindström is offering his services. Whenever a product is aimed to be sold only on a certain geographical area the Supplier is informed about special requirements, if any.

In deliveries to the European Economic Area (EEA) the Supplier shall keep himself aware of the European Union REACH directive and keep himself updated about the list: Restriction of the use of certain hazardous substances (RoHS). The Supplier shall pay special attention to that the regulations in REACH are strictly followed during the entire production process.

The National Regulations for Russian Federation and EAEU Countries is found in Volume 1 of the Quality Assurance Handbook.

The standards for labeling on respective Lindström Group market shall be followed for

1. Fiber composition labelling
2. Country of origin labelling

as specified in detail in point 4.9.

3. Fabrics and Accessories

This Part relates to guidelines for Lindström Group requirements in terms of quality and functionality of fabrics and accessories, including the fabric test requirements.

All suppliers should read this part and be familiar with our requirements prior to making a submission for a tender.

The part contains:
• General requirements
• Fabric-specific quality requirements
• Accessories quality requirements
• Testing requirements.

The quality of all fabrics and accessories used in Lindström garments must meet all stated Lindström quality standards. In a situation where a quality issue arises, either from customer returns or as identified by Lindström before bulk garments are delivered to our Central Warehouse or to our Business Unit, Lindström may require the Supplier to have further testing carried out. All testing is at the Supplier's expense.

3.1. Fabric Specific Requirements

At Lindström different kinds of fabric are used in garments. The fabrics are divided into two main categories, woven and knitted. The minimum values of the required tests for fabrics that reach Lindström quality level are shown in the Supporting material. International standards are mentioned for each required test the fabrics shall comply with requirements of Öko-Tex Standard 100 and REACH regulations.

3.1.1. Woven Fabrics

The fabric shall be suitable for industrial wash and drying as defined in ISO 15797. ISO 30023 defines the symbols for testing suitability of work wear for industrial wash.

When selecting colors the fabric manufacturer shall give preference to PES dyed with dispersed dyestuffs and CO dyed vat dyestuffs in accordance with best practice.
For white fabrics, optical brighteners shall maintain their properties during at least 50 washes. For white fabrics chlorine retention for color change shall be avoided.

In case of sensitive and/or critical color combinations in a garment, separate assessment is needed.

3.1.2. Knitted Fabrics

Knitted fabrics shall be suitable for industrial wash and appropriate drying process (e.g. tumbler or finisher) reference being the process mentioned in ISO 15797. Specifications of knits shall include a grading system for defects. The torsion/twisting angle shall not exceed a 5 % deviation.

Uses of a garment for specific purpose influence the requirements on the fabric. Usability of materials e.g. for fire resistant, high visible, ESD (Electrostatic Discharge) and clean room garments shall be especially tested. Lindström defines separately the needed tests case by case for these specific purposes.

3.1.3. Fabrics for Patient Wear

The fabrics for Patient Wear used in garments for patients in hospitals and in homes for elderly people.
The fabric shall be suitable for industrial wash and drying according to standard given on material specification for each fabric. The fabric shall comply with requirements of Öko-Tex Standard 100, chlorine retention for color change shall be avoided, and different types of dyes with inferior fastness are not allowed for color adjustment.

The amount of formaldehyde in the bed textiles and garments is restricted by the legislation.

Maximum amounts of formaldehyde in textiles and garments imported are as follows:

	Allowed amount of formaldehyde
1 Textiles for patients/Children	30 mg/kg
2 Textiles that have skin contact	100 mg/kg
3 Other textiles	300 mg/kg

Supporting Material

2.1 - 3.1.2_1 Minimum values for fabrics that contain 50 % or more polyester

2.1 - 3.1.2_2 Minimum values for fabrics that contain less than 50 % PES.

2.1 - 3.1.2_3 Minimum values for 100 % cotton fabrics.

2.1 - 3.1.3_4 Minimum values for knitted cloths

3.2. Quality Requirements for Accessories

All accessories used in the garments shall meet with Lindström standards.
Lindström tests and selects new trims when a new trim is required. The source for the trims is given to the CM/CMT Garment Supplier, who does the purchasing of them. Lindström has the right to demand invoices on trims from the Garment Supplier to check that agreed trims have been purchased and used.

No other accessories than those mentioned in the Tech Pack or in any other by Lindström provided written document shall be used.

Visual approval only

Lindström approval reports will approve fabrics and accessories from a visual aspect only.
If a performance issue on an approval sample is obvious to Lindström the Supplier will be advised to amend the issue via our approval report.

3.3. Testing and Inspection of Fabrics and Accessories

3.3.1. Testing of Fabrics and Accessories

The Suppliers of various materials are aware of Lindström standards and familiar with what types of tests are to be conducted for the required standards.

In CM and CMT based contracting Lindström is responsible for testing new fabrics to ensure that they meet with set requirements. In FP based contracting the supplier is responsible for testing of fabrics by an authorized testing company to ensure exact matching to Lindström requirements.

Lindström may request fabric and accessories to be tested by a third party to the performance levels stated in this document. If the fabric or the accessories do not meet Lindström standards, the supplier will be charged for testing costs and may be penalized.

3.3.2. Supplier responsibilities

It is the Supplier's responsibility to inspect and when necessary test fabrics, accessories, components and labels as stated above.

All required testing must be carried out prior to submission of the item for approval. Suppliers must submit the lab test reports and required certificates at the same time as the item is submitted for approval – where Lindström specifically requests testing to be done, Lindström will not approve the item if the lab test report does not accompany the sample. The item will not be taken in use before Lindström has accepted the documentation.

The lab test reports and certificates shall be sent scanned to Lindström. The supplier shall present the original documents to Lindström when requested.

3.3.3. Tests and Testing Laboratories

The selected properties of the various fabrics shall be tested according to given instructions in the supporting material mentioned below.

For all fabric tests conducted in the various countries the nominated suppliers are noted in the Supporting material mentioned below.

3.3.4. Inspection of fabrics

Inspection of fabrics shall be carried out at two points of the supply chain. The first inspection point shall be carried out at the mill of manufacturer of the fabric. This inspection is comprehensive and shall be carried out as described in 3.3.4.1.
The second inspection of the fabric shall be carried out at the garment manufacturer to ensure that the fabric used in Lindström garments corresponds to what is written in the Tech Packs and other documentation delivered by Lindström. The garment manufacturer is responsible for this inspection as described in 3.3.4.2.

3.3.4.1. Inspection of Fabrics at Manufacturer of Fabrics

Both greige and finished fabrics shall be inspected up to 100%.

Finished fabric inspection shall be conducted using the Four Point Grading System, used by major Textile Manufacturers. Defects are assigned penalty points based on their size. Their number, related to the length of the fabric inspected, establishes the grade of fabric quality.

The system penalizes all defects which cause reject garments under specified visual observation encompassing, inspection speed, lighting and viewing position.

Defects in both warp and weft directions are assigned penalty points by the following scale:

1 point minor defect	-	for defects up to 7. 5 cm.
2 point minor defect	-	for defects 7.5 1 cm to 15cm
3 point major defect	-	for defects 15.1 cm to 22.5 cm
4 point major defect	-	for defects over 22.5 cm

The acceptable level of First Quality in goods is following:

	Points per 100 linear meters	Points per 100 square meters
Maximum / Piece	40	26

Repeating major defects over two meters in cloth length shall be removed from fabric during inspection.
Repeating minor defects numbering more than 25 per 100 linear meters are not allowed in First Quality fabric.

Goods exceeding this standard are classified Second Quality.

The fabric shall be inspected on the face side. Inspection machines are run with a tension control system, thus avoiding any tension variance and measurement discrepancies between actual roll length and ticketed length.

The shade of the fabric shall match with the approved original stamped sample.
Inspection measuring machines shall be controlled weekly using a standard calibrated master roll.
Fabric roll information tickets shall be attached on each roll of fabric. The ticket, inspected by ----- indicates the inspector who has examined the roll.

The inspection report shall be submitted to contact person at Lindström or at Lindström nominated supplier immediately after the inspection has been completed and always prior the dispatch to given delivery address. Unless otherwise agreed, no Second Quality goods are accepted.

3.3.4.2. Inspection of Fabrics at Garment Manufacturer

The garment manufacturer shall carry out a quality control for received fabrics rolls as described in Volume 1 of this handbook, section 5: Inspection to AQL standard.
The Garment Supplier shall whenever possible inspect the delivered batch of fabric on a light board.

In the Quality Inspection special attention shall be paid to:

- Holes
- Shade
- Mis-weave
- Cuts
- Yarn distortions

The shade of the fabric shall be compared with the sample of the original fabric supplied by Lindström to the Garment Supplier. The original fabric sample shall be stored in a dark and dry place easily available for shade control of arrived fabrics.

3.3.5. General: Accessories

Trims used in Lindström garments are e.g.: sewing threads, labels, zippers, buttons, snap buttons, velcros, bands, cords, buckles, waddings.

Inspection of Accessories

A check list for inspecting trims at arrival:

1	Checking trim type

2	Checking correctnes of color
3	Checking correctness of quantity
4	Checking overall appearance

The Garment Supplier shall store the trims in a clean and dry place. Stock shall be run according to the principle of first in, first out (FIFO).

3.4. Pattern management

The pattern making is conducted and provided by Lindström or his partners and subcontractors.

The Lindstrom pattern department provide the general level of patterns. Garment supplier is obligated to modify Lindström's pattern data according to his own needs.
The pattern information is delivered as digital pattern data. Digital pattern data is delivered in Gerber /.TMP file format by e-mail or web services. Also, Pattern data can be delivered in DXF/RUL – export format.

Data on digital pattern files shall be strictly followed by the Garment Supplier. Garment supplier is obligated to keep his pattern software and plotting hardware calibrated to match the measures.

Lindström shall be informed about updates of Garment Suppliers software systems concerning handling digital pattern data.

Garment Supplier is obliged to inform Lindström of any deviation or defect revealed on pattern information. Correcting or amending of the pattern is essential before starting the production.

The measurements on Lindström's documents are according to metric system. The abbreviation for size code of letter sizing on Lindström's documentation is without letter X, for example: 4XL is 4L.

Document for instructions for calculating the average consumption of fabric and marker efficiency is delivered on request Garment Supplier.

The quality control shall in first hand be done by comparing the labeled counter/reference sample to samples from production. The documented manufacturing instructions provided by Lindström shall be turned to if some deviations are found. The provided documents shall be valid in following sequence: Pattern, Tech Pack, Other instructions.

The soft copies shall be stored in a secured database with a back-up system in order to secure availability in failure in IT systems. The paper patterns shall be stored in a safe and dry place at the garment manufacturer. Lindström patterns shall be kept separate from patterns from other customers of garment manufacturer.

The patterns are the intellectual property of Lindström and they shall not be used for any other purpose than what has been agreed upon in the Contract between the garment manufacturer and Lindström.

3.5. Sample Management

The samples needed for quality assurance as they are defined in paragraph 1.2 shall be managed as described in this paragraph. Handling of all sample types are described in detail in respective documents of Service and Product Concepts.

Supporting Material:
I2.1 - 3.5_1 Inspection List of Sample

3.5.1. Approval Sample

The Approval Samples shall be test washed to verify that all materials used in it fulfill the Lindström standards. Minimum 3 pcs shall be produced of the Approval Sample. When approved the original Approval Sample shall remain at Service & Product Concepts or at Case Support in region. The Approval Sample shall be properly labeled and dated in respective location.

One sample is given to the sales organization for approval by the customer.

The Approval Samples shall be stored as long as the garment is in circulation.

3.5.2. Counter Sample

Minimum 3 pcs shall be produced of the Counter Sample. One of the approved, stamped and dated Counter Samples shall remain at Service & Product Concepts or at Case Support in region. One of the stamped Counter Samples shall remain at the Garment Supplier and one at the person responsible for quality assurance in the region.
The Counter Samples shall be stored as long as the garment is in circulation.

3.5.3. Production Sample

Production sample shall be taken randomly from ongoing production to verify that given sample and instructions are followed. The production sample can be taken in quality control during production (DUPRO). Verification of the production sample shall be done by the Quality Control. Service & Product Concepts or Case Support in region shall be informed about taken Production Sample and the results of the verification.

4. Manufacturing Guidelines

This Part relates to Lindström requirements in terms of workmanship and construction of garments, and the safety issues associated with their functionality and their manufacture.

All suppliers should read this part and be familiar with our requirements prior to making a submission for a tender.

Lindström provides the Garment Supplier with a Tech Pack and products pattern files.
Tech Pack includes garment's specification: style (design), bill of materials and accessories (BOM), table of measurements and information of design and construction details and sewing instructions (Cross Sections). Measurements given in the specifications shall be strictly followed. Points of measurements are defined on Measurement POM Library Report –document that will be delivered to the Garment Supplier.
See 4.3. How to Measure

Tech pack may be updated with comments or other information of modifications of fabric, trims, sewing/installation and construction details pattern. Garment Supplier can be provided with Approval Sample. The Garment Supplier must follow all given instructions.

Counter sample from the Garment Supplier shall be approved by Lindström before starting production.

The Garment Supplier shall notify Lindstrom of every intended technical change during sampling or before the production of the products and this notification shall be sent as early as possible. A written approval for such a change is a must from Lindstrom.

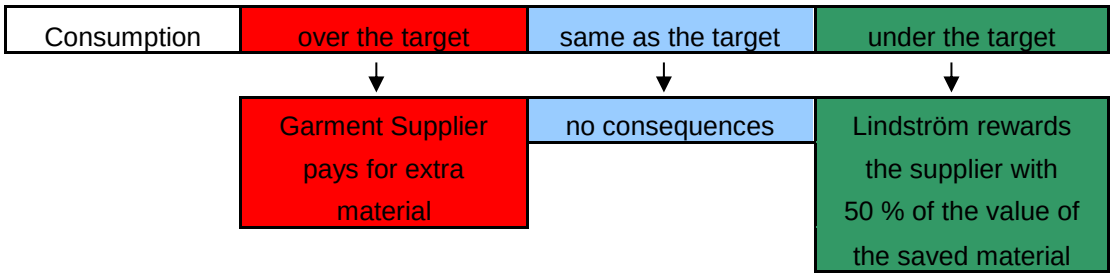
Certified protective work wear complying standards have more detailed requirements and they must be strictly followed. Specifications include information from CE-labels and pictograms, User manuals, Washing grids and other elements, which are not used in standard work wear and rental work wear. Detailed instructions for certified protective work wear are given in style respective Tech Pack and product pattern files.

The part contains:

- Cutting guidelines
- Markers
- Spreading
- Bundling
- Sewing
- Tech Packs and Specifications
- How to Measure Instructions
- Construction details
- Labels and Markings

4.1. Cutting Guidelines

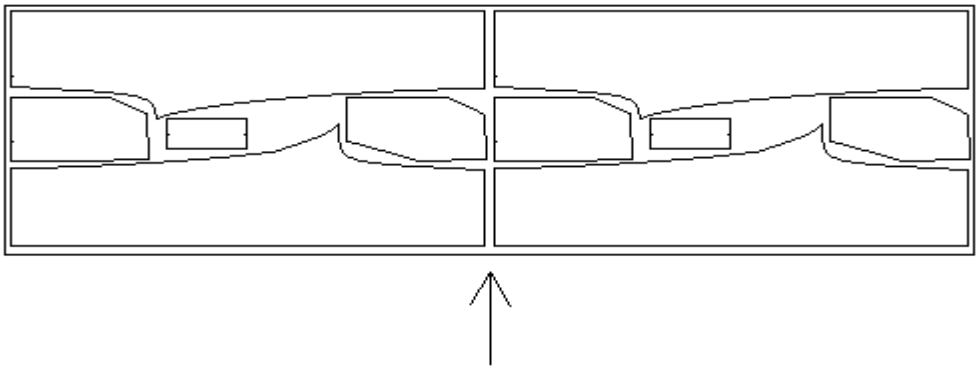
Lindström calculates the target consumption for fabric for each garment style separately to secure efficient consumption of fabric. The chart clarifies the consequences of reaching a fabric consumption target when CM or CMT sourcing is used and Lindström is financially responsible for the fabric.



Consequences of reaching to fabric consumption target in CM and CMT sourcing.

If the Garment Supplier buys the fabrics for the garments – the full package concept is employed – material costs are highly affected by cut planning.
Cut planning shall be made for three different fabric widths. The standard width of a fabric is 150 cm, which requires a cut plan that is 148 cm wide, since 1 cm extra space on both edges must be given to prevent faulty cut pieces.
There are fabric rolls that are narrower or wider than standard. The widths can be, e.g. 148 cm, 150 cm or 152 cm. Therefore, cutting plans for narrower and wider rolls must be made. Since the width of fabric rolls is measured and sorted on arrival, cut planning shall be informed about the actual width of the rolls. Cut plans are made according to this information.

Fabric width measuring and the length of the fabric in rolls are checked from roll tickets on arrival in the garment factory. Fabric rolls needed for markers shall be chosen from stock so that whole rolls are used as much as possible. Change of fabric rolls create costs because often the garment pieces cut from the change point are defective. The defects can be partially prevented by cut plans that enable roll changes. With a proper cut plan fabric pieces of different shades can be separated. An example of a cut plan that enables changing a fabric roll can be viewed in figure below.



Example for a cut plan enabling fabric roll change in the middle of a fabric layer

By proper cutting plans lots of fabric can be saved. Information about defects on fabric can be transferred to a computerized cut planning system where patterns easily can be moved or reorganized.

Cutting devices shall be sharp and well maintained to ensure clean, unburned and unfused edges. Cutting shall be efficient and precise. Computerized cutting equipment is fast, accurate, and when they are employed, mistakes rarely happen. After cutting, required markings are made to fabric pieces by notchers, drills and tread markers.

4.2. Markers

Cutting plans are either drawn onto a marker-paper by an automatic plotter or transferred to a computerized cutting device. If computerized cutting equipment is used, actual drawn markers are not needed because the cutting device cuts directly according to a cutting plan. Paper markers can be copied to cut similar cutting plans in the future. Copying consumes large amounts of paper. Computerized cutting is more cost effective than copying due to less paper consumption especially when a large number of markers are needed.

4.3. Spreading

Spreading of fabric shall be done in two stages. In the first stage a quality check shall be done to the fabric. Fabric rolls to be spread are chosen – in addition to the type and color of fabric – according to the width, length and batch, which is given on the roll information ticket of the fabric manufacturer. The width and length of fabrics shall be measured to secure that information given by the fabric manufacturer is correct.

If light table inspection of the incoming fabric has been carried out as described in 3.3.4.2 in the quality check at spreading the width and length of the fabric shall be measured. If at spreading holes, shading and mis-weaves, cuts and yarn distortions are still discovered instructions below shall be followed.

The defects shall be marked at the edge of the fabric with colored tapes or stickers. A piece of fabric with a small defect can be replaced after cutting, but a large defect may require cutting some fabric away. e.g., a colored paper can be placed on top of defective fabric section. After cutting the defective garment piece can be easily located and replaced.

Required actions at fabric examination

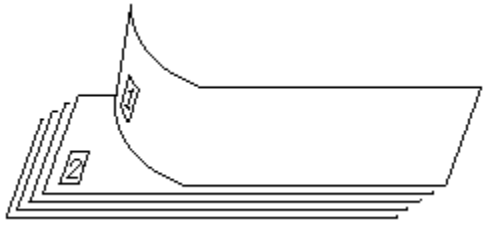
Sufficient accuracy of quality check is: if the defect can be visually seen by a person that has good eyesight, a defect in quality exists. The Garment Supplier must take care that the pieces of fabrics with quality failures do not enter as garments.

The second stage of spreading is the actual spreading of the fabric. The fabric shall be spread accurately and without tension onto the cutting table according to the length of the marker. Correct ply tension is especially important for knit fabrics. Spreading equipment can be used to assist spreading fabric faster than by doing it manually. Direction of fabric may differ depending on the patterns, equipment and fabric type. A garment that

contains symmetrical pieces can be cut either fabric spread face to face or all plies in the same direction, and asymmetrical pieces from a lay that contains only lays in one direction.

4.4. Bundling

Fabric pieces are bundled into stacks, which contain similar pieces of the same style and size. Sewing operators have to pick the fabric pieces systematically from the top or bottom of the stacks, because there might be different colors and different shades of colors in the lay. If there are different shades of the same color in the stack, the plies have to be numbered with pressure-sensitive tickets. The tickets also reveal the right side of the fabric if it is difficult to recognize. An example of a fabric piece stack that has been marked with number tickets can be seen in figure below.



Fabric piece stack with number ticket on each ply

A style number, size and part identification shall be marked on the bundle, e.g., on the top ply. The marking can be on the pattern paper or it can be written on an adhesive label that is attached to the top ply.
If a garment piece is to be replaced in the bundle, the replacing piece shall be put into the same position. The order of the garment pieces in the bundle does not change and correct colors and color shades are in the similar position.

4.5. Sewing

The construction and manufacturing of garments shall follow what is described in Tech Pack and other by Lindström provided material. The supervisor of the sewing department shall provide the operators with proper sewing instructions before production starts. The supervisor shall be responsible for that the instructions are understood and followed by doing checks during sewing.
Before sewing, support fabrics are attached to the correct fabric pieces to correct locations. The fabric pieces that require support fabric must be marked in the instructions. Additionally, the correct locations for the support fabric on the fabric pieces shall be marked.

Garment Supplier shall pay special attention to that deviations in the sewing quality are minimized by using right type of machines for making the different details in the garment.

4.5.1. Sewing Needle

Care shall be used when selecting needle and point size/type to avoid damage to fabric/accessories and needle. The selected needles shall be compatible with the thread. For fabrics gsm <150 need number 14/90 or lower shall be used. For fabrics gsm 150> needle number 16/100 shall be used.

Garment Supplier is responsible for ensuring that the customer's safety is not compromised in any way by the finished state of the Work Wear. This objective must be actioned through quality inspection procedures and line supervision during the manufacturing processes. It also entails compliance with the standards, regulations and Acts listed under Compliance in the Quality Assurance section, Volume 1 of this Handbook.

Garment Supplier is responsible for that no parts of a broken needle are left in the garment being sewn. If necessary the garments shall be passed through a metal detector.

4.6. Tech Packs and Specifications

The Tech Pack and other specifications for each contracted item are delivered to the Garment Supplier and to the Quality Controlling body, internal or external.
The instructions given on the documentation shall strictly be followed. For any contradiction or error in or between the documents shall without any delay be reported to Lindström.

4.7. How to Measure

The measurements shall be taken in the correct position and correct way, as well as accurately.

The exact measurements for the garment in question shall always be checked on measurement table resp. Tech Pack.

Instructions for measuring of the garment are guided on Measurement POM Library Report –document that will be delivered to the Garment Supplier.

Supporting materials:

2.1 - 4.7_1 Measuring Instructions

4.8. Construction Details

This part gives guidelines for seam quality and workmanship and describes the details of the of the construction details of the garment.
Garment must be made according to Tech Pack instructions. Tech Packs construction details show general construction information of closures and elements. Style related instruction of stitching is given in Tech Pack in detailed black and white sketch.

4.8.1. Seam and Stitches

The seam and stitch type in garments shall follow Lindstrom's sewing instructions and samples. Detailed information of instructions for seams is in Tech Pack Sewing instruction and sewing detail.

Stiches must not be broken and skipped stiches must not occur.
Stitch formation shall be correctly balanced and tensioned to prevent seams from distortion, grinning or puckering. Seams shall not crack under tension and therefore, stitching shall have extension properties compatible with the fabric. The minimum of Stitch density shall be 3,5stitches per 1 cm or following Lindstrom instructions. In general, a centimeter of seam allowance shall be allowed on all seams. Exception to seam allowances is noted in Tech Pack and pattern files.

A 3 cm overlapping of threads shall be ensured when thread is broken.

Seam slippage must not occur. All plies shall be fully included and fabrics must lie flat within the bight of the seam, unless specifically required otherwise.

Following stich types are used in Tech Pack and specifications:

Lock stitch

Stitch formation and stitch tensions shall be correctly balanced to provide a stable seam with adequate extensibility, and to prevent puckers/puckering or seam grinning. Ends of stitching shall be securely back tacked to prevent unraveling.

Example of a special seam and stich type combination used in trousers' front rise seam:

3-thread lock stich seam is sewn with a double top stitching of 2-3 mm distance.

Over lock

4 thread (knitwear) or 5 thread (fabric) over lock shall be used according to Lindstrom instructions. Normally, a minimum bight of 0.8cm shall be used and it shall neaten the visible raw edge to eliminate the fraying to great extent. It is important to ensure the blade is replaced regularly to guarantee a clean cut edge.

Chain stitch

Double thread chain stitch shall be used. It is important to ensure ends are adequately.

Top stitching

Top stitching is instructed as a 1-needle or 2-needle stitching.
Top stitching shall always be neat and uniform. Stitch joins on the front of garments are not acceptable and shall be avoided in other areas wherever possible. All top stitching shall be secured against unraveling.

4.8.2. Construction and Sewing Details

4.8.2.1. Collar and Neckline

Collar

The collars shall be symmetrically positioned and they shall have even, flat points. The fold line of collars shall be smooth and free from wrinkling. The lead edge of a collar shall be equal in length when fastened and not overlap.
Necklines shall never be puckered or stretched after collar attachment. Fraying or visible edges of seam allowances shall not occur when attaching collar to bodice.

Neck finishes

Necklines shall be symmetrical in shape. They shall not be stretched or distorted.

4.8.2.2. Waistbands, Hem, Cuffs

Waistband

Waistband shall be flat and of consistent width. If a zip extends through the waistband, special care shall be taken to ensure that the seams do not interfere with the functioning of the zip. If an elastic waistband is used, full extension and fully recovery of the waistband shall be allowed.

Sleeve ends and hems

Construction details in sleeve ends and hem are to be followed. Seam allowances must not twist or pucker.

Ribbed cuffs

Separate cuffs shall be attached straight to the sleeve. Measures and construction details for rib cuff are given in Tech Pack. The closing seam shall follow the wale of the rib. Double rib cuffs shall be lock stitched closed and attached in a circle. The stitch and tensions shall be so that the rib is stretch to accommodate the hand.

Elasticated cuffs

Sleeve and/or leg end can be elasticated by using elastic band. The width and the length of elastic band is defined in Tech Pak.

The measurement of the tunnel for elastic band in the sleeve/leg end is taken into account in the sleeve/leg pattern. Construction of the elasticated cuff is described in Tech Pack.

4.8.2.3. Closures and Fastening

Placket and fly

After attachment, the finished placket shall always lie flat, must be free from pucker and roping and shall be of a consistent width. When fastened, the top placket shall cover the under placket. Ends of plackets shall be squarely positioned and any notches at the base of the stand shall be enclosed.

Button with holes, button hole

Button type and button hole shall be checked and matched. Button and button hole must be aligned correctly.

Buttons shall be securely attached. Button shall be stitched with a minimum of 12 stitches. Small cut of enforcement fabric on the inside back shall be used for the area of one layer fabric. Sufficient thread shank shall be used to enable the garments to fasten with ease.
Button hole shall be stitched securely and neatly, with full uniform edge cover without damage or distortion to the fabric. Button hole must be sized and cut correctly.

Press buttons (fasteners)

Press buttons shall be securely attached to the garment and long lasting. They shall not be applied to a single layer of fabric and an additional layer is generally required in the one layer area.
Press buttons are to be fastened accurately according to instructions of position and spacing.
Press buttons on zippers closures must not be placed on zipper.

Buttons positioning (marking) shall be done correctly and shall not be visible on finished garments.

Manual attaching machines shall never be used to attach fasteners as security is inconsistent. Either semi- or fully automatic machinery shall be used. They shall never be attached across seams of uneven thickness.
Correct tools shall be used. They shall be regularly checked to be sure in good conditions (pressure, distance).
The tools shall be replaced at regular intervals to ensure the deformed or worn-out one is not used anymore.
It shall be impossible to rotate or move the fabric around a post or prong fastener.
The cap, post or prong shall be without any deformation.
The back of all post attachments shall be flat. A rounded appearance indicates insufficient clenching pressure.
The fabric shall be firmly clamped so that it is impossible to insert a thin object such as a fingernail, between fabric and fastener.

According to Pull Test the value for press buttons shall reach 90N/10s.

Zipper

Zips shall be from an approved supplier and comply with the specifications. The following shall be avoided: any incomplete function, too loose or tight of sewing, the pucker or uneven or unstraight zipper. The base of zip openings shall be securely back tacked at the end of the seam to take the strain during dressing.

Braces

Braces used in bib and braces are to be sewn according to instructions.
In ready garment brace shall be detached correctly to bib.

4.8.2.4. Elements: Pockets, Linings

Pockets and flaps

Paired pockets shall be symmetrically placed and equidistant from the center front and back of the garment. Marking shall not be visible on finished garments. Both ends of the pocket mouth shall be securely reinforced with bar tack or back tacked (following specifications). All pocket corners shall be free from picker and distortion, and all raw edges and cuts at corners shall be fully enclosed. Pocket flaps shall be flat and size big enough to cover the pocket opening. Pockets in seams: they shall not distort the hemline and openings shall lie flat in wear.

Interlining

Interlining shall be fused and pressed with face fabric by following exactly the instruction of temperature, pressure and contact time and other info from supplier to avoid any de-lamination in wash and garment use. Interlining shall be evenly used and prevented from deformation or puckering.

Linings, quilted linings

Linings shall not be visible and shall not distort the garment or restrict the movement of the wearer.
Construction details and sewing details must be followed.

4.8.2.5. Other Instructions

Garment shaping

Such as darts, tucks, gathering and pleats, etc., shall be in line with the sewing detail instruction.

Facings

Facings shall always be cut on the same grain as the outer fabric in order to avoid garment distortion. They shall be flat and not be visible on the outside of the garment, unless otherwise required as a design feature. All raw edges of facings shall be over locked neatly. Waist, neck or armhole facings shall be cut to a sufficient depth to obtain a clean finish and should not roll to the outside.

4.9. Labeling and Marking

Sew-in labels

All labels are manufactured by approved suppliers and partners.

All labels must be securely sewn so they remain permanently attached to the garment.
Labels must be attached so that none of the wording is concealed in the seams.

Each piece garment must have fiber composition and country of origin on its labels.

Country of Origin

In Lindström orders for CE-marked garments a separate sew-in label for Country of Origin is to be sewn directly alongside the Lindström label and positioned as stated in the Tech Pack for respective garment. The language on the label shall be English.

Fiber Composition
The Supplier of the garment must list the correct fiber composition on their specification. The composition shall be given using internationally known abbreviations, e.g. CO, PES, etc.

This label is to be sewn on all by Lindström ordered CE-marked garments and on customized garments given on the purchase order.

Supporting Material

2.1 – 4.9_1 Instructions for Country of Origin and Fiber Composition Labels N/A

4.9.1. Purchase Order Label

Purchase order label shall be attached to each product in a visible position for easy checking when the product is folded in stock. Tracking of an order lot can easily be made from the label in the laundries when necessary.

Supporting Material

2.1 - 4.9.1_1 (L0298) Purchase Order-label position

4.9.2. Logos and Labels

Lindström brand labels

Lindström brand labels, seam label and hanger loop label are woven and pre-folded. They are sewn according to Tech Pack. Placement of the label varies according to product type.

Woven Label for Size and Product Number and Hangering Band in Garments

Labels for size and product number are woven and pre-folded. They are sewn according to Tech Pack. Placement of the label varies according to product type.

Hangering band is woven and sewn into the garment according to Tech Pack.

Customized labels

Customized logos and labels are either sewn in labels, printed logo labels or embroidered logos. Sewn in labels can be woven or embroidered logo labels.

Customer logo can also be embroidered directly to garment in some products, like t-shirts and chef's jackets.

Customer logo or picture can be printed to knitted garments with screen print or heat transfer. Print result must not be cracking, print should not be unclear, soiled or colors mismatching.

All customized logos and logo labels are instructed with separate instructions.

4.9.3. Heat Transfer of Labels

Heat transfer labels are attached to Ready for Sales products (from knitted material) according to work order at a pre-defined location in each country where the heat transfer labels are available. At these locations a thereto suitable press for attaching the heat transfer labels is available. This way standard quality can be guaranteed for the fastening of the label.

4.9.4. UHF RFID Tags

Heat sealable RFID tags are attached to the garments for tracking garments in circulation during their lifecycle.

Using RFID tags in garments is noted in Tech Pack (Bill of material and sewing instructions). Instructions for Placement and Attachment of RFID tags in different garments is described in detail in supporting material.

Supporting Material

2.1 - 4.9.4_1 Placement and Attachment of heat sealable RFID Tags, January 2017

4.9.5. Marking Label

Marking label is a piece of fabric with printed or stamped information of garments size and product code. Marking piece is made from fabric's reverse side up. Size, shape, placement and attaching structure of the marking label is instructed in the Tech Pack.

Color of the marking/stamp is white for dark colors and black for white and light colors. Ink of the stamp must be suitable for textiles and industrial washing. Stamp must not stain garment or leap in heat contact.
Font type and size used shall be clear and approved by Lindström.

4.9.6. Washing Grid

Washing grid is a specially sized marking label with a pre-printed grid for counting washing cycles, and it is mainly used in Protective wear. Attaching grid to standard work wear is always instructed in Tech Pack.

Color of the marking/stamp is white for dark colors and black for white and light colors. Ink of the stamp must be suitable for textiles and industrial washing. Stamp must not stain garment or leap in heat contact.
Font type and size used shall be clear and approved by Lindström.

5. Finishing and Packaging

The finished garments shall be clean, dry and neat, free from any soiling and odor. Dirt or any mark shall be removed. All thread ends shall be trimmed and removed. No any objects attached or inside the garments, such as safety pins, scissors, needles or needle parts, pins, pens, button or machine parts, tools, loose accessories, etc. are allowed.

5.1. Folding Instructions

Garments must be folded to avoid creasing.
Coats, shirts, jackets and overalls are folded by using a folding plate.
Dungarees, trousers, winter coats, bermudas, waistcoats, terry towels and aprons are folded without the folding plate.
Folding is performed according to the product-specific instructions.
The folding plate is installed fixed. The front edge of the plate is ca 4 cm above from the table's surface.
Supporting Material:

2.1 - 5.1_1 Folding instructions

5.2. Packaging Instructions

This part relates to the requirements for packing of the bulk ready for shipment.
Garments are to be packed in one inner poly wrapper per carton. The poly wrapper must be sealed.
Garments must NOT be packed in individual polybags.

Garments must be dry before being packed

Supporting Materials

2.1 - 5.2_1 Packaging instructions for garments

6. Quality Control

The supplier shall follow the instructions given by Lindström in this Quality Assurance Handbook when producing garments. The supplier shall have an internal quality assurance system for quality control on line.

Quality control shall be done, without any exception, for all incoming fabrics and accessories, for garmenting during the production and for the finished garments.

Lindström or by him nominated external representative carries out quality control during production or for finished garments according to what is described below in paragraph 6.1.

The quality control shall in first hand be done by comparing the labeled counter/reference sample to samples from production. The documented manufacturing instructions provided by Lindström shall be turned to if some deviations are found. The provided documents shall be valid in following sequence:

- Pattern
- Tech Pack
- Other instructions

6.1. Supplier Categories in Quality Control

The Suppliers are classified in three main categories according to the need of level of quality control for their products. The classification is based on their status in the Lindström Group supplier base and the product categories they supply to Lindström Group as follows:

Well-established regional supplier

a. Long business relationship with Lindström Group
b. products of established standard quality on Lindström Group or supplier specification

Need of quality control: Random FRI

2. Well-established global supplier
   a. Long business relationship with Lindström Group
   b. Products manufactured on Lindström Group specification

   Need of quality control: Random FRI

3. Supplier in introductory phase or production under special observation
   a. New supplier in starting phase
   b. Existing supplier manufacturing a new product on given specification

   Need of Quality control: DUPRO and FRI. Accuracy to be decided case by case

6.1.1. Specific Instructions for Suppliers in Category 3

6.1.1.1. Fabric Suppliers

Each delivery lot from a fabric supplier in Category 3 shall be tested as mentioned in paragraph 3.3.3. Tests and Testing laboratories and in Supporting Material of that paragraph.

6.1.1.2. Garment Suppliers

Each delivery lot from a Garment Supplier in Category 3 shall be Quality Controlled as follows:

- During Production Inspection DUPRO:
  shall be conducted for new styles if the ordered quantity is 500</style
  shall be conducted for existing style if ordered quantity is 3200</Style

  Random DUPRO can also be made for any style if ordered quantity is <500

- Final Random Inspection FRI:
  Shall be conducted if the ordered quantity for any style is 500<

Supporting Material
2.1 – 6_1 Defect List WWS