

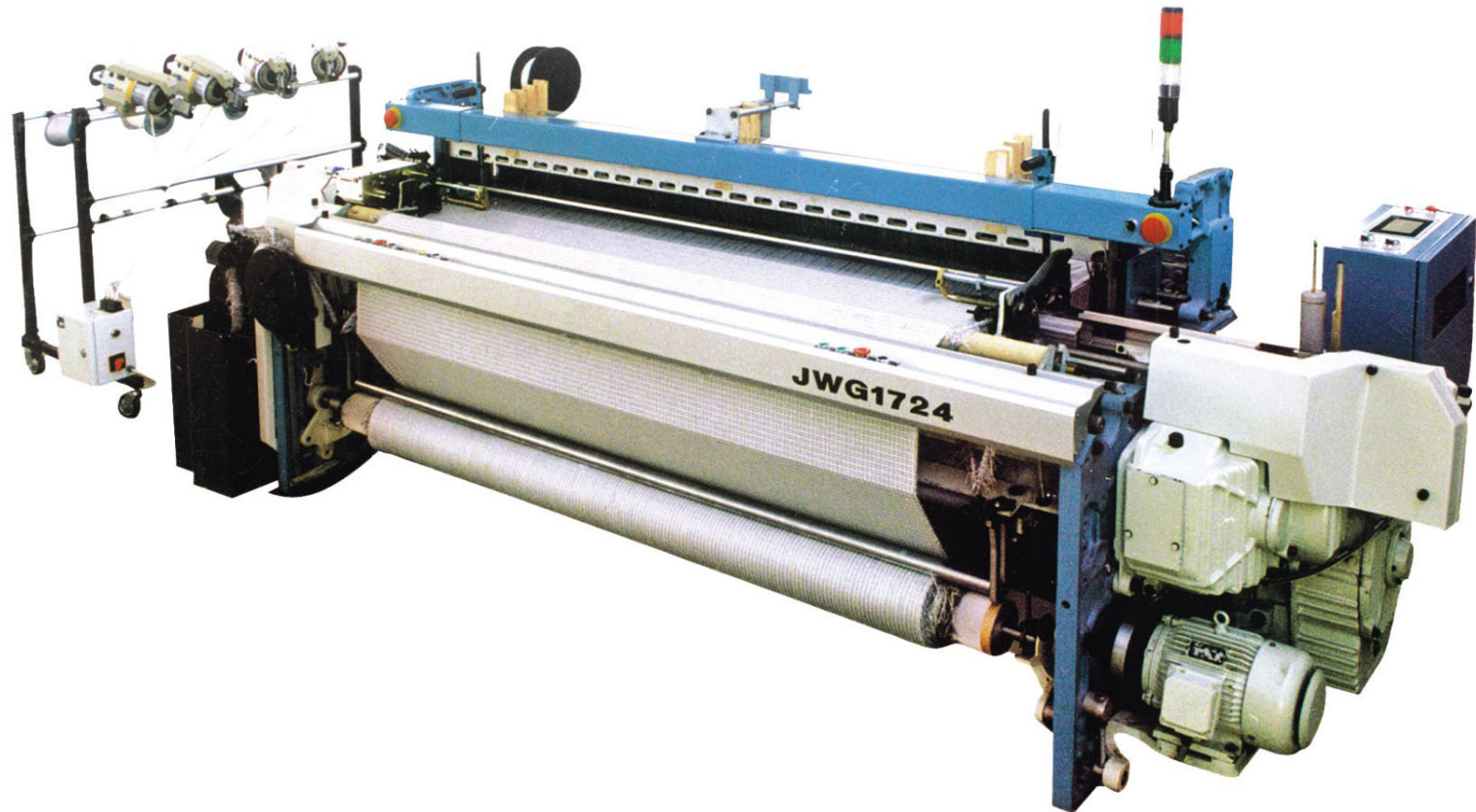
# INDUSTRIAL WEAVING

What is different compared to hand weaving?

- Speed and power of the loom:
  - it makes weaving fast
  - it emphasizes the importance of even warp take-up
  - it requires more durability from the materials (both warp and weft)
  - leaves no time for hand work
- Feeding the weft:
  - no shuttles are used - weft is weft directly from the yarn cone
- Density of the weft is adjusted in advance

# DOBBY WEAVING MACHINE

designing the pattern is quite similar to shaft looms



# JACQUARD WEAVING MACHINE

- each warp end (or a group of ends) can be controlled separately
- this allows for larger repeat sizes of the pattern
- note: dobby/shaft loom designs can be woven also on a jacquard loom!

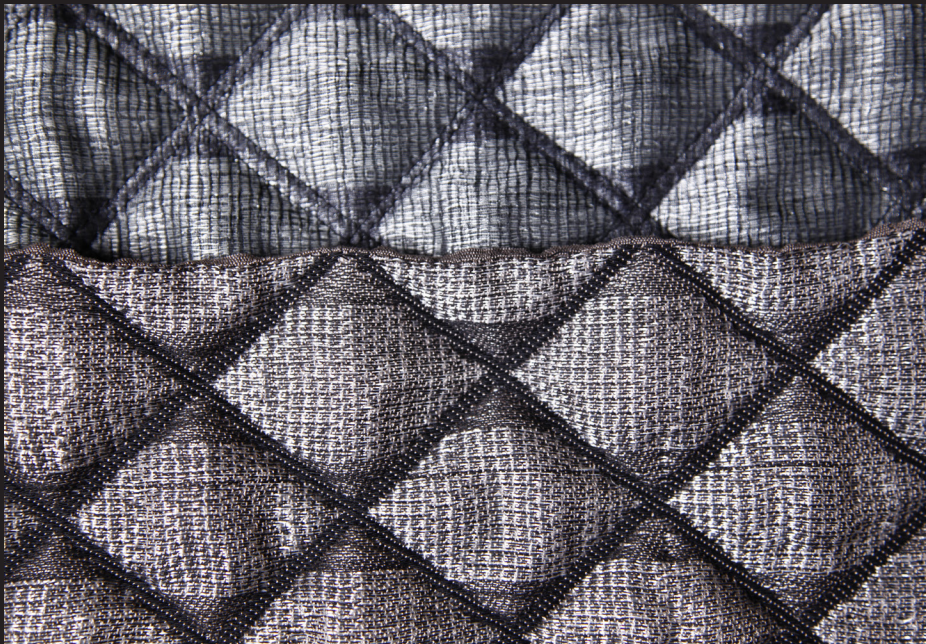




# JACQUARD DESIGN

## Sketching with fabric collage method

- the aim of this technique is to develop a sketch that resembles a woven fabric: the materials employed are suggestive of the various structures and materials that are utilised in the final woven fabric



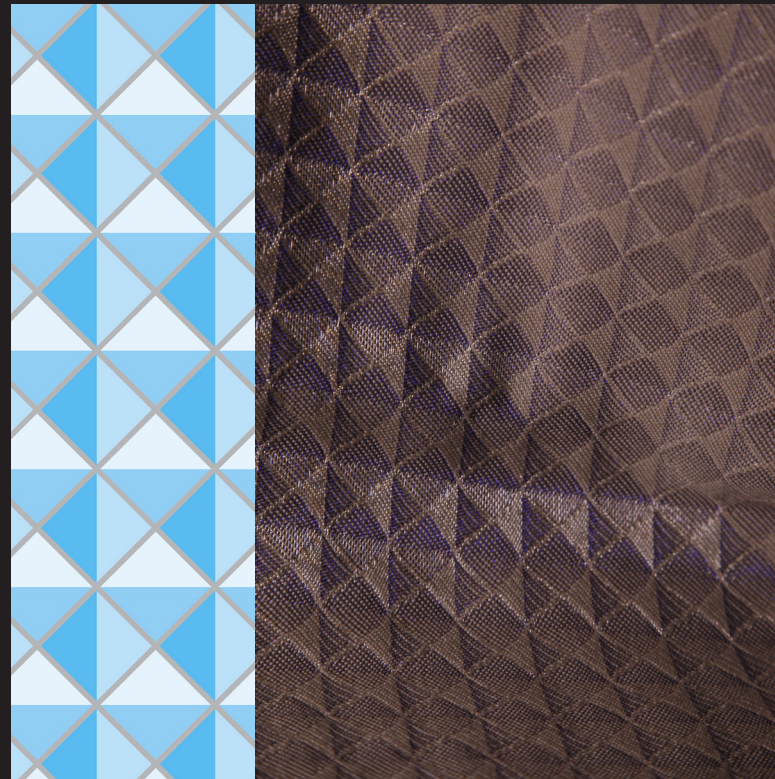


## IMPORTANT FACTORS IN THE PATTERN DESIGN FOR JACQUARD FABRICS

- The style and texture of the original surface pattern



Design Oldouz Moslemian

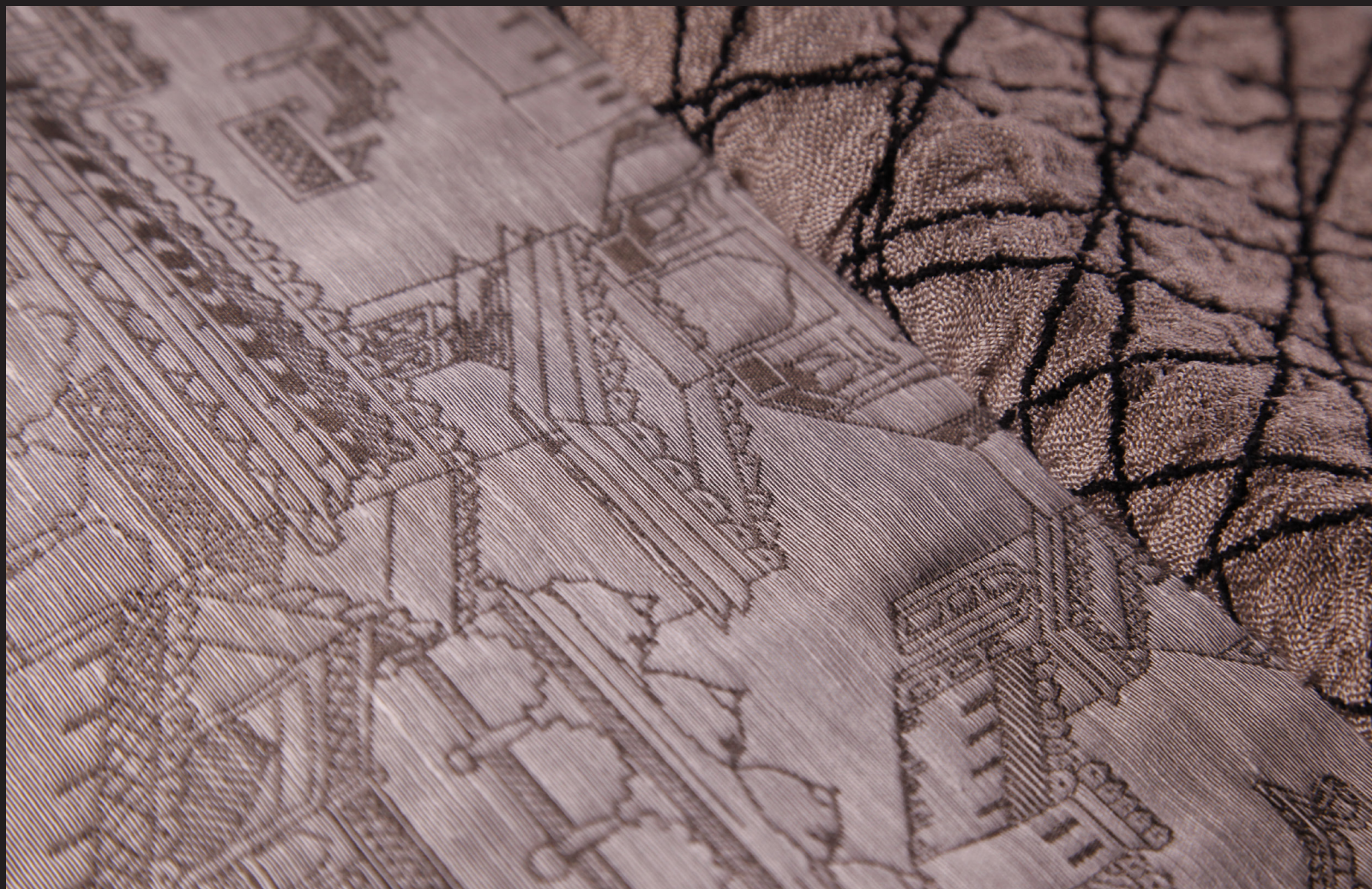


Design Emmi Pakkanen,

Photos Eeva Suorlahti



The fineness of the lines and details possible depend on the fabric density



Designs Maarit Salolainen and Maija Fagerlund, Photo Eeva Suorlahti



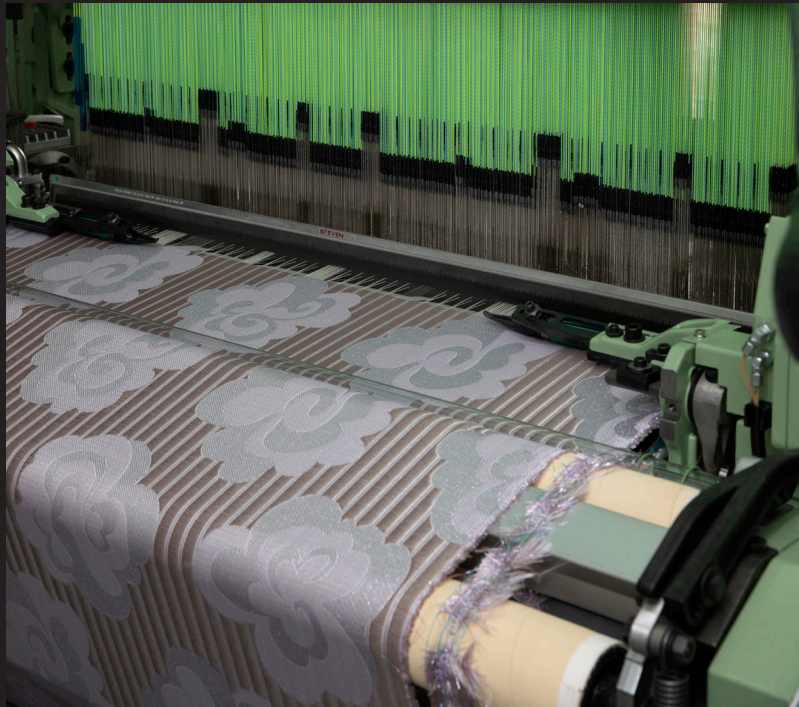
## REPEAT SIZES

- The warp is divided into units in which groups of warp ends are controlled by the same hooks, and thus, the same part of the design is repeated. The warp could be divided into 2, 3, 4 or any other number of units
- If the warp is divided into 2 units, the width of the pattern repeat is 1/2 of the width of the fabric, typically 70-80 cm
- In Aalto weaving machine the fabric width is 120 cm, and the repeat width is thus 60 cm
- Similar to shaft looms, there are principally no restrictions to the height of the repeat in jacquards.



## REPEAT SIZES

- If the warp is divided into 4 units, the width of the repeat is 1/4 of the width of fabric, commonly 35-40 cm (image on left)
- Lapuan Kankurit weaves tea towels with a loom that divides the warp in 3 units and has a cutter installed between each repeat (image on right)



Design Netta Törmälä, Photo Eeva Suorlahti



Weaving in Lapuan Kankurit, Photo Maija Fagerlund



## REPEAT SIZES

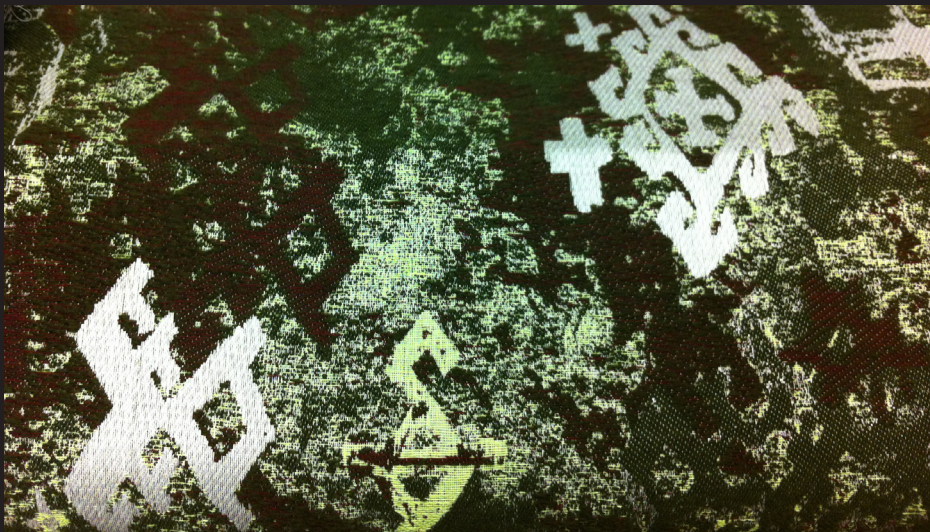
- In some looms each warp end can be controlled separately, allowing the width of the pattern repeat to be as wide as the fabric width
- These looms are sometimes referred to as jumbo jacquards, and they are commonly used in weaving products such as blankets, as well as unique art pieces
- Also hand-operated jacquard looms, such as TC-2 looms, work on this principle





## COMPOSITION OF THE DESIGN / WARP TAKE-UP OF THE WEAVE STRUCTURES:

- The word take-up refers to the measure of warp yarn consumed when a structure is woven
- If the warp is frequently intersecting with the weft, the take-up of the structure is high / if the warp has fewer intersections with the weft and is mainly floating in the structure, the take-up is low
- The overall warp take-up of an industrially woven design should be kept fairly even: bindings with relatively similar warp take-up should be applied in one design. In designs with variation in take-up of the weaves, the overall warp take-up could be balanced by creating an even composition of the motifs.



Tiia Siren, Photo:Tiia Siren

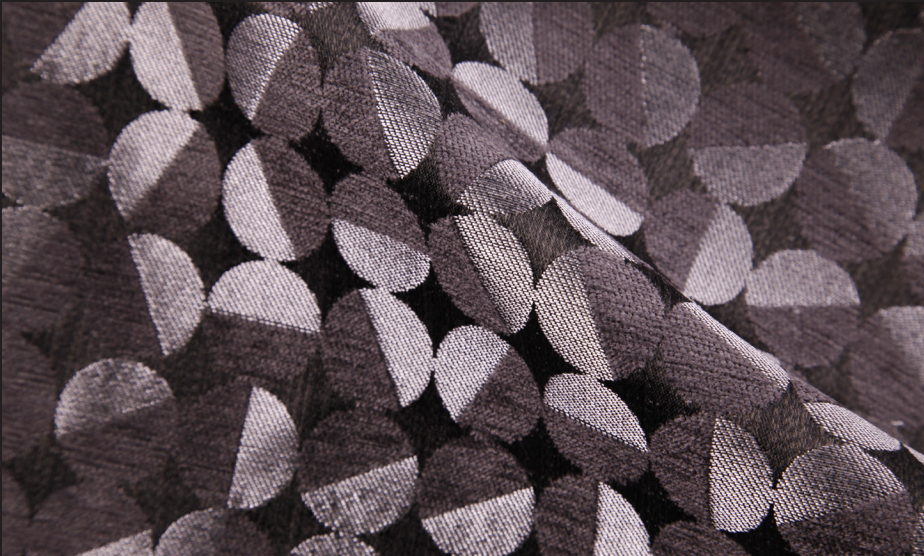


Eveliina Netti, Photo: Eeva Suorlahti



## COLOURS

- The colour work in jacquards differs from that of printed fabrics, but is similar to the colour design in all other woven fabrics
- Each clearly distinctive colour used in jacquards requires its own specific weft or warp system - therefore the more colourful the fabric is, the thicker it becomes
- However, as all warp and weft yarns are interlaced in the weave structures, it is easy to achieve mixtures of colours that create an illusion of additional tones existing in the design



Design Maarit Salolainen, Photo Eeva Suorlahti



Design Teija Vartiainen, Photo Eeva Suorlahti



- If two elements of a surface pattern are never intersecting in a same horizontal line, they can be woven with two different weft colours without adding more weft systems.

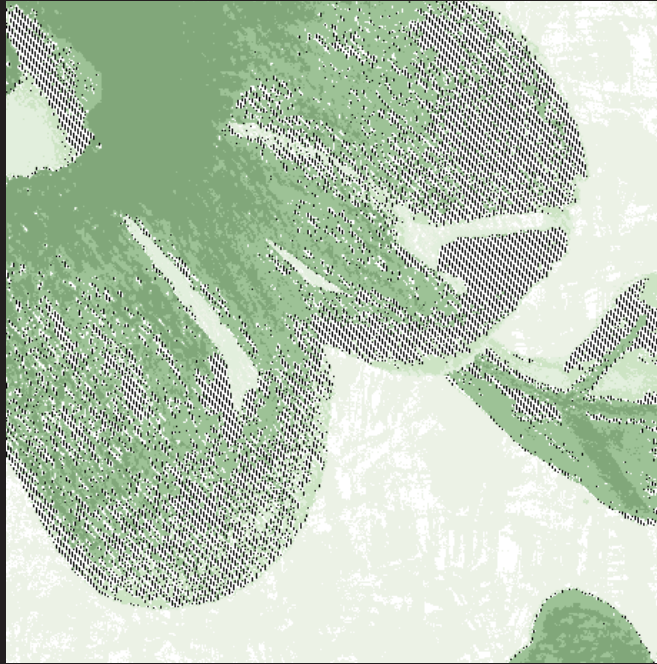


Design Aoi Yoshizawa, Photo Eeva Suorlahti



# PREPARING A JACQUARD FILE

- First, colours in the pattern design are separated
- Then, each colour is replaced with a weave structure



# JACQUARDS WITH ONE WARP AND ONE WEFT SYSTEM

- In damasks, only one set of warps and one set of wefts are interlacing in each weave structure of a design -> only two clearly distinctive colours/yarn qualities can be utilized in it
- Any basic or derivative weave supporting the idea of a design can be used
- Plain weave has a very high warp take-up compared to other structures and can easily create an uneven warp take-up in the fabric, if used as a structure for large or unevenly placed elements. On the other hand it could create interesting effects when used in smaller and evenly placed elements.





Shaded satins are often used in classical damasks



Design Maija Fagerlund, Photo Eeva Suorlahti

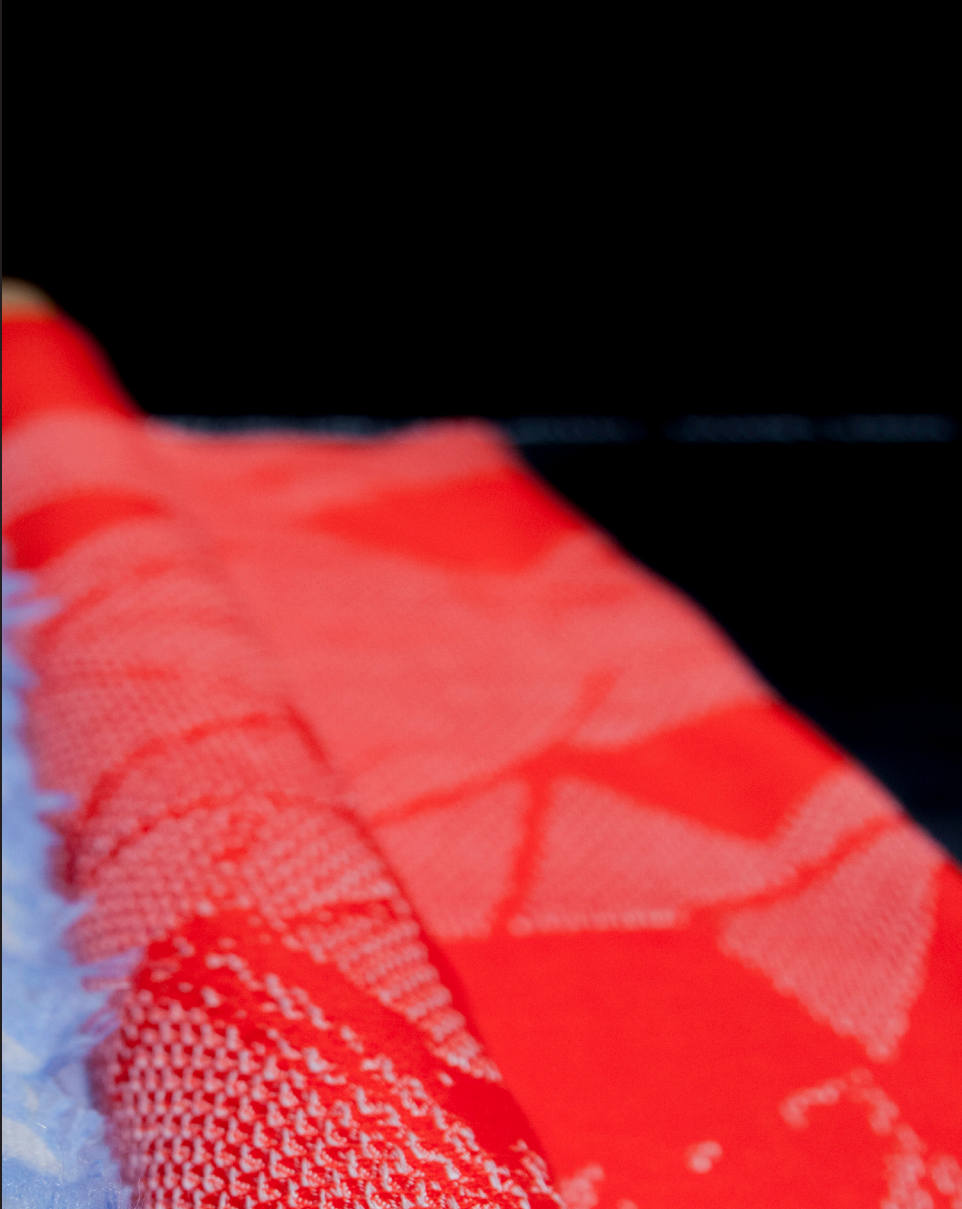


Dora Jung is a pioneer of damask technique in Finland.

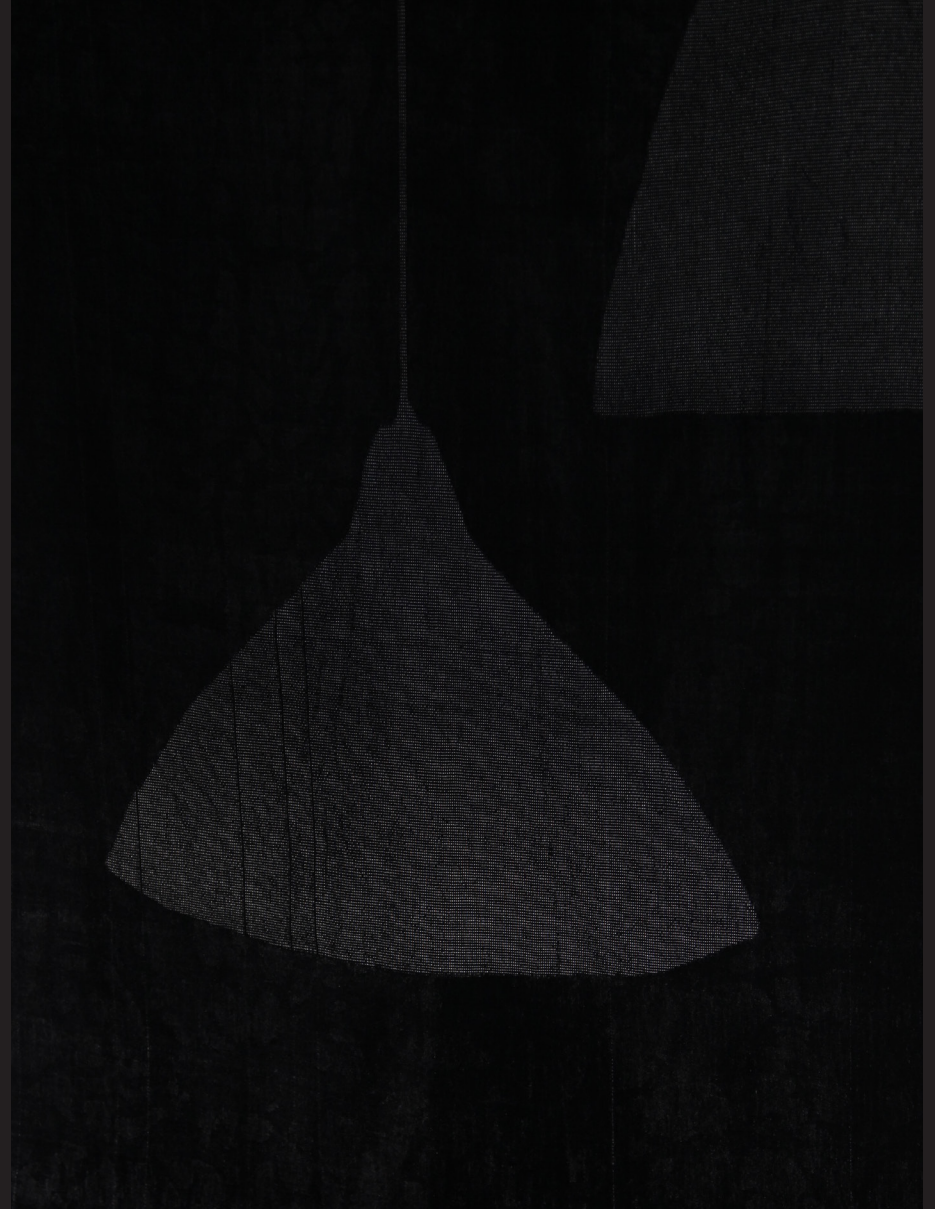




Also more structural ideas might be used in fabrics with one warp and one weft system: Honeycomb (left) and mock leno combined with satin (right)



Design Miisa Lehto, Photo Eeva Suorlahti



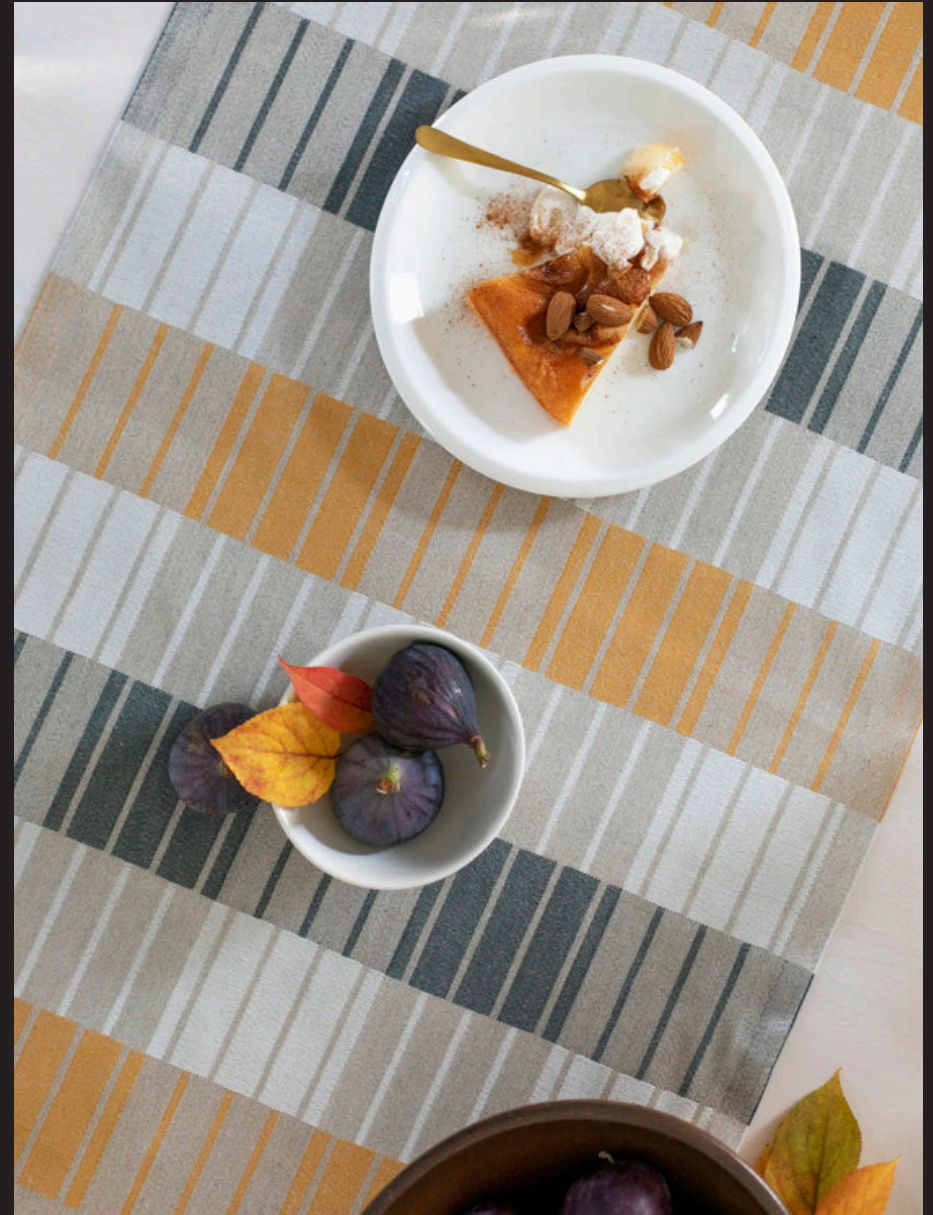
Design Outi Lehto, Photo Eeva Suorlahti



Additional colors might be inserted by weaving weft stripes



Design Kaisa Karawatski, Photo Eeva Suorlahti



Helmi Liikanen: Sointu, Lapuan Kankurit; Photocredits Lapuan Kankurit  
Accessed on 12.12.2022. Retrieved from  
<https://www.lapuankankurit.fi/fi/sointu-keittiopyyhe>



## SOURCES & FURTHER READING:

Fagerlund, M. (2022) Jacquards – Boosting the Patterns. Interwoven: Exploring Materials and Structures. Salolainen, M. (ed.).  
Aalto ARTS Books, Espoo. pp. 335-359

Jacquard design: Holyoke, J (2013) Digital Jacquard Design

Damasks: Salolainen, M (2022) Interwoven: Exploring Materials and Structures  
pp. 303, 310

Dora Jung damasks:

[https://www.lapuankankurit.fi/sites/default/files/pdf/dorajung\\_uk\\_fr.pdf](https://www.lapuankankurit.fi/sites/default/files/pdf/dorajung_uk_fr.pdf)