

Knowledge of Textile Goods

Teacher:

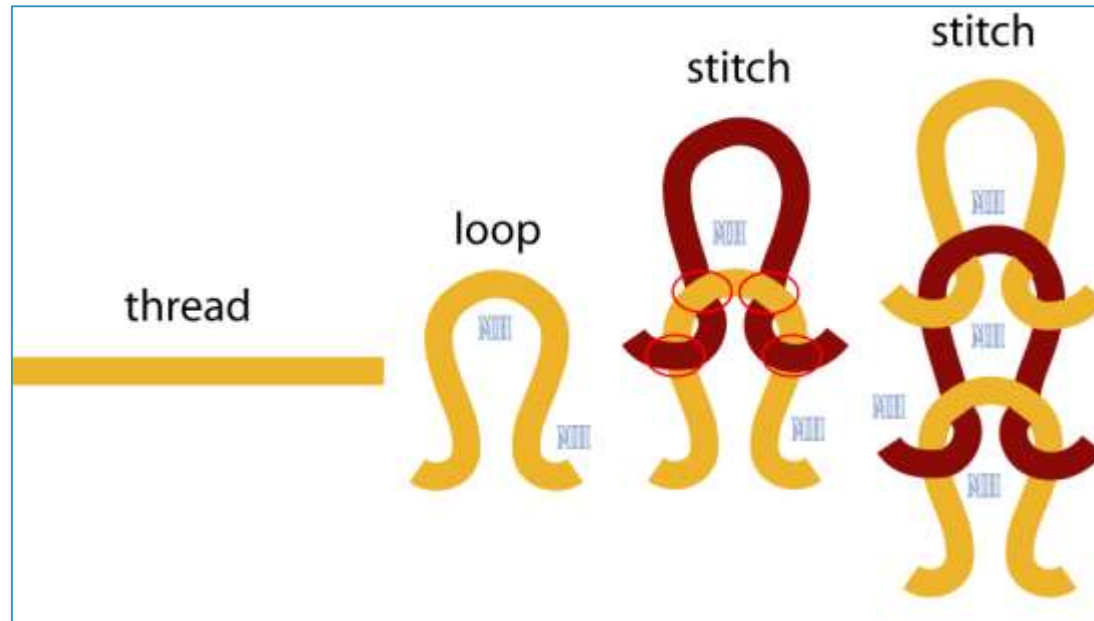
Ing. Marie Havlová, Ph.D.

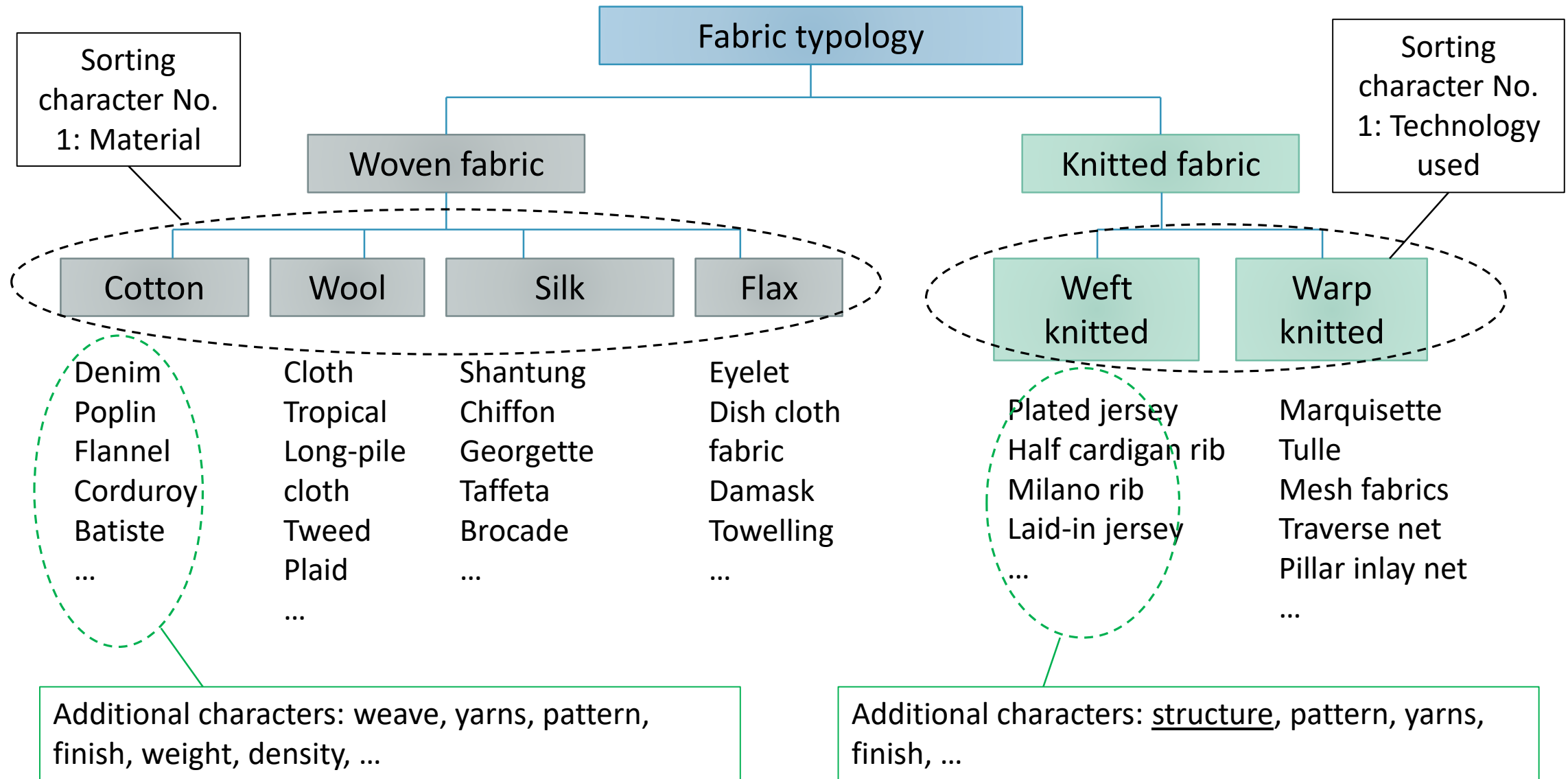
Lesson No. 7:

Knitted fabric structure and structural patterns
identification

Knitted fabric

Knitted fabrics – generic name applied to the textile fabrics in which at least one system of threads is formed into knitted loops and the knitted loops are **intermeshed into stitches**.



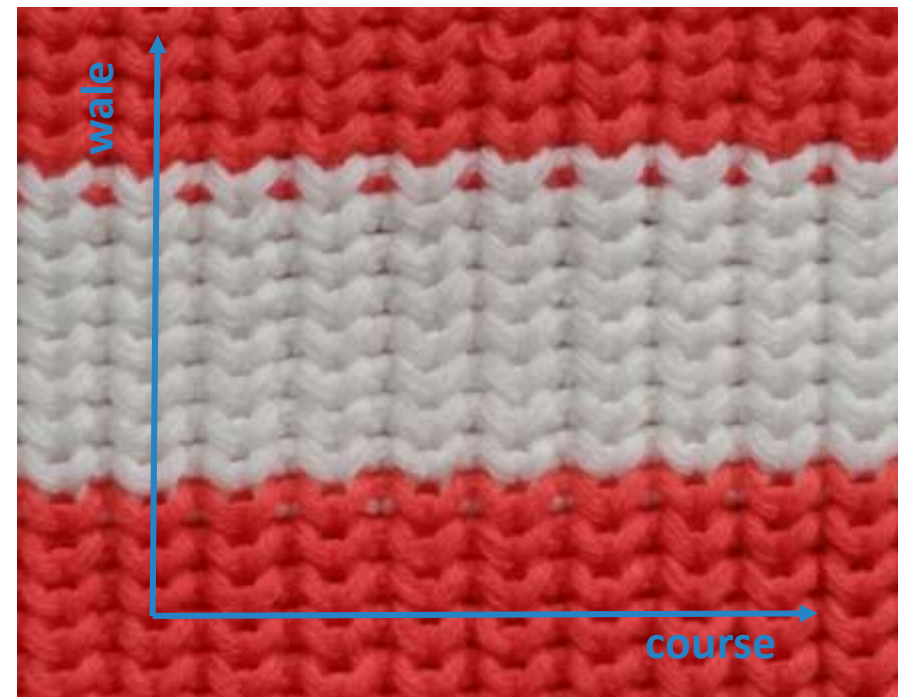
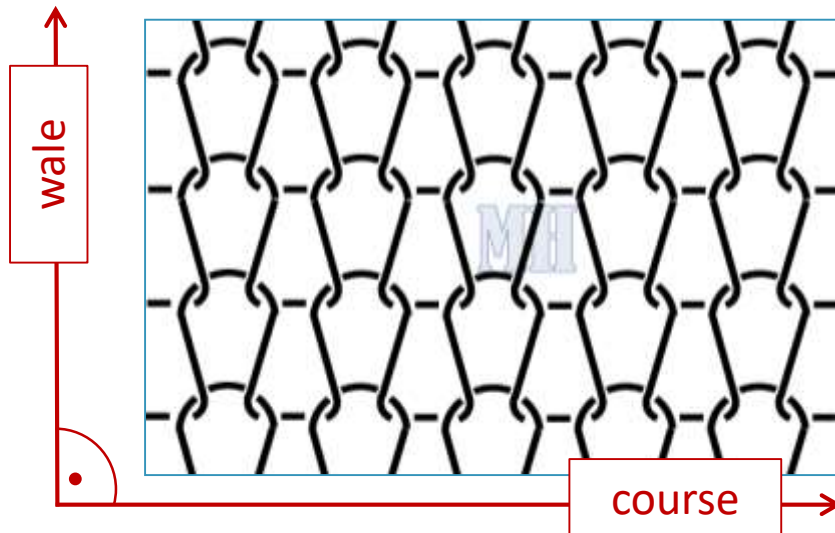


Hierarchical concept map

Wales and courses

Wale – a column of stitches along the length of a weft-knitted fabric.

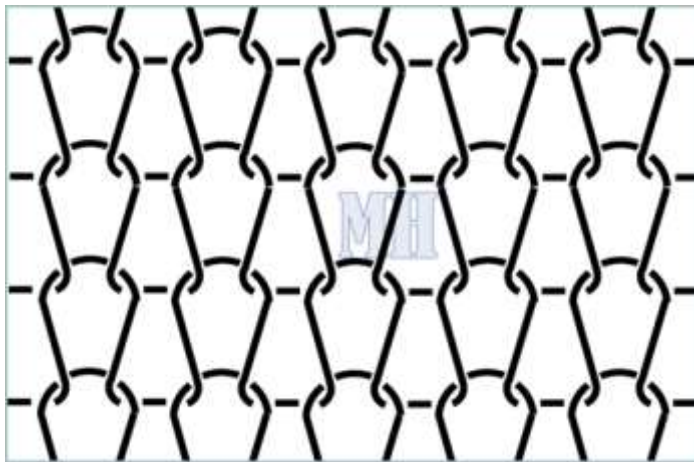
Course – a row of stitches across the width of a weft-knitted fabric.



Classification according to production technology

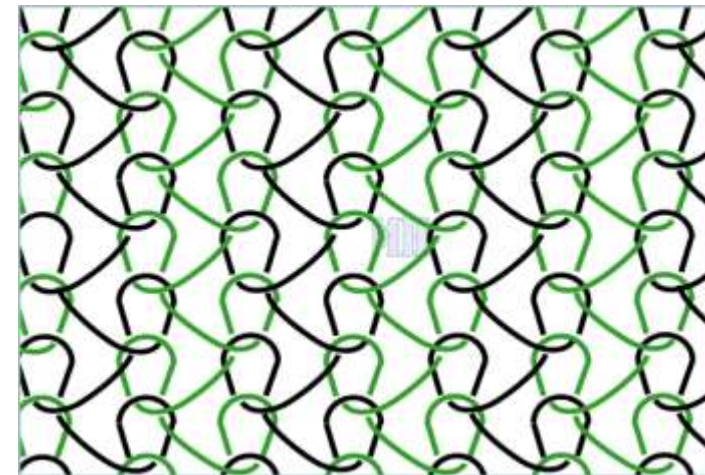
WEFT KNITTED FABRICS

The stitches made by each thread are formed **predominantly across the width** of the fabric.



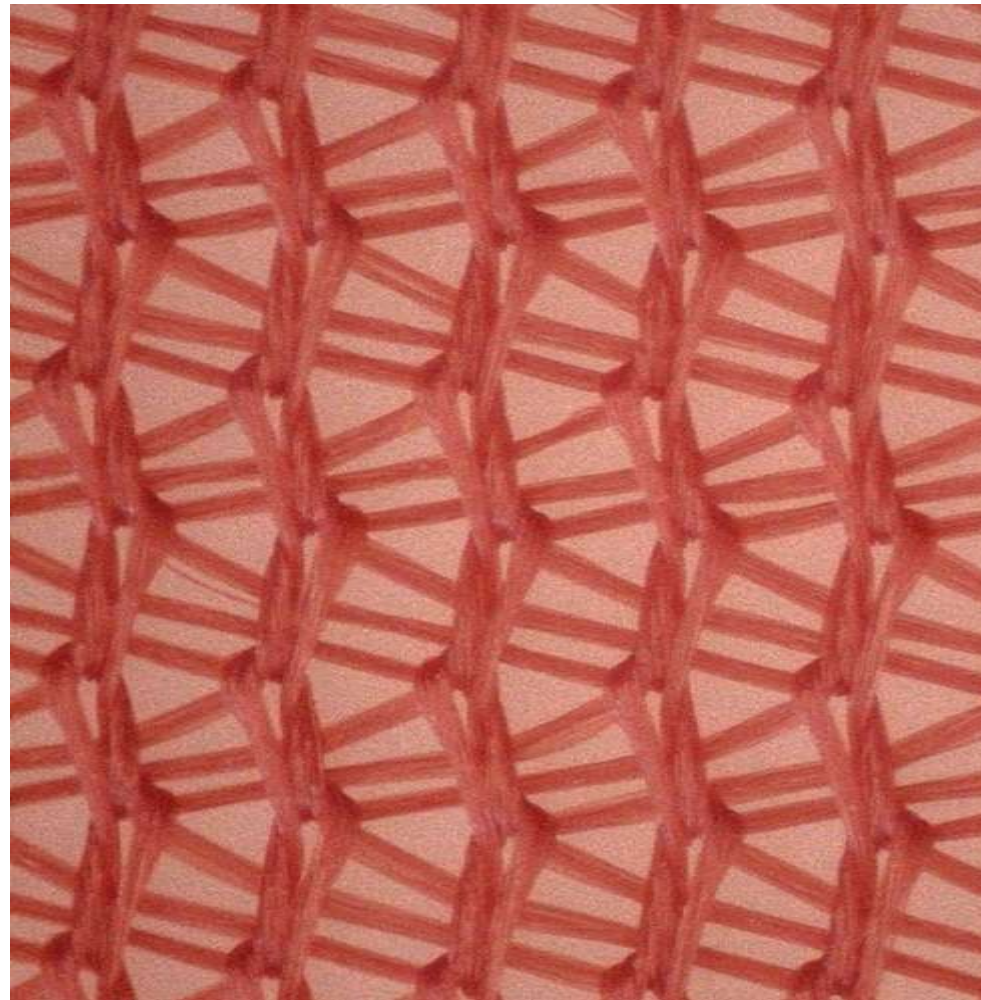
WARP KNITTED FABRICS

The stitches made from each warp thread are formed **predominantly along the length** of the fabric.





Weft knitted fabric



Warp knitted fabric

Weft-knitted fabrics

Weft-knitted fabrics – generic name applied to the knitted fabrics in which the stitches made by each thread are formed across the width of the fabric.

Each weft-thread is fed more or less at right angle to the direction in which the fabric is produced.



Face stitch, reverse stitch

Face stitch – is formed, when the loop go through from back to front. It is name for face side of the stitch.

Reverse stitch – is formed, when the loop go through from front to back. It is name for reverse side of the stitch.



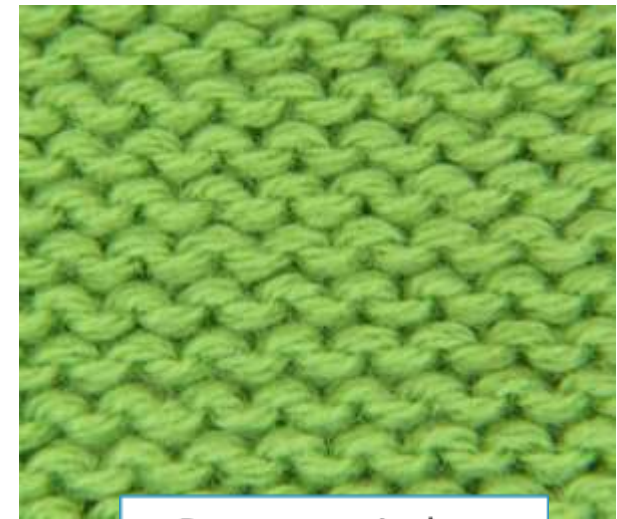
Face stitches



Face stitch

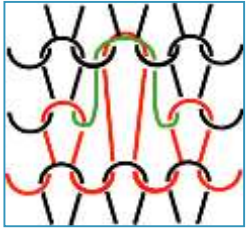


Reverse stitch

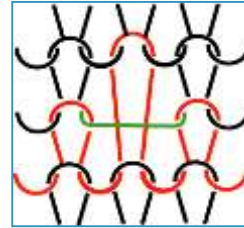


Reverse stitches

Tuck loop, Float (floated loop)



Tuck loop – a kink of yarn intermeshed at its top with the sinker loops of the following course.



Float – a length of yarn that has not been kinked by a needle and that connects two loops in the same course that are not in adjacent wales.



Tuck loops

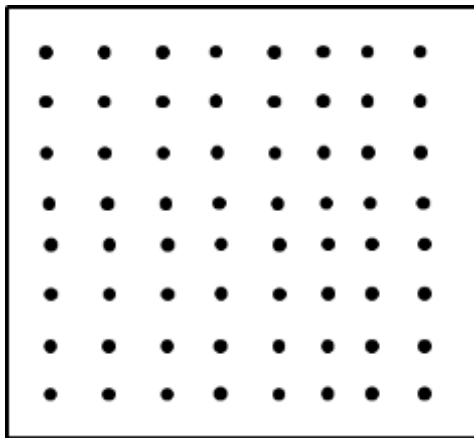


Floated loops

Schematic notation of fabric structure – yarn path notation I.

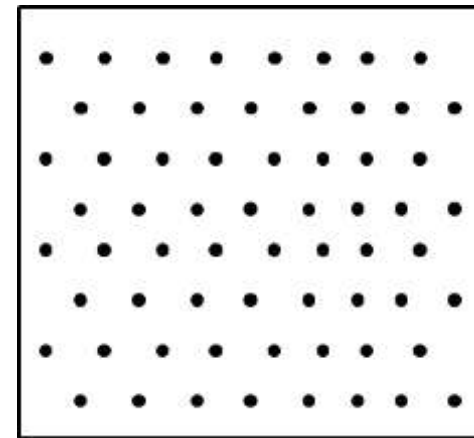
DOT MATRIX STRAIGHT-LINE

Grid, applicable to single jersey-based, purl-based and interlock-based fabrics, with parallel rows of dots according to the needle arrangement in the needle carriers.



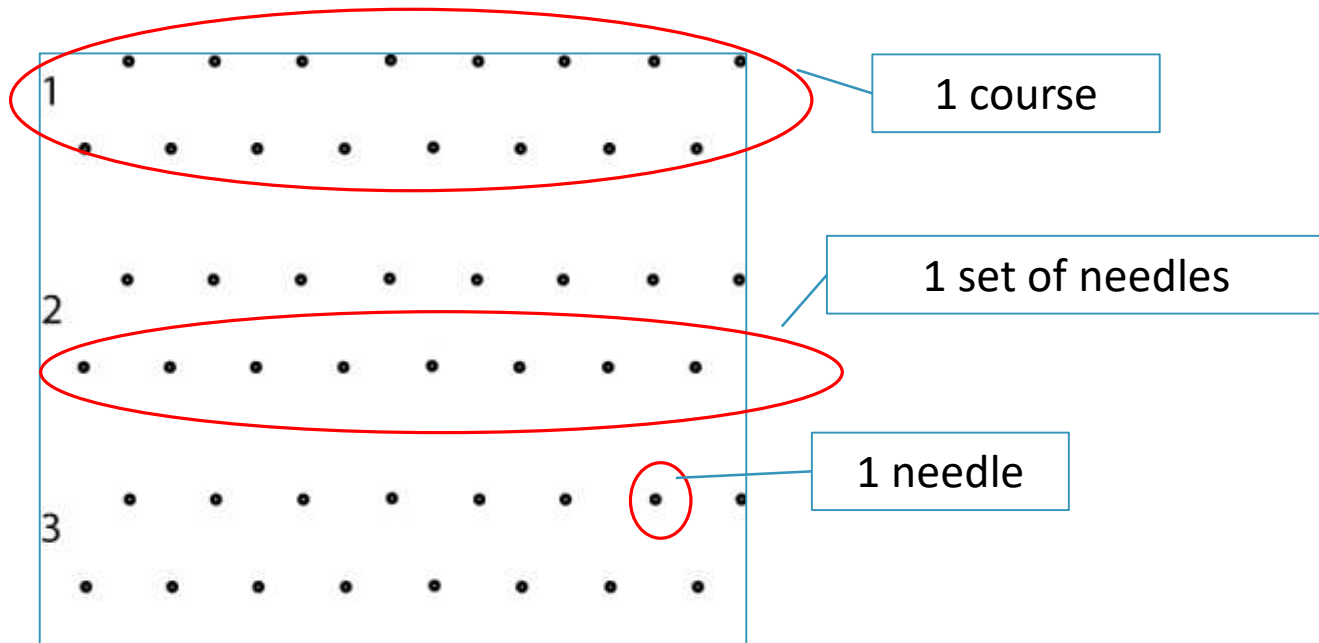
DOT MATRIX TRANSPOSED

Grid, applicable to rib-based fabrics, with transposed rows of dots according to the needle arrangement in the needle carriers.



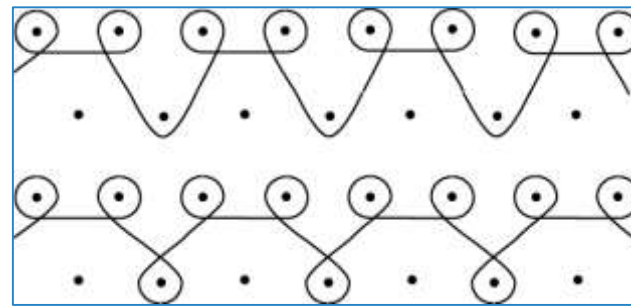
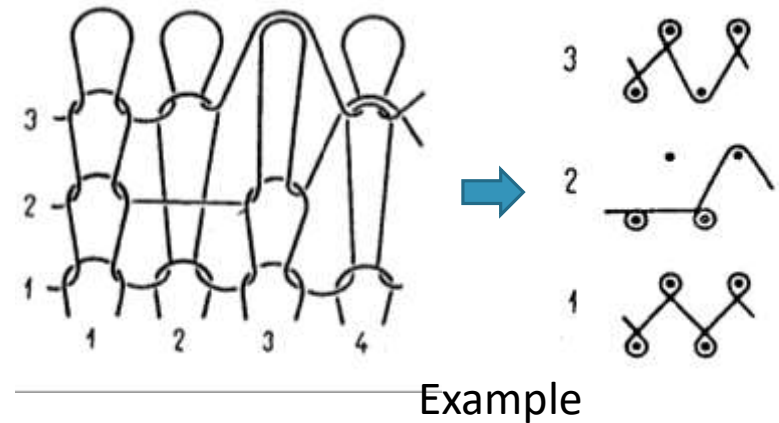
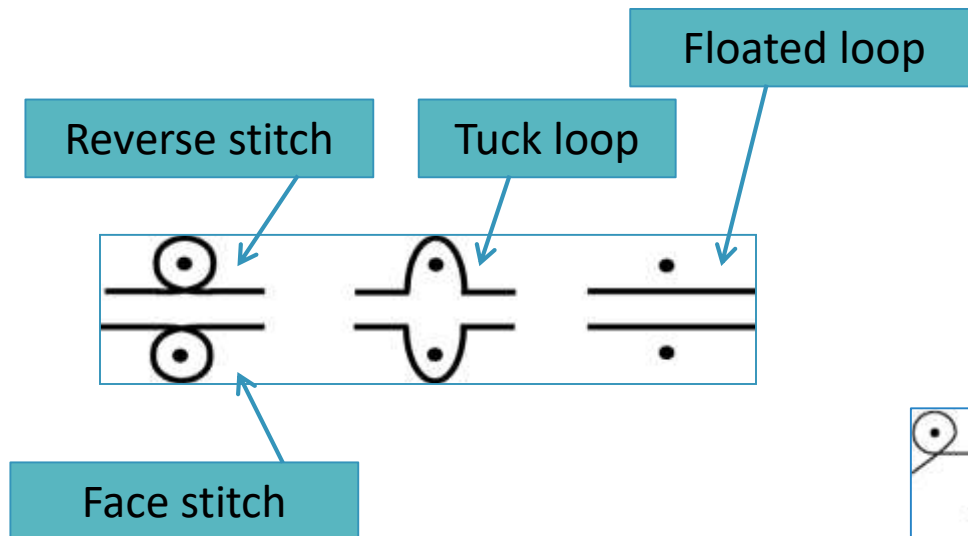
Schematic notation of a fabric structure – yarn path notation II.

This is symbolic representation of the structure of a knitted fabric.



Yarn path notation

Symbols used:

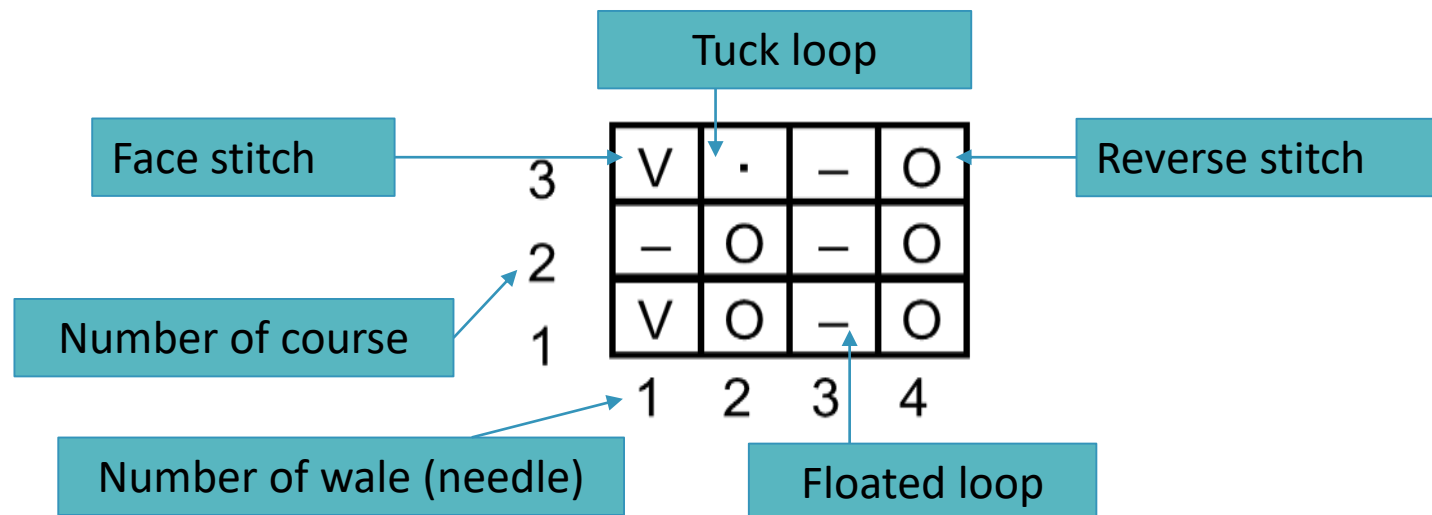


Example

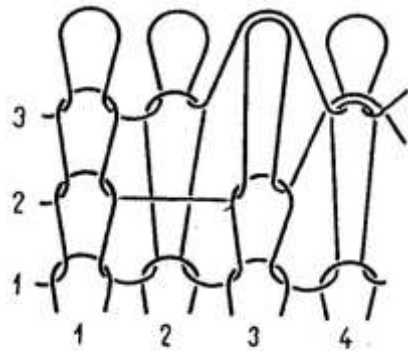
Schematic notation of a fabric structure – on squared paper

This method is mainly used for purl based knits.

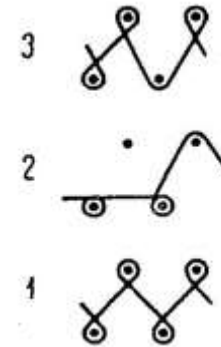
Used symbols:



Schematic notation on squared paper



3	V	O	•	O
2	V	-	V	•
1	V	O	V	O
	1	2	3	4



Example



4	V	V	O	O
3	V	V	O	O
2	O	O	V	V
1	O	O	V	V
	1	2	3	4

10	V	V	V	V	V	V	V	
9	V	V	V	V	V	V	V	
8	V	V	V	•	V	V	•	
7	V	V	V	•	V	V	•	
6	V	V	V	•	V	V	•	
5	V	V	V	V	V	V	V	
4	V	V	V	V	V	V	V	
3	V	•	V	V	V	•	V	
2	V	•	V	V	V	•	V	
1	V	•	V	V	V	•	V	
	1	2	3	4	5	6	7	8

Sorting of knitted fabrics by the structure

Basic classification of knitted fabrics according to their structure:

- Jersey-based fabrics
- Rib-based fabrics
- Purl-based fabrics
- Interlock-based fabrics



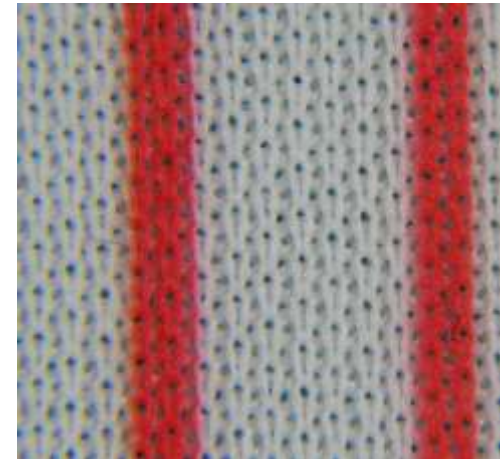
Jersey-based fabric



Rib-based fabric



Purl-based fabric



Interlock fabric

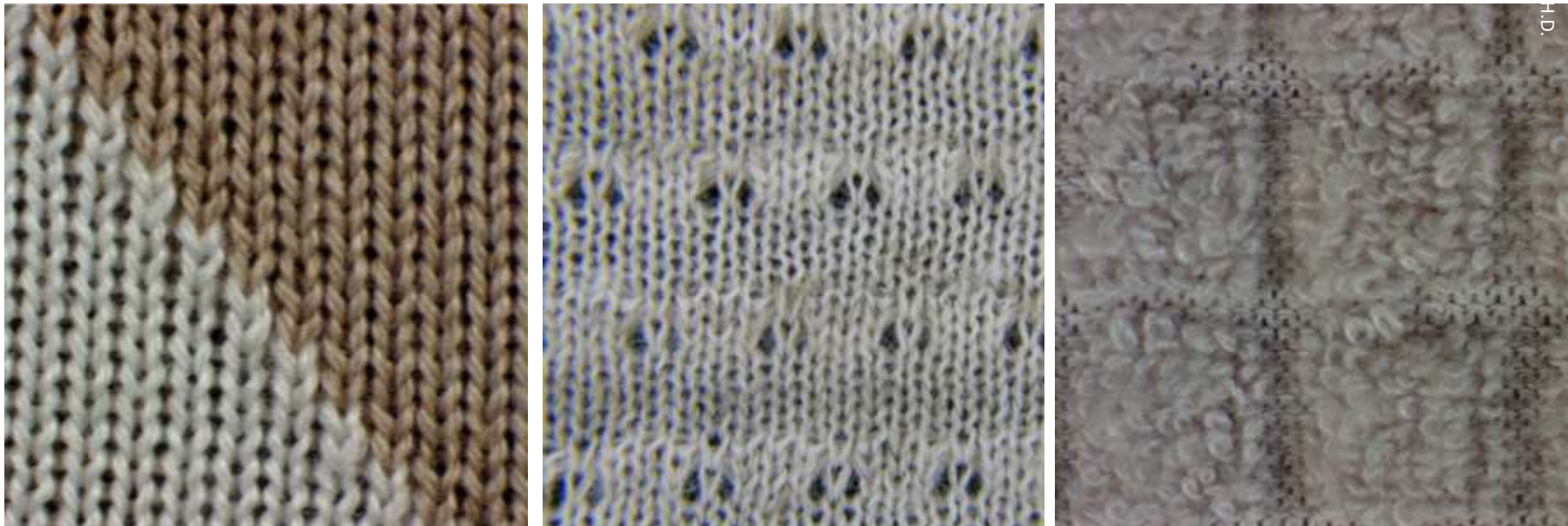
Jersey-based fabrics



1 set of needles

Generic name applied to weft-knitted fabrics the **technical face side** of which shows weft-knitted face stitches, while the **technical back** shows either reverse stitches alone or combined with tuck loops, transferred loops, terry loops.

These fabrics are produced on one set of needles.



Some examples of jersey-based weft knitted fabric



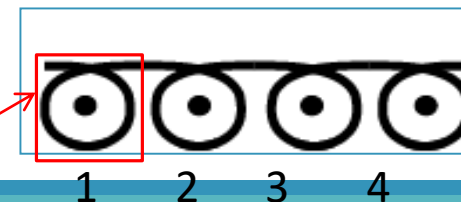
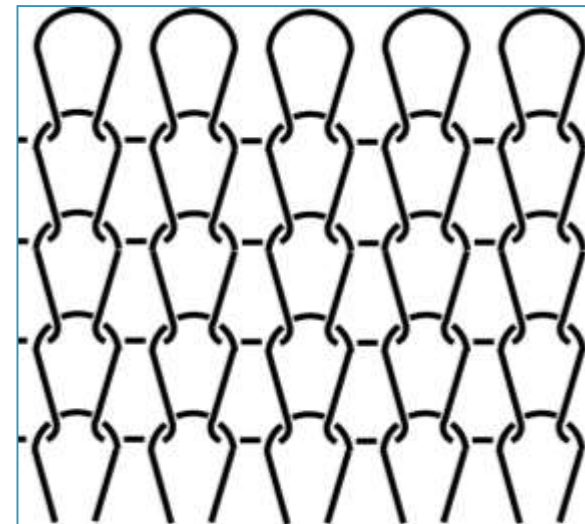
Technical face side

Technical back side

Plain jersey fabric

The fabric consists entirely of plain jersey courses.

The fabric is characterised by a uniform, non-patterned surface in which all the stitches are of identical size and configuration.



Pattern repeat –
only 1 stitch.

Technical face & Technical back

TECHNICAL FACE

(OF PLAIN JERSEY FABRIC)

Face side – that surface of the fabric that consists wholly of face stitches

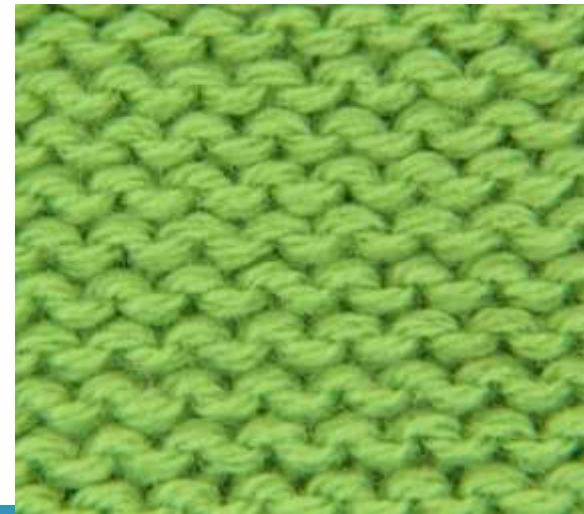


TECHNICAL BACK

(OF PLAIN JERSEY FABRIC)

Back – that surface of the fabric that consists wholly of reverse stitches.

The **technical back** is sometimes used as the **effect side** of the garment!

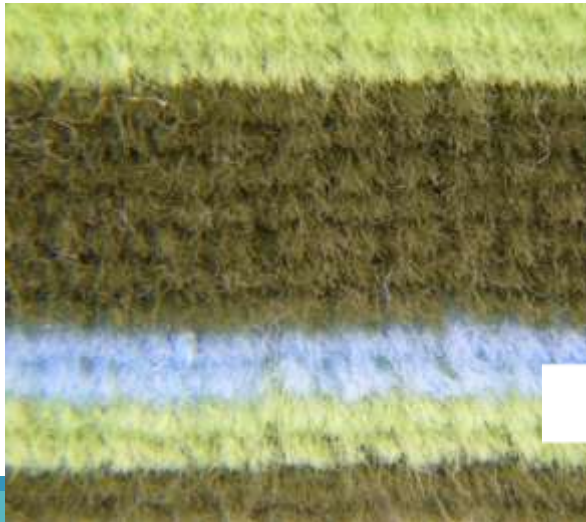


Effect side & Reverse side

EFFECT SIDE

That surface of the fabric that is intended to be used outermost on a garment or other construction.

This terms applies to weft- and warp- knitted fabrics.



Pile fabric

REVERSE SIDE

That surface of the fabric that is opposite to the effect side.

This terms applies to weft- and warp- knitted fabrics.





Jersey-based fabrics

Rib-based fabrics

Generic name applied to weft-knitted fabrics in which **both face and reverse stitches occur along the courses**, but in which all the stitches contained within any single wale are of the same type, i.e. face or reverse stitches.

Non extended sample



Extended sample

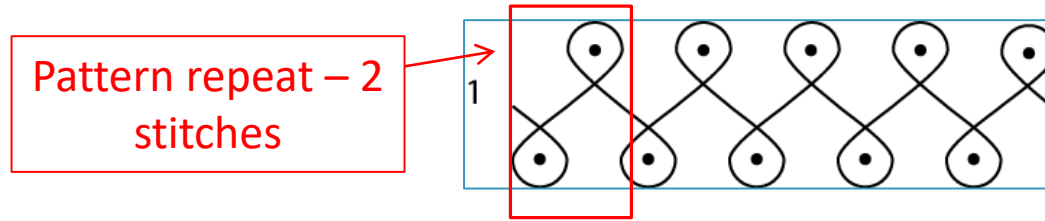


When not extended widthwise, a rib-based fabric normally shows only face stitches on both sides.

These fabrics are produced **on two sets of needles**.

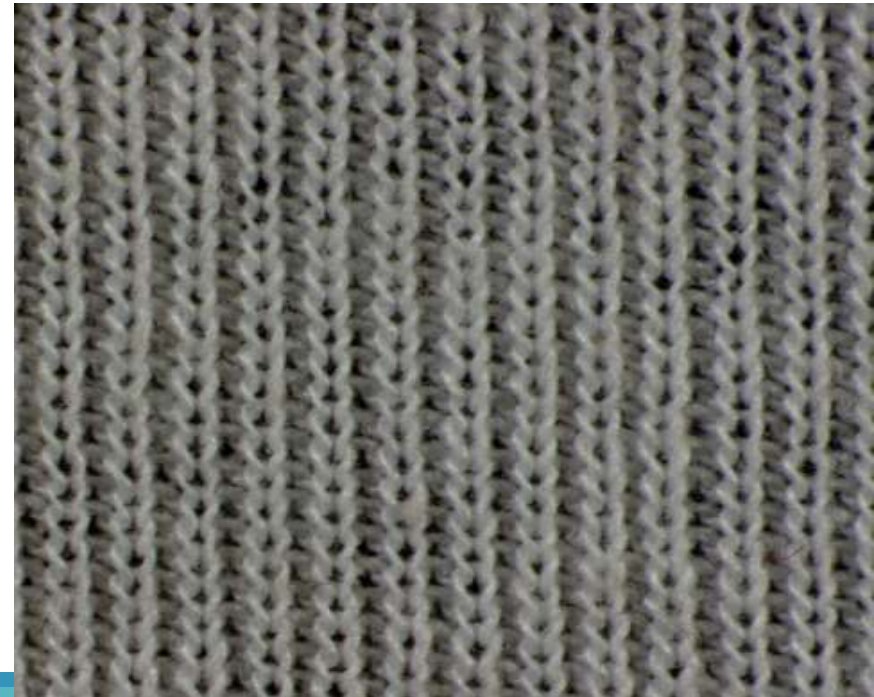
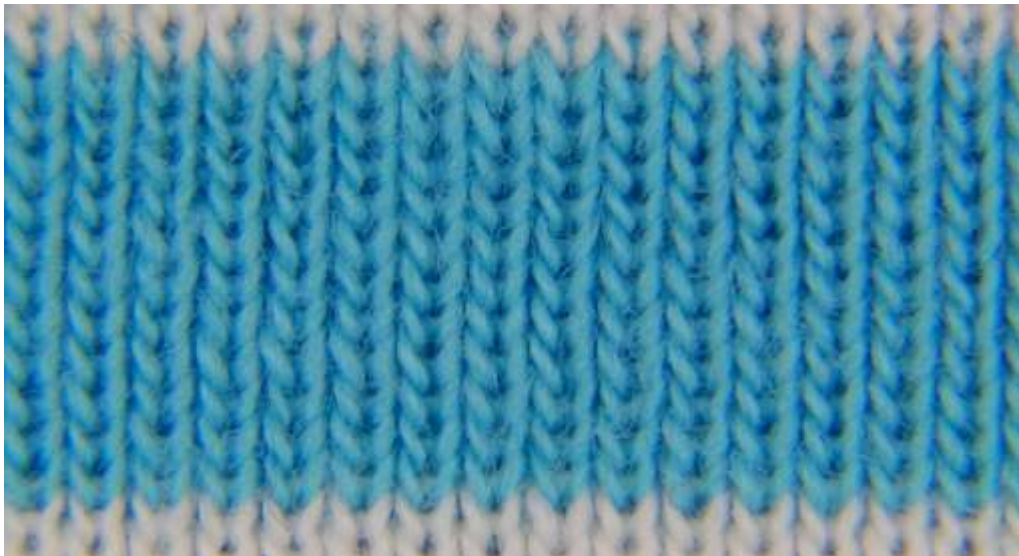
1 x 1 rib

One-by one rib fabric



Weft-knitted fabric that consists of 1x1 rib courses so produced that single wale of face stitches alternates with single wale of reverse stitches.

The term plain rib fabric denotes a rib fabric that **does not show any pattern effect**.





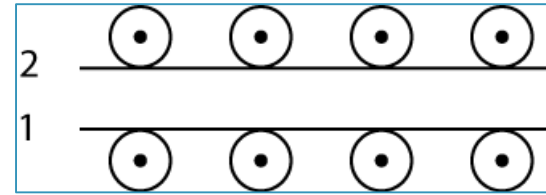
Rib-based fabrics

Purl-based fabrics

Generic name applied to weft-knitted fabrics in which **both face and reverse stitches occur in at least one wale.**

When not extended lengthwise purl fabrics often show only reverse stitches on both fabric sides.

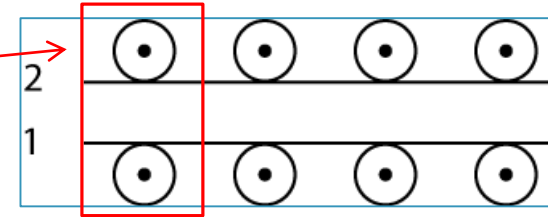
Purl fabrics are currently produced on two needle beds the tricks of which are in alignment to allow double-ended latch needles to cast off their stitches either in the one or the other direction.



1x1 purl fabric

One-by one purl fabric

Pattern repeat – 2
stitches



Weft-knitted fabric that consists of 1x1 purl courses so produced that single course of face stitches alternates with single course of reverse stitches.

The term plain purl fabric denotes a purl fabric that does not show any pattern effect.





Purl-based fabrics

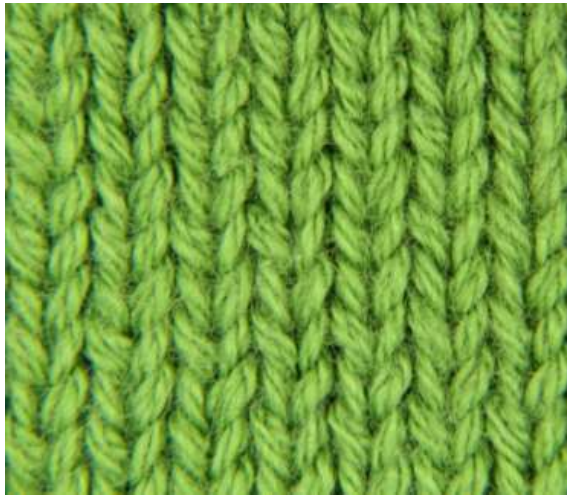
Plain or patterned knitted fabric

Plain structure of the fabric – it is the simplest structure from each structure group (*jersey based, rib based, purl based*). It is formed only from the stitches.

Patterned structure of the fabric – it is structure, in which some patterning element is used to produce a pattern. The patterns of the knitted fabrics can be divided into two groups:

- Structural motifs of a pattern
- Colour motifs of a pattern





Plain structures



...



...



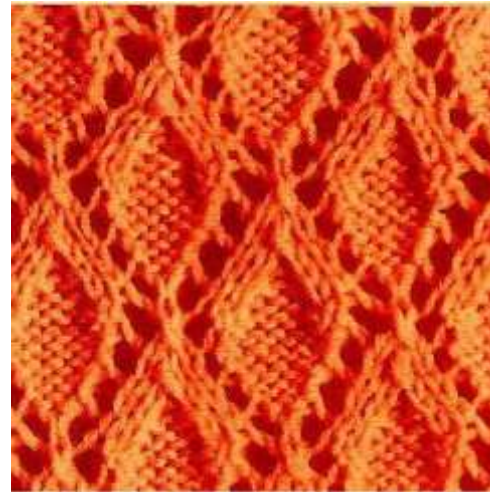
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Patterned structures

Structural motifs of a pattern

The motif of a pattern is created by certain structure of the fabric:

- Drop-stitch pattern
- Knop stitch pattern
- Weaves pattern
- Rib pattern
- Cable stitch pattern
- Lace stitch pattern



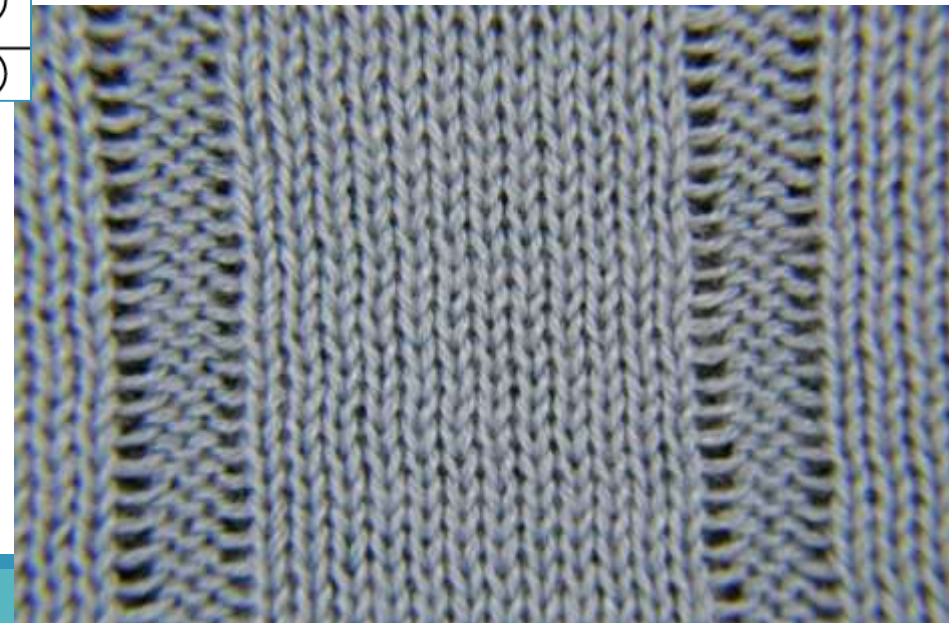
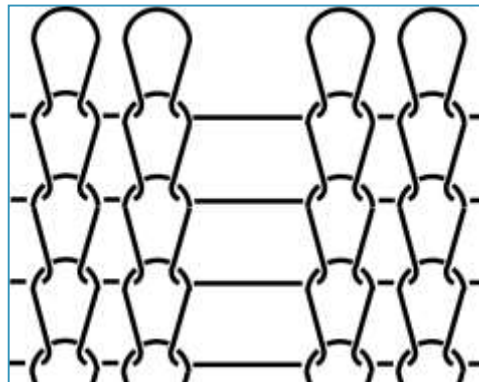
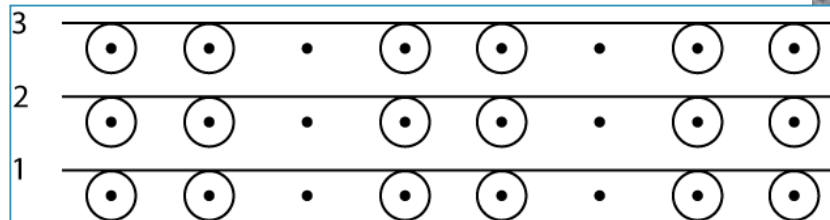
Lace stitch
pattern



Cable stitch
pattern

Drop stitch pattern

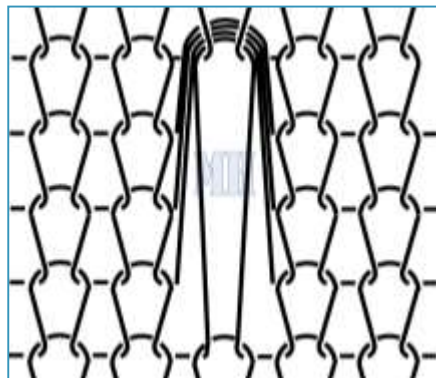
The strip of loose yarns in the knitted fabric that replaces the missing wale (or wales) of stitches.



Knop stitch pattern

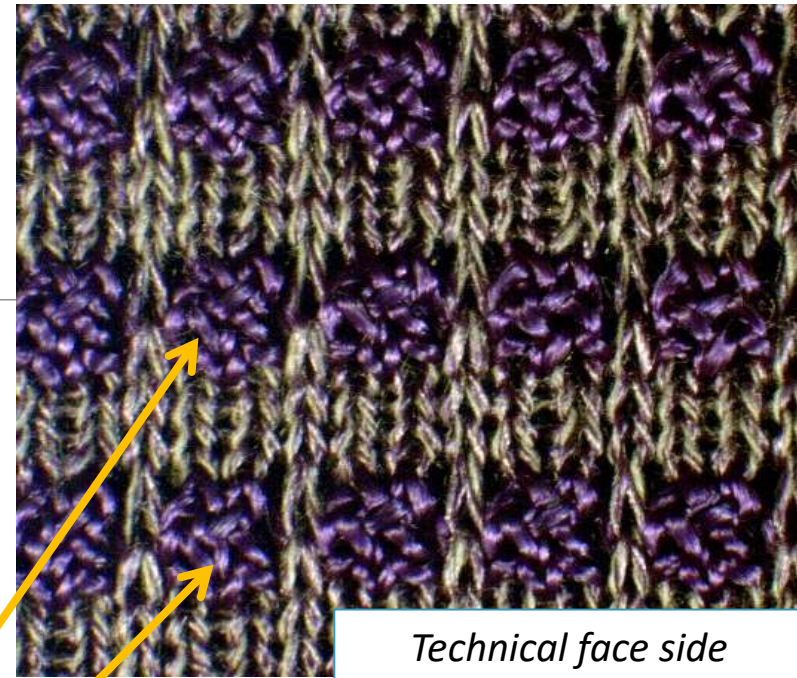
Weft-knitted, sometimes two-colour, jersey-based (*usually*) fabric that exhibits a knop effect on the technical face side.

Due to the repeated tuck loops, there is a camber of knits.

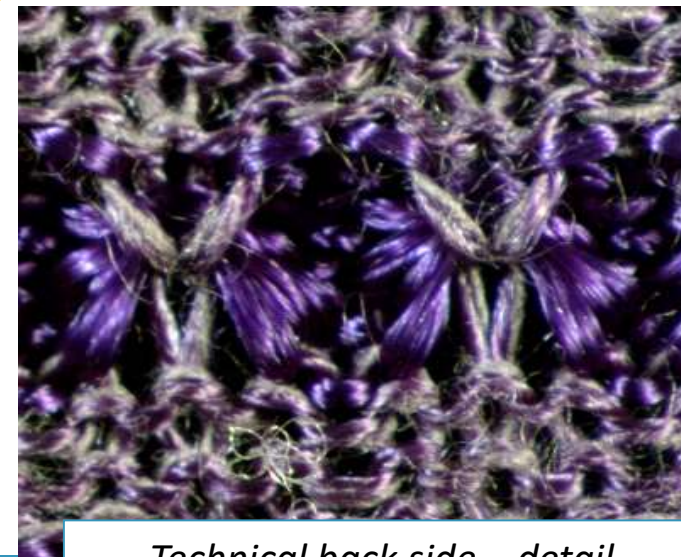


Repeated tuck loops

knops



Technical face side



Technical back side – detail

Pineapple texture fabric

An example of jersey-based knop fabric, known as **pineapple texture fabric** is shown in the illustration in which four tuck loops are accumulated in every fourth wale, the following knops being in staggered arrangement to the previous and each group of knops being separated by two plain jersey courses in a twelve course repeat cycle.

☐ V - Face stitch

☐ ● - Tuck loop



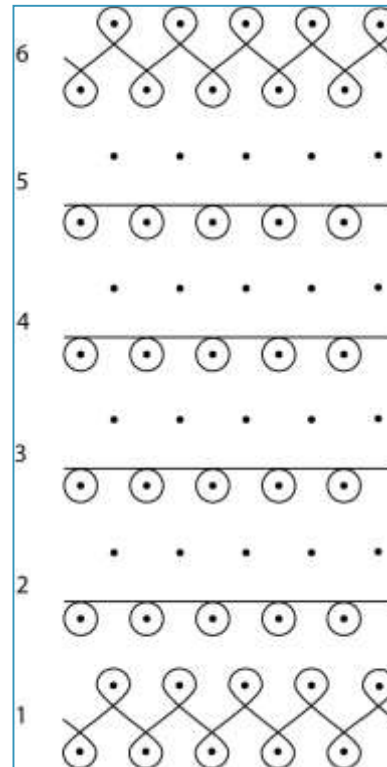
12 courses

V	V	V	●	V	V	V	V
V	V	V	●	V	V	V	V
V	V	V	●	V	V	V	V
V	V	V	●	V	V	V	V
V	V	V	V	V	V	V	V
V	V	V	V	V	V	V	V
V	●	V	V	V	●	V	V
V	●	V	V	V	●	V	V
V	●	V	V	V	●	V	V
V	V	V	V	V	V	V	V
V	V	V	V	V	V	V	V



Weaves pattern

The pattern is created by the groups of jersey courses (*or parts thereof*), which protrude on the fabric surface.



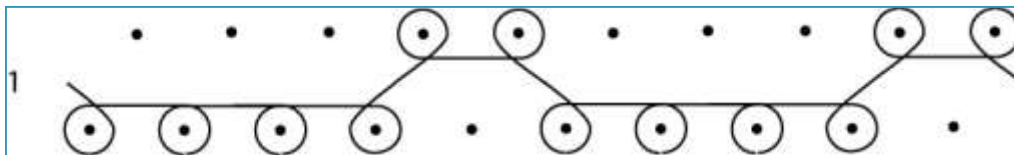
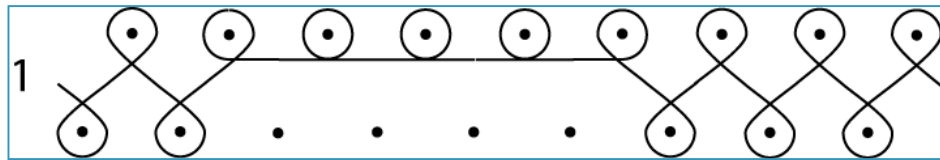


Jacquard weaves pattern

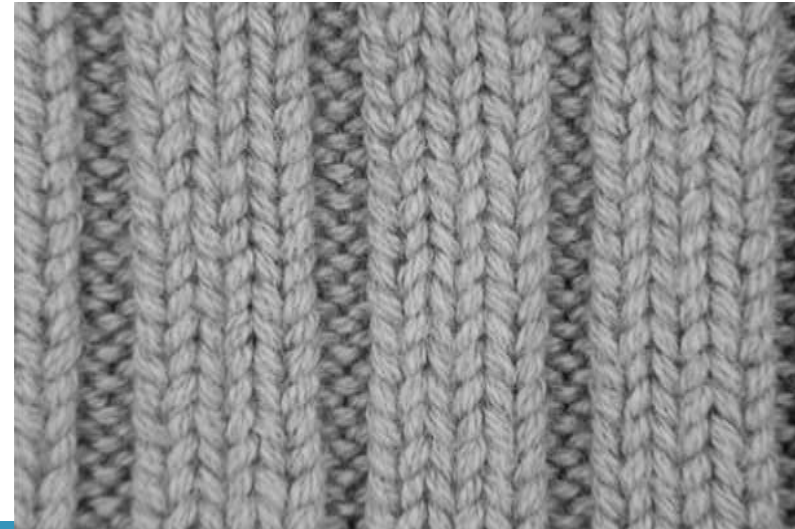
Rib pattern

The pattern is created on the rib based fabrics.

It is formed by longitudinal relief stripes that arise by alternating face and reverse wales.



Some examples

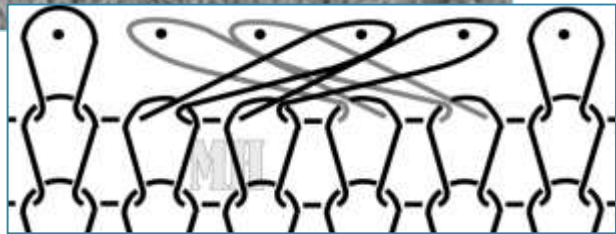
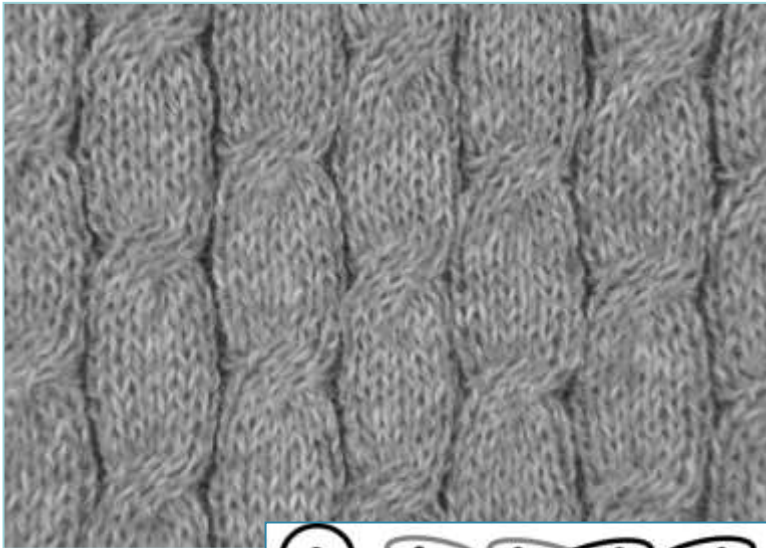




Rib pattern fabrics

Cable stitch pattern

Weft-knitted rib-based fabric that contains cable stitches.



Mutual crossover two groups of stitches



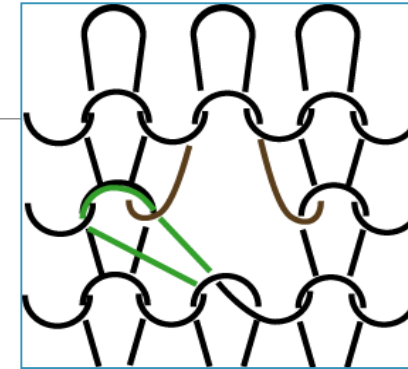
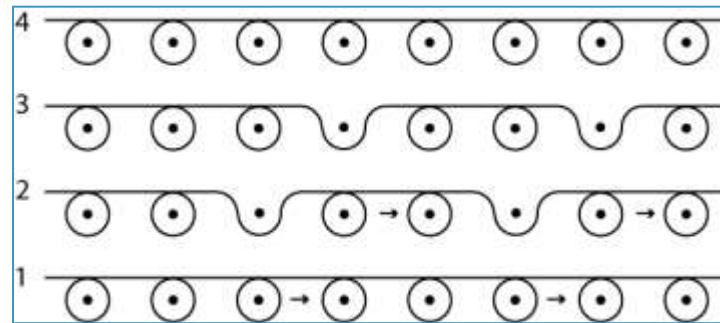
ING. MARIE HAVLOVÁ, PH.D.



Cable stitch
patterns

Lace stitch pattern

The pattern consists a small holes and hills, which result from lace stitches.



Lace stitch

Lace stitch – a unit that consists of a needle loop that has been transferred from its normal walewise position to an adjacent wale meshed in the same direction.

Rib transfer stitch – a unit that consists of a needle loop that has been transferred from its normal walewise position to an adjacent wale meshed in the opposite direction.





Lace stitch pattern

Purl jacquard fabric (*self-colour*)

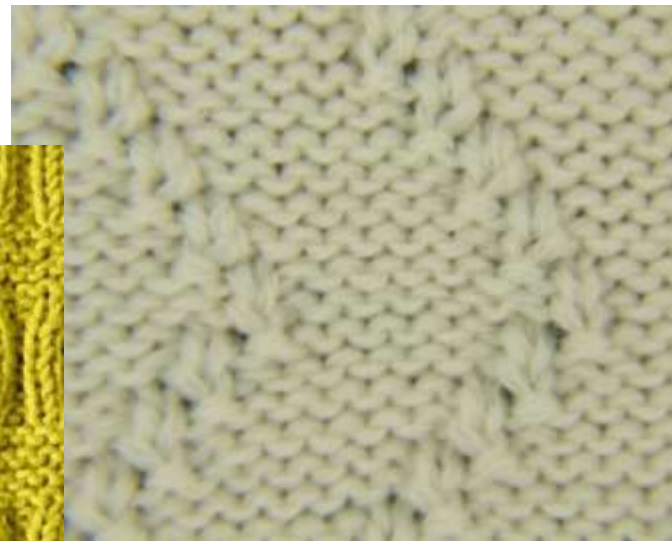
~ Fancy purl fabric

Weft-knitted purl-based fabric that shows a design motif of face stitches on a ground of purl stitches.

To produce this effect, the needles are individually selected by a jacquard device for either knitting face stitches or reverse stitches.

Held stitches or tuck-stitches may be incorporated into these designs.

These fabrics are usually in self colour.





Purl jacquard fabric



Purl jacquard fabrics

