

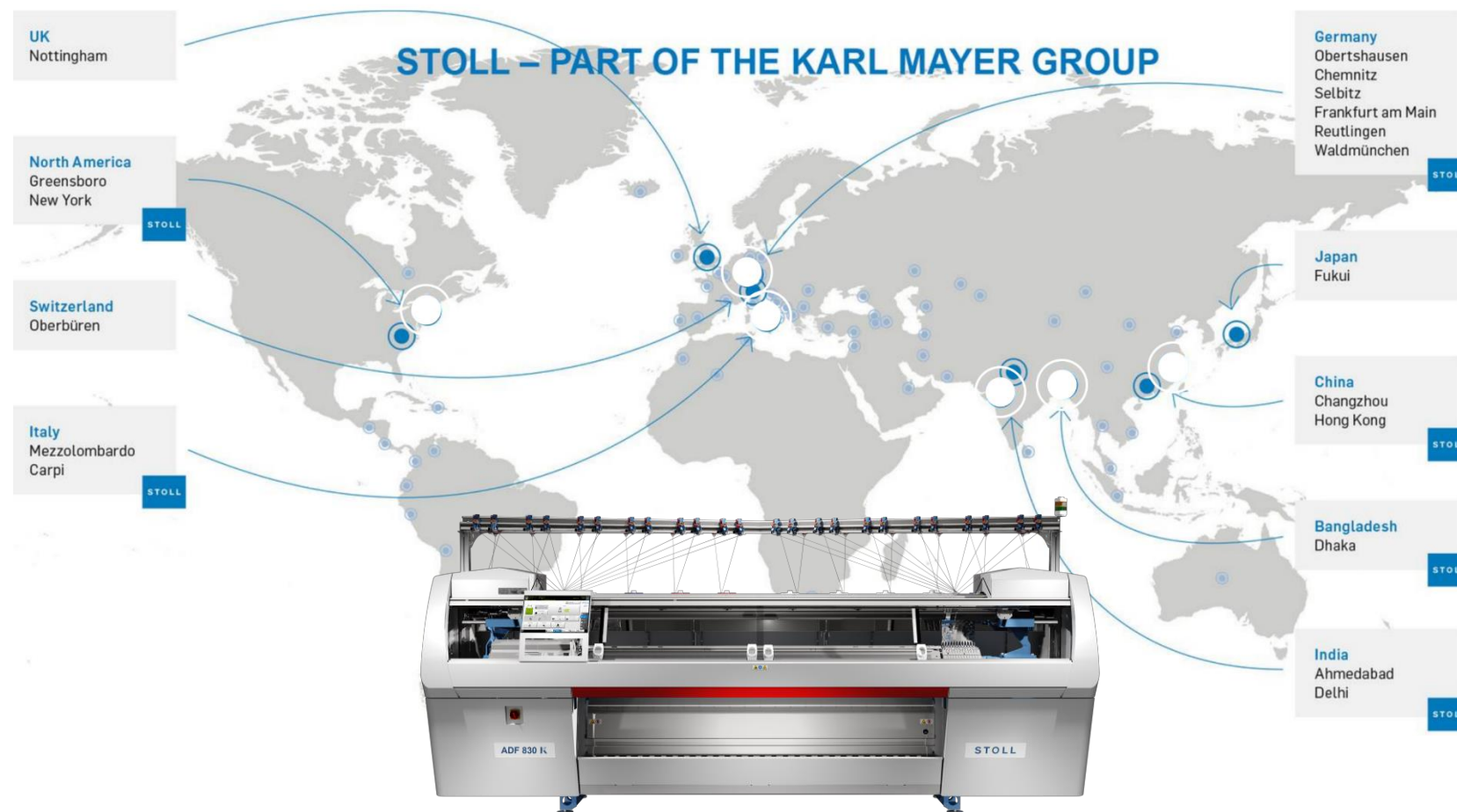


**k.innovation CREATE DESIGN**  
Digital Knitwear Design Development

# STOLL AT A GLANCE

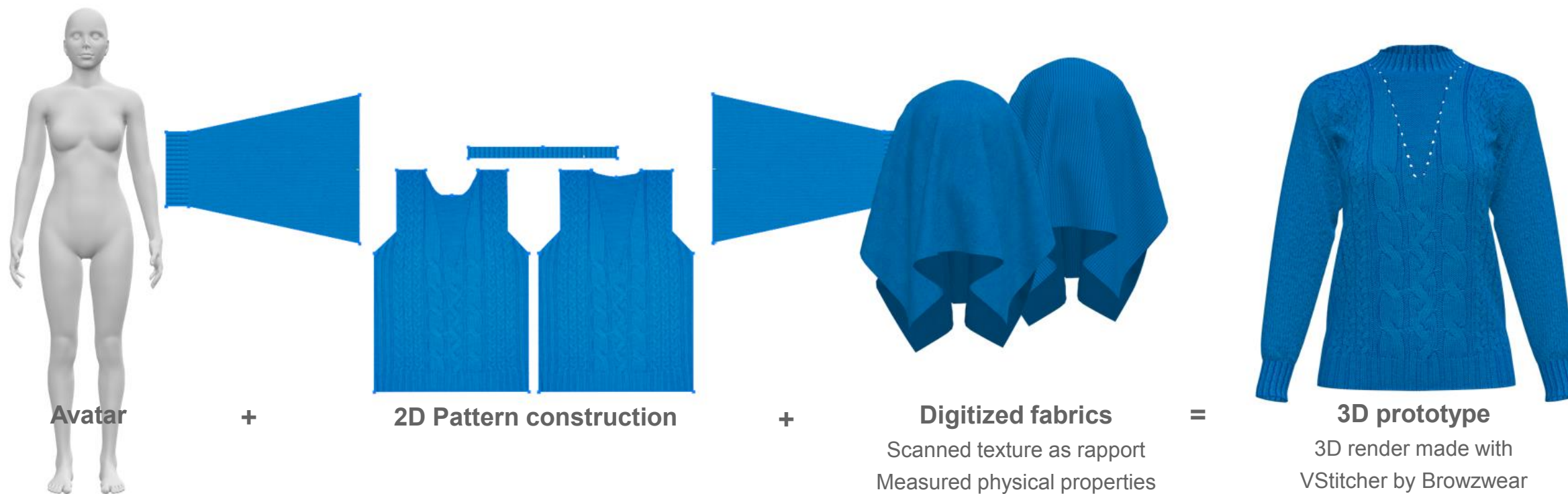
## Overview

- Oldest manufacturer worldwide of electronically controlled flat knitting machines and patterning software
- Founded in 1873 by Heinrich Stoll in Riedlingen, Germany
- 4 branch offices and agents in more than 80 countries worldwide
- Production in Germany and China
- Part of the Karl Mayer Group since 2020



# 1 Introduction

## 1.1 Challenges and requirements of virtualizing flatknitted Fully Fashion garments



### Challenges of virtualizing flatknitted garments

- A physical sample of every knitwear structure would be required for scanning and using it for 3D prototyping
- No visibility of stitch decrease and fashion marks
- Unrealistic stitch transitions between different knit structures
- Divergence between resolutions of fabric repetitions and resulting difference concerning stitch density
- Link to physical sampling/ production?

# 1 Introduction

## 1.1 Challenges and requirements of virtualizing flatknitted Fully Fashion garments



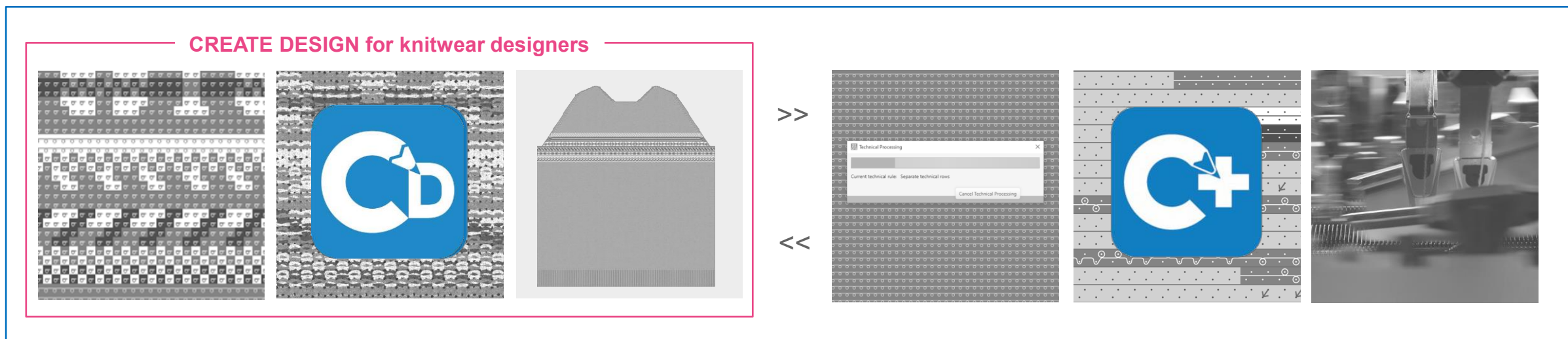
### Requirements of virtualizing Fully Fashion garments

- The shape of a pattern is directly connected with its knitting techniques to ensure the typical optics of fully fashion garments → But scanning FF is not feasible and excludes 3D technology from the knitwear design process!
- Digital tool for creation of knittable shapes
- Digital tool for stitch creation and stitch simulation to link the knitwear design and development process with 3D prototyping and connecting it with physical sampling



# 1 Introduction

## 1.2 Our solution



Since 1st of July 2020, we are officially part of the KARL MAYER Group. Together with the Business Unit KM.ON, we combined our expertise and creativity to develop software solutions for digitizing the knitwear design and development process.

Jointly, we invented k.innovation CREATE DESIGN for designers and CREATE PLUS for knitting technicians. These software products focus on speeding up the design-to-market workflow. In this context, our solutions can also provide data for virtual sampling with external 3D software.

## 2 k.innovation CREATE DESIGN

### 2.1 Key Features Overview

#### Shape Development Integrated Shape & Grading Tool



- Integrated shape library
- Option to create own shapes
- Size chart



- Option for fast grading



- Import of DXF-shapes
- Export of DXF-shapes for external software, e.g. 3D

#### Stitch Development Simple and intuitive Interface



- Stitch library
- Jacquard generator
- Color reduction
- Colourway Generator



- Design support through technical checks



- From design project to technical program
- From technical program to design project

#### Stitch and Yarn Simulation Fabric View and Yarn Explorer



- Digital yarn creation based on optical parameters
- Yarn library



- Stitch simulation with distortion



- Export of stitch simulation as texture and maps images for simulation in external 3D software

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### 2.2 Shape Development & Grading

**Measures**

	Label	32 cm	34 cm	36 cm	38 cm	40 cm	42 cm	44 cm
1	Body length from high point shoulder	58	60	62	64	66	68	70
	‡ Back	58	60	62	64	66	68	70
	‡ Front	58	60	62	64	66	68	70
2	Breast width distance from high point shoulder	26	26.5	27	27.5	28	28.5	29
3	Breast width	48	50	52	54	56	58.5	61
4	Waistband height	5	5	5	5	5	5	5
5	Width above waistband/ bottom edge	46	48	50	52	54	56.5	59
6	Neck horizontal	19	19	20	20	21	21	22
7	Neck drop front	18	18	18	18	18	18	18
8	Neck drop back	3	3	3	3	3	3	3
9	Shoulder	56	58	60	62	64	66.5	69
10	Shoulder slant	7	7	7	7	7	7	7
11	Sleeve length from C.B./Raglan	76	77	78	79	80	81	82
12	Muscle width	16	16.5	17	17.5	18	18.8	19
13	Sleeve edge	7.5	8	8.5	9	9.5	10	10
14	dist.of sleeve width from edge	20	20	20	20	20	20	20
15	sleeve width	12	12.5	13	13.5	14	14.5	15
16	Cuff height - Bundhöhe im Ärmel	5	5	5	5	5	5	5
17	Collar height C.B - Kragenlänge	1.5	1.5	1.5	1.5	1.5	1.5	1.5

**Formulas**

	Label	32 cm	34 cm	36 cm	38 cm	40 cm	42 cm	44 cm

Several presets of shapes/2D blocks

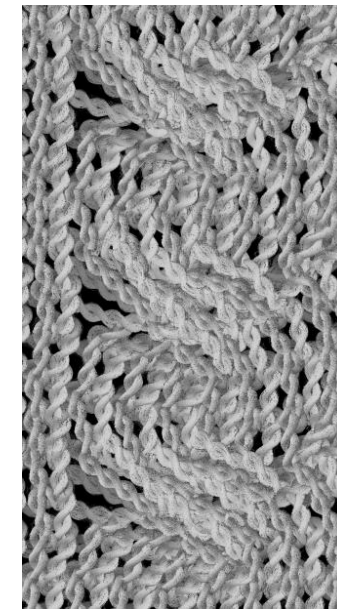
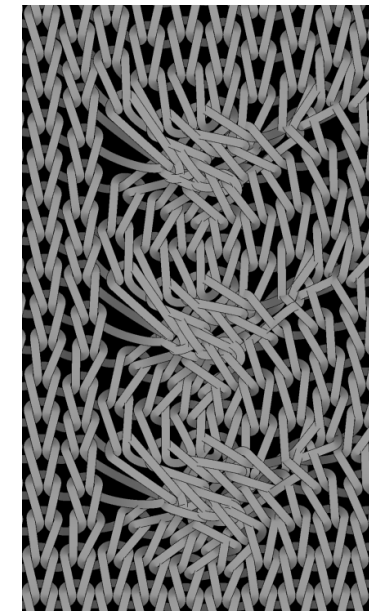
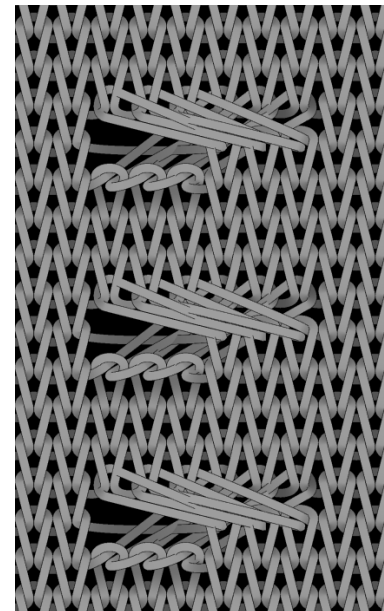
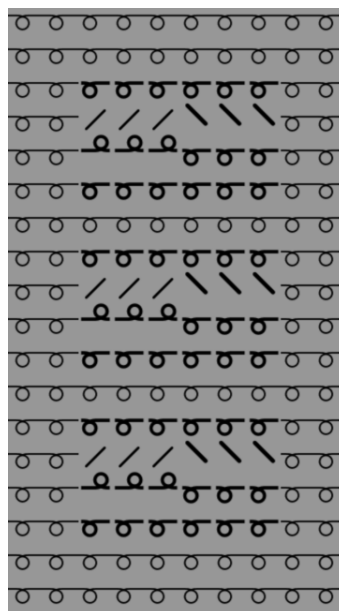
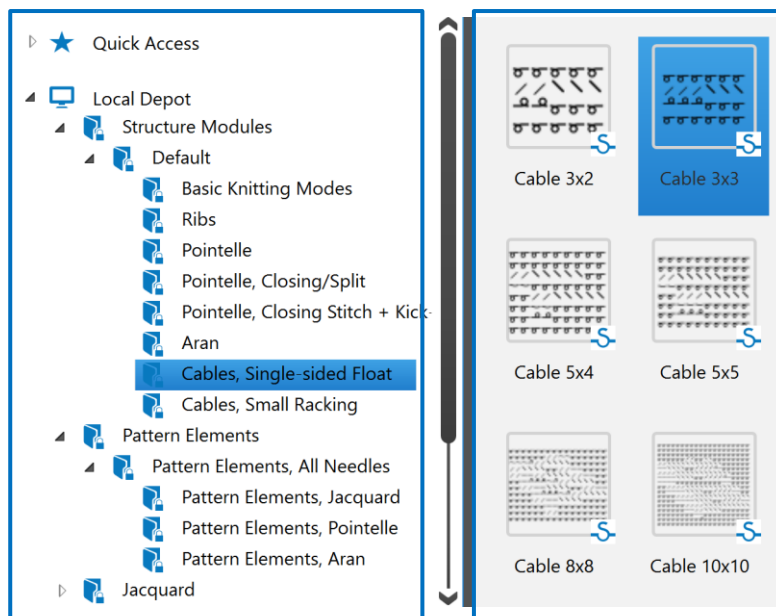
Possibility for individual shape development and modification

Option for fast grading

Data interface for import and export of DXF shape files

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### 2.3 Stitch Development



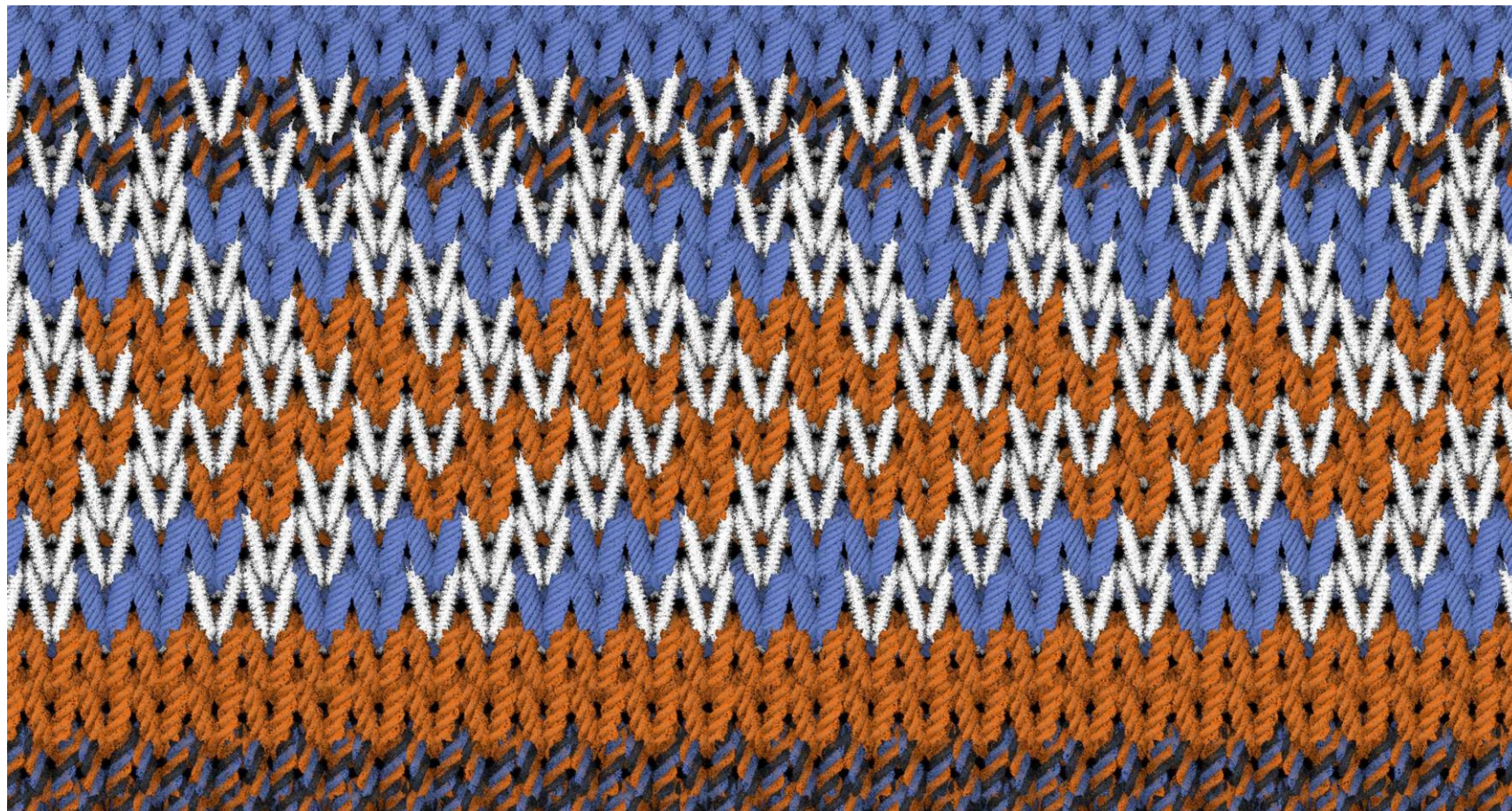
- Stitch library with various basic and advanced stitch constructions
- Technical view with stitch symbols
- Simple stitch simulation view
- Stitch simulation with stitch distortion
- Stitch simulation with stitch distortion and digital yarns



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### 2.4 Digital Yarn Creation

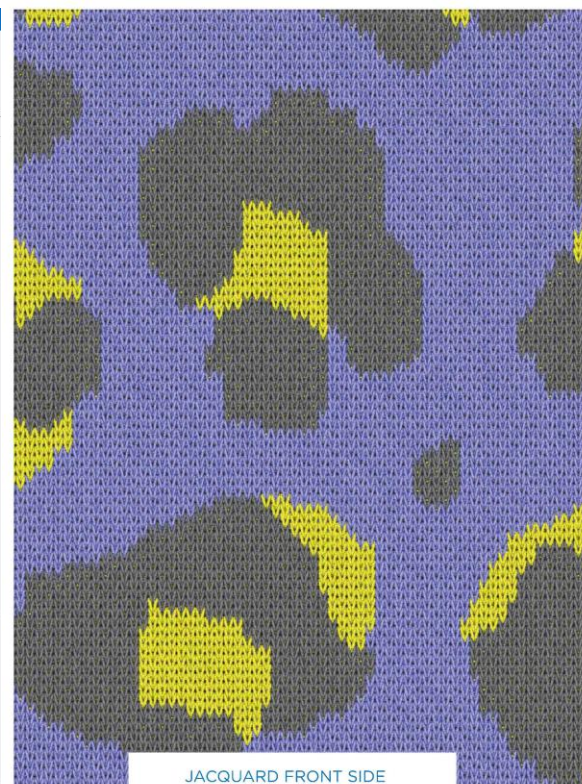
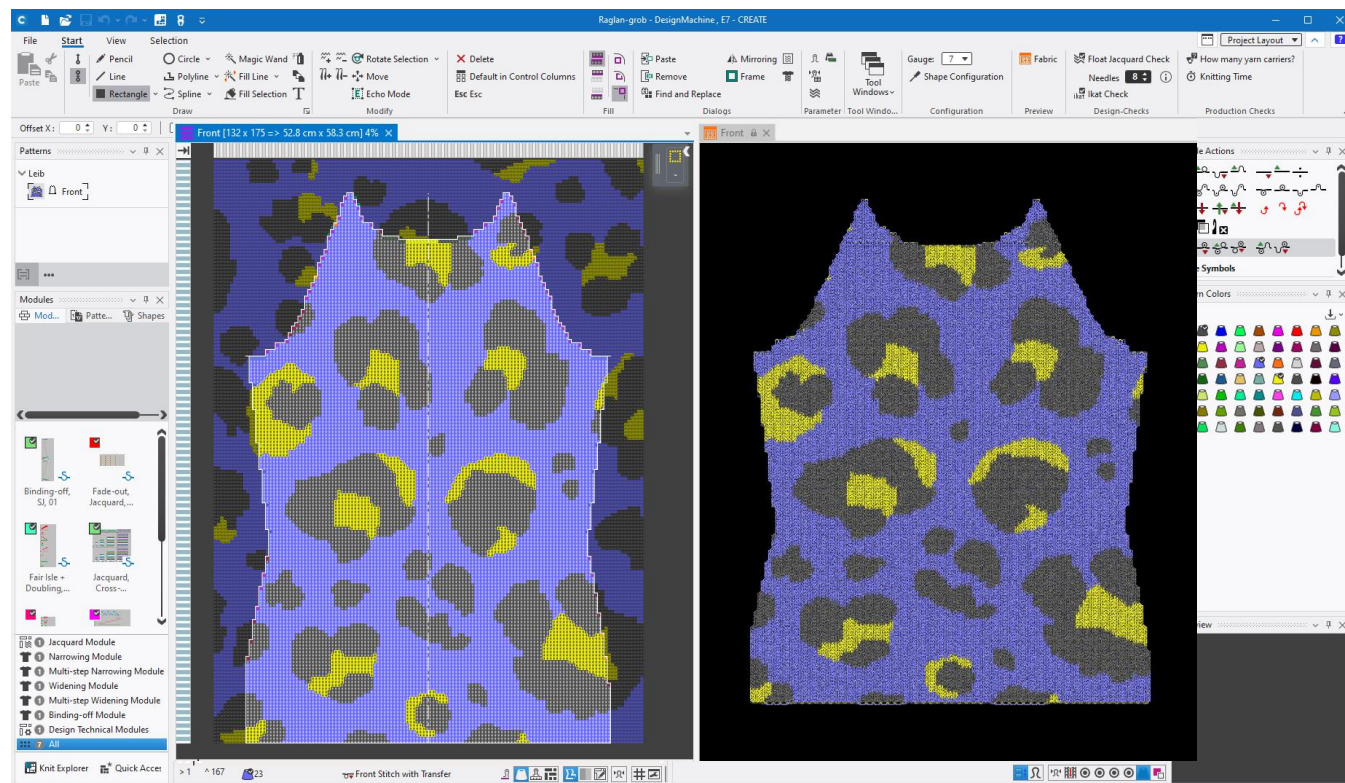
- Yarn library with standard and a range of effect yarns which will be expanded in future versions
- Creation of own yarns based on optical parameters with real-time preview
- Easy adjustments of yarn optic via e.g. thickness, twist, plys, colours etc.



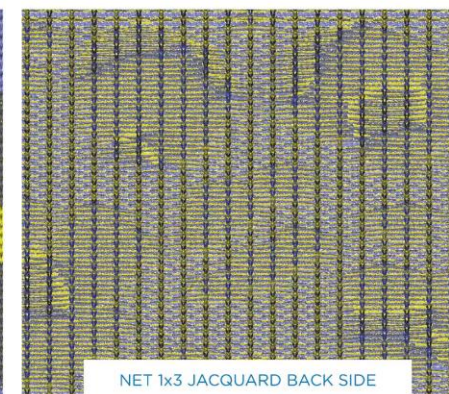


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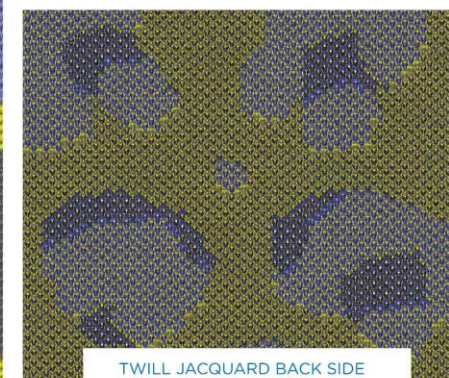
### 2.5 Jacquard Generator



JACQUARD FRONT SIDE



NET 1x3 JACQUARD BACK SIDE



TWILL JACQUARD BACK SIDE

- Import of shape and artwork

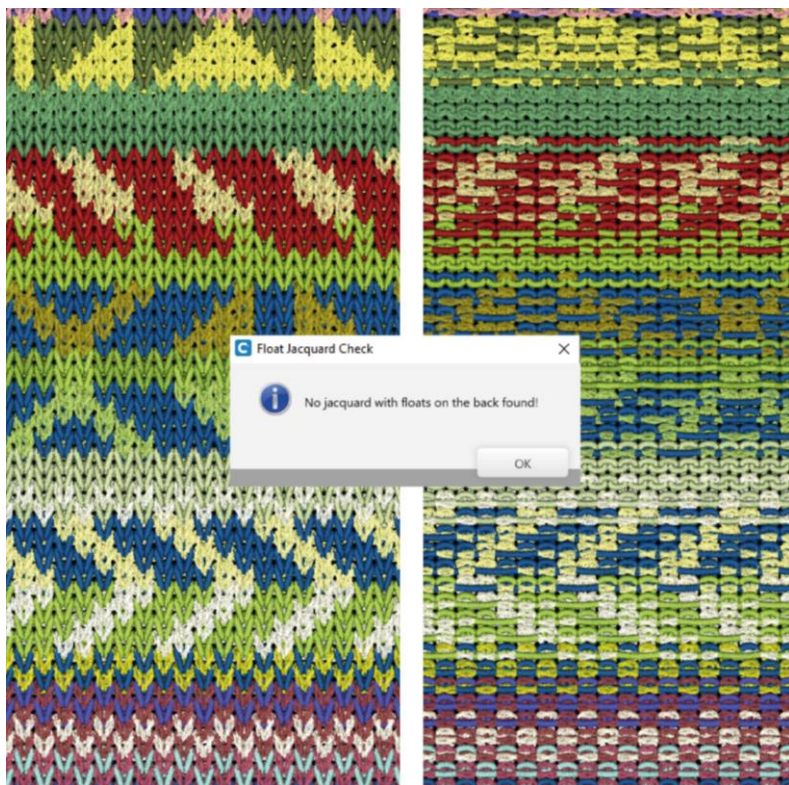
- JACQUARD  
stitch simulation - front side

- JACQUARD  
stitch simulation - back side



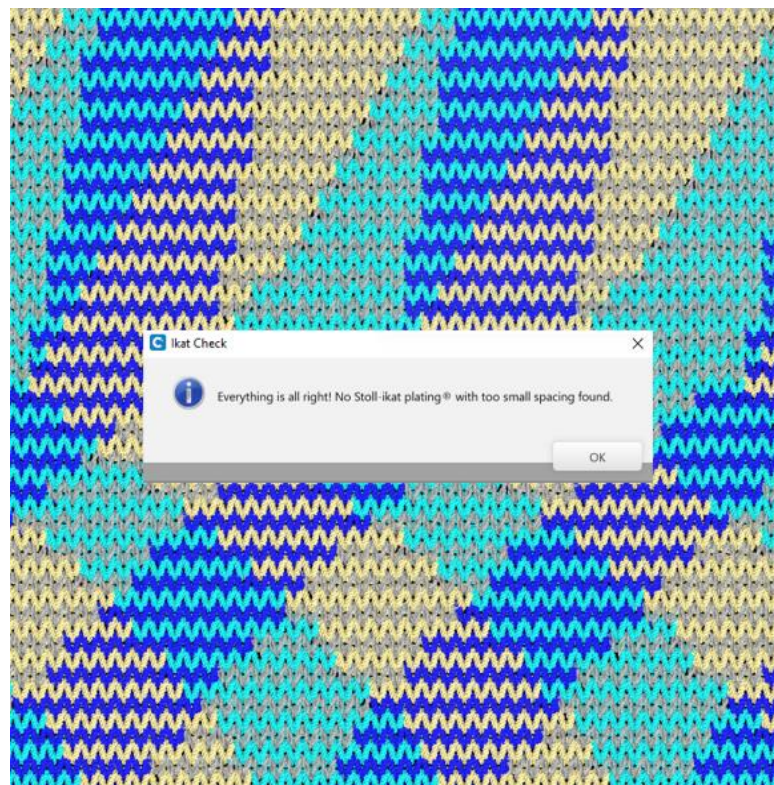
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### 2.6 Design Checks



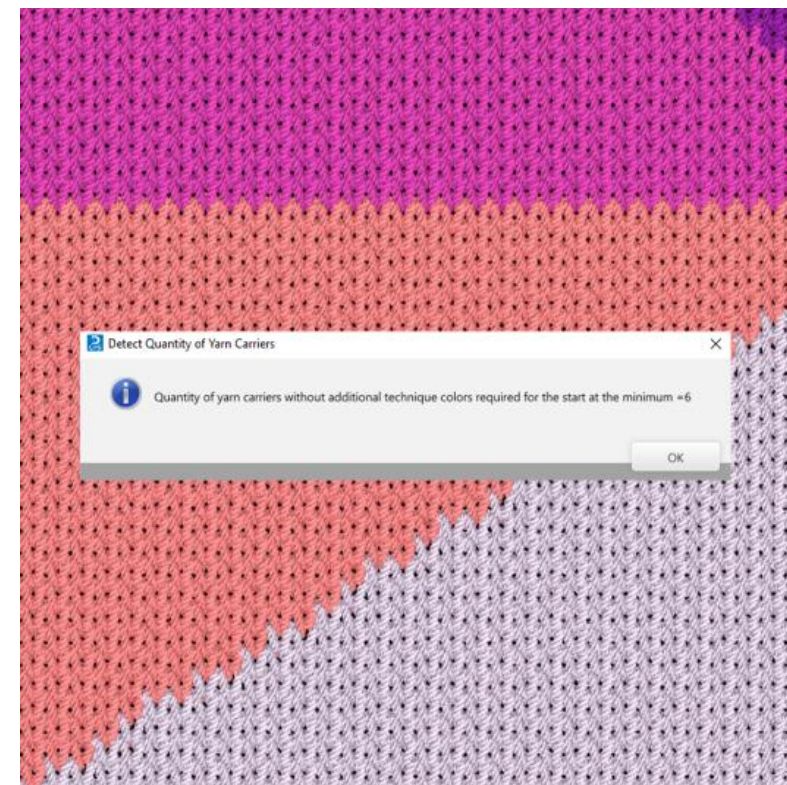
#### FLOAT JACQUARD

Check the maximum 1 inch length of floats



#### STOLL-IKAT PLATING

Check the minimum 2 inch distance  
between colour fields



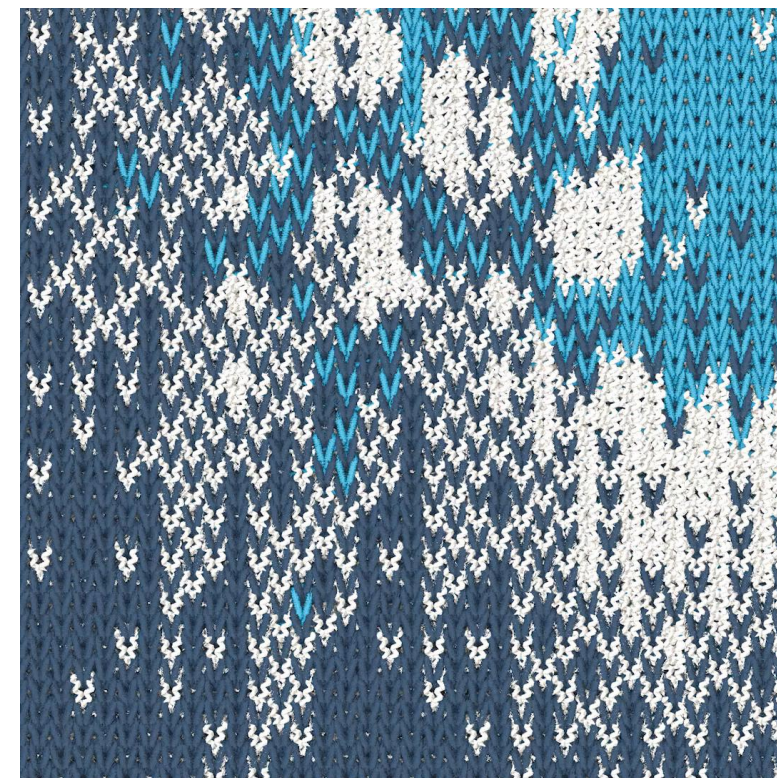
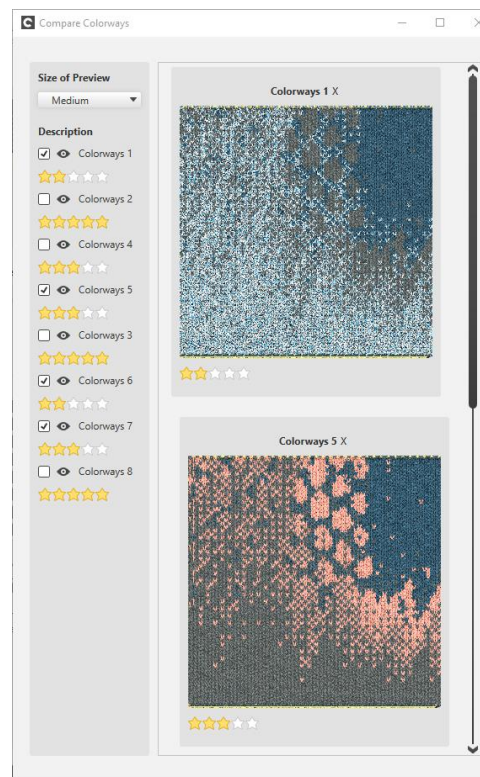
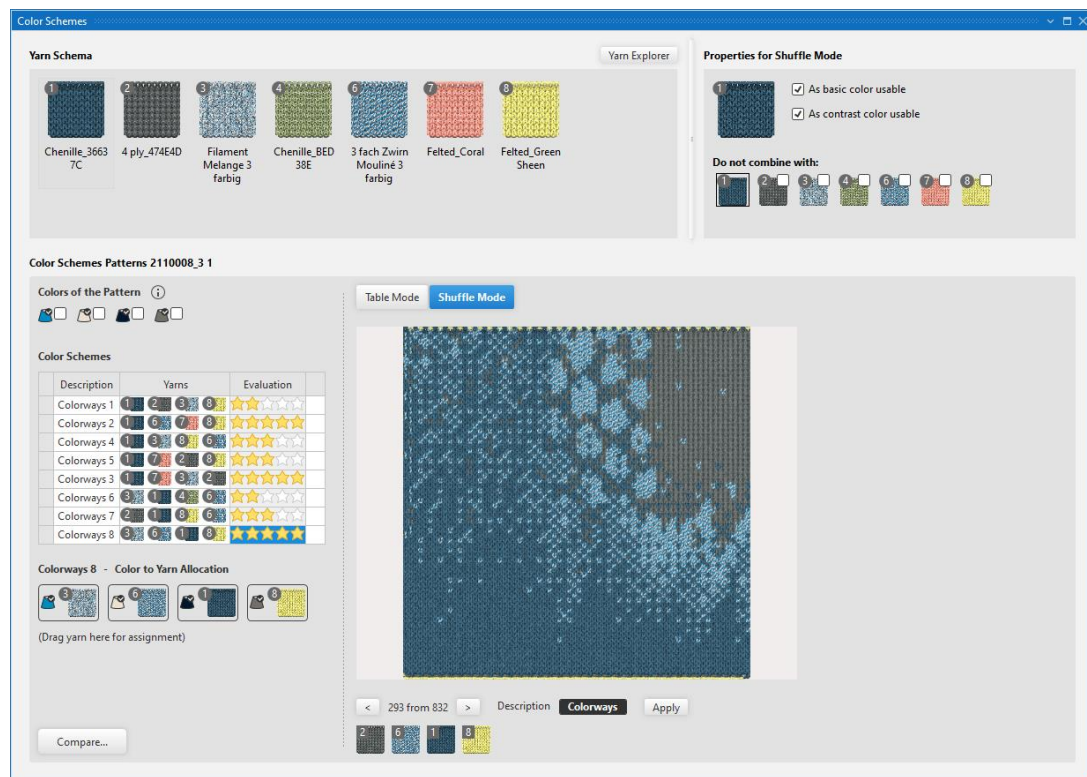
#### INTARSIA

Check the number of yarn feeders



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### 2.7 Colorway Generator

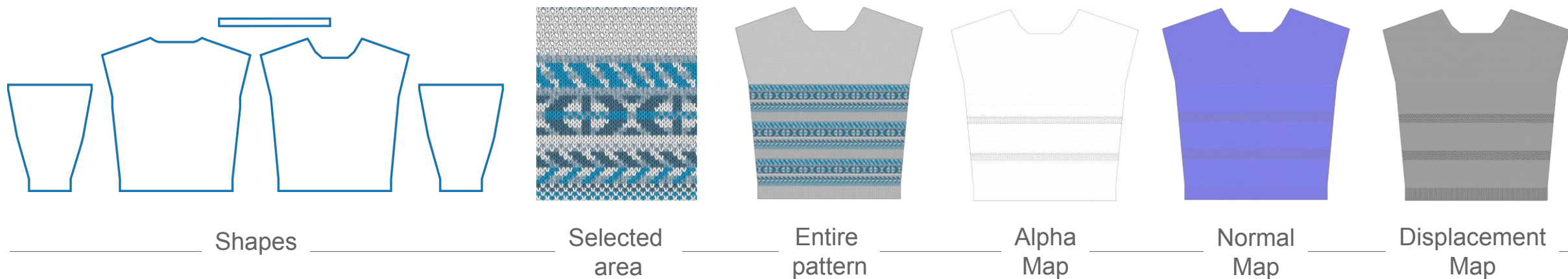


- Integrated colorway generator
- Option to combine different colored yarns
- Instant preview and evaluation of colour combinations
- Facilitates design decision



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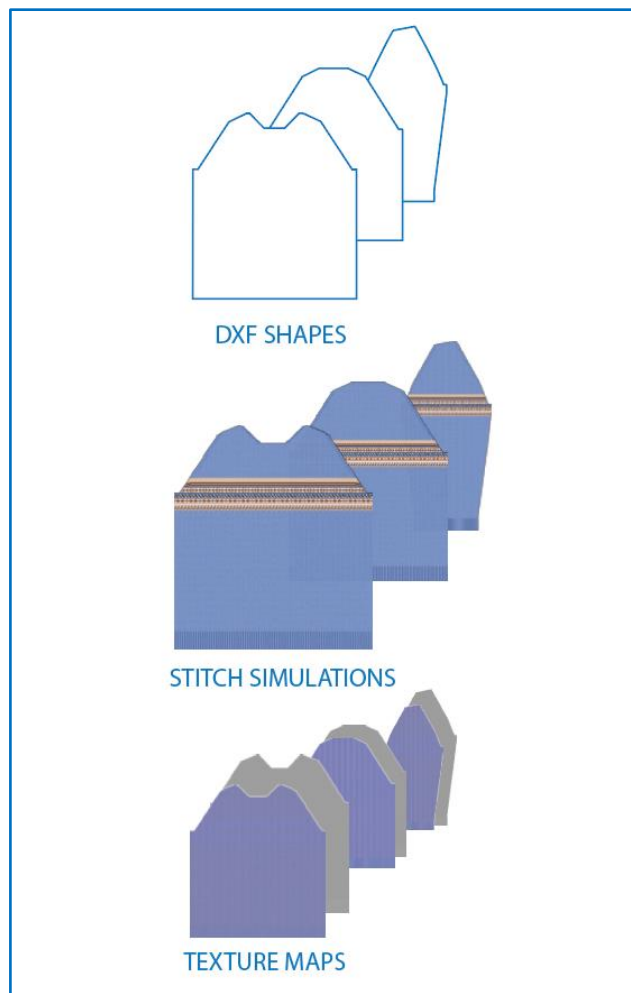
### 2.8 Data Export for simulation in 3D software



- Export of standard industry file formats: shapes as DXF files; stitch simulations as images (JPEG, PNG, U3M)
- Data compatibility with all 3D softwares
- Individual selection of export settings
- Export capabilities of various maps for 3D applications

### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with VStitcher by Browzwear



### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with VStitcher by Browzwear



3D render made with CLO 3D  
By CLO



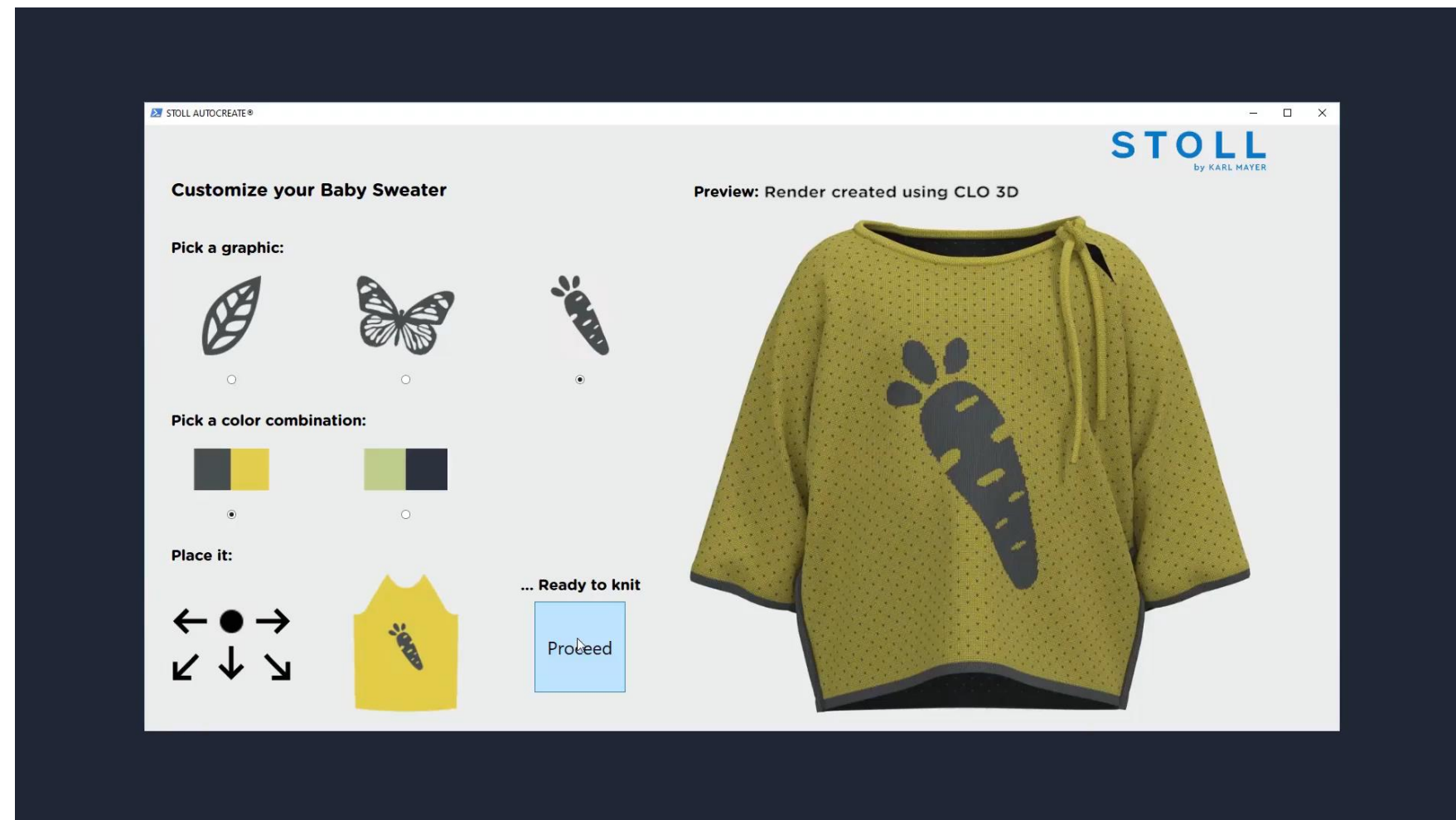
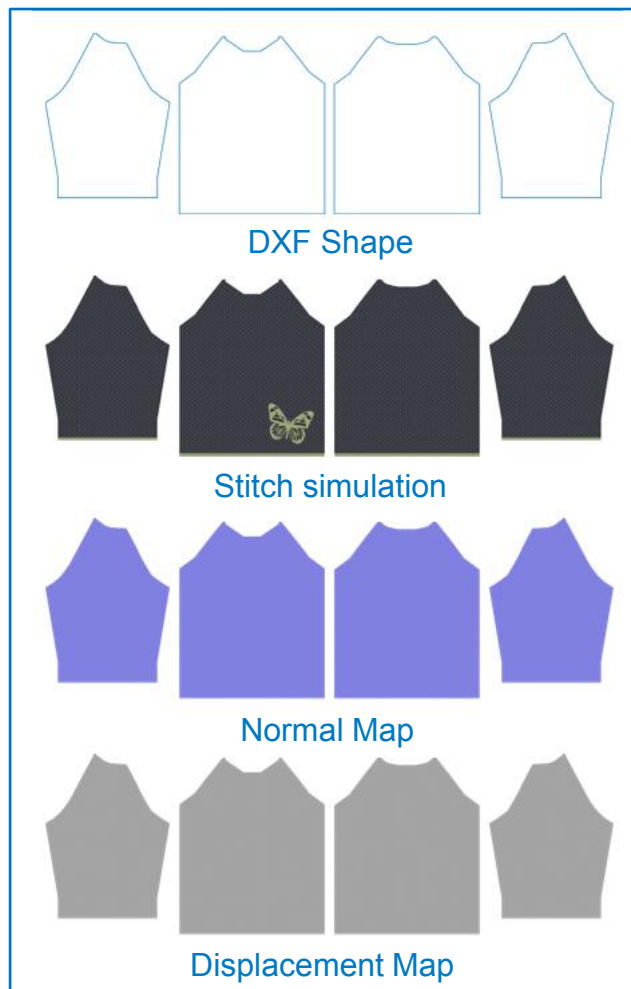
3D render made with VStitcher  
By Browzwear



3D render made with 3D-Vidya  
By Assyst

### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with CLO3D by CLO Virtual Fashion





### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with Vidya by Assyst





### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with VStitcher by Browzwear





### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with VStitcher by Browzwear





### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with CLO3D by CLO Virtual Fashion





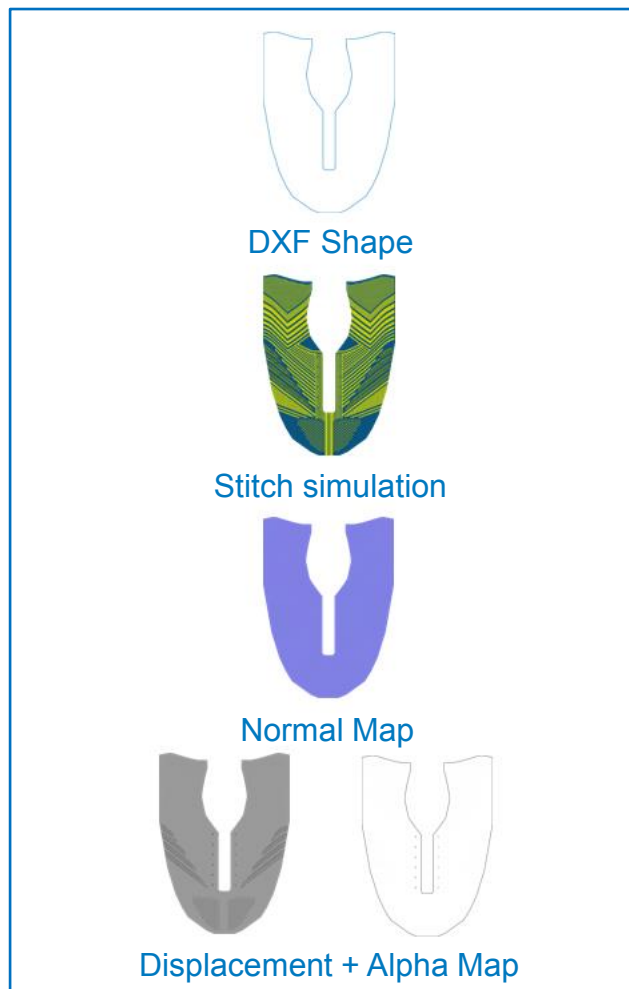
### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with CLO3D by CLO Virtual Fashion



### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with Blender by DESMA





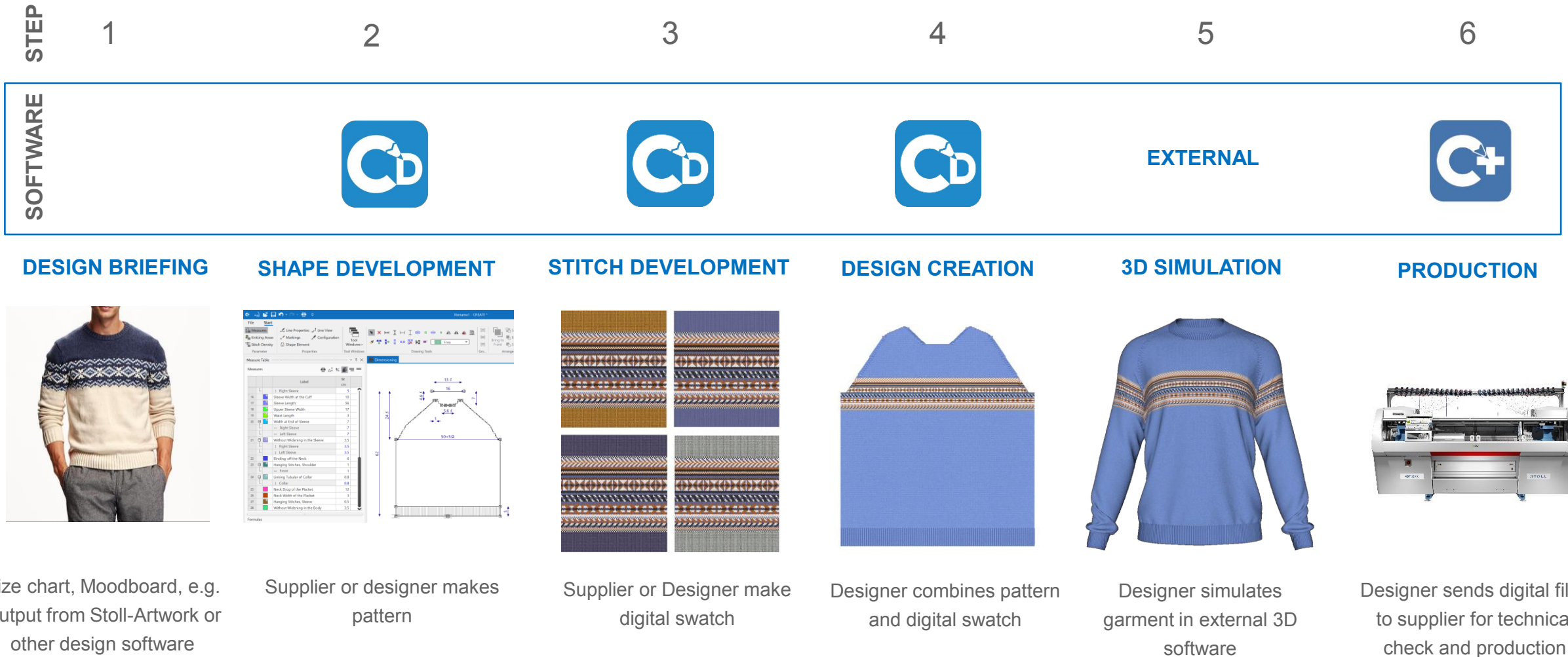
### 3. Use cases

CREATE DESIGN data in external 3D software – 3D render made with Keyshot by Inneo Solutions



## 4 Workflow & Benefits

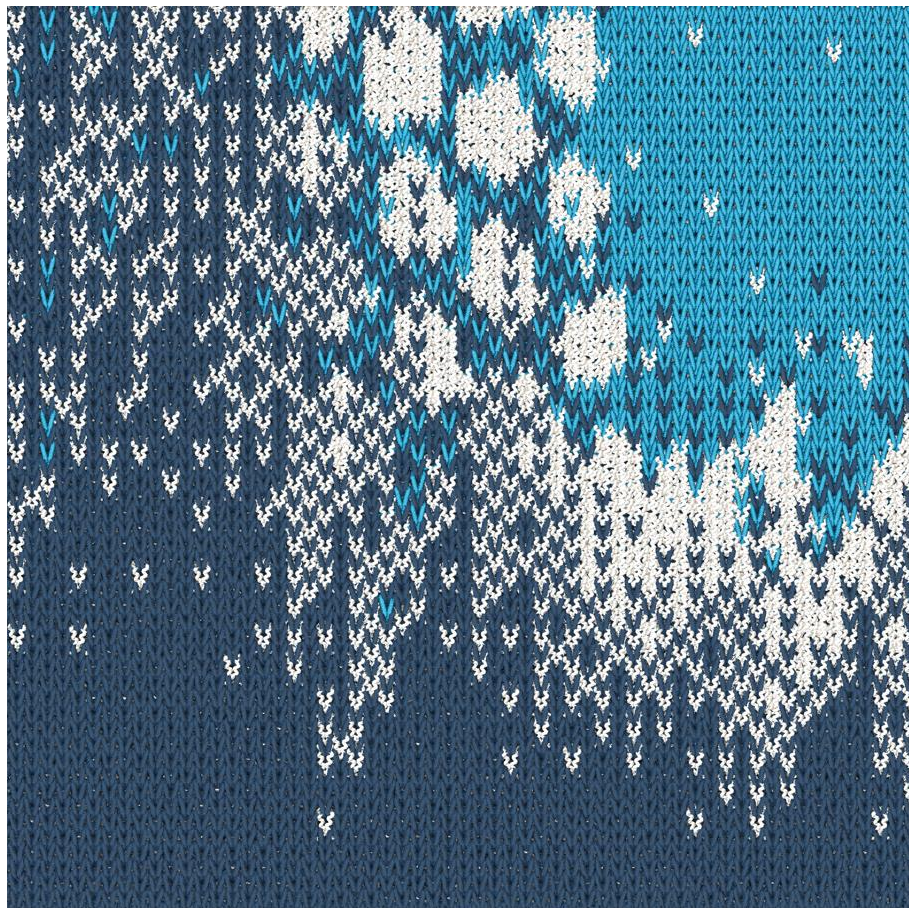
### 4.1 Recommended Workflow





## 4 Workflow & Benefits

### 4.2 Benefits



#### DIGITAL DESIGN PROCESS

- Less physical samples & waste
- Saving on time and resources
- More sustainable

#### UNLIMITED DESIGN POSSIBILITIES

- Faster development
- Design and colour combinations

#### SYSTEM CONNECTION

- Simultaneous creation of knitting program
- Link to production and 3D simulation
- Easier communication with suppliers

#### FLEXIBLE WORKFLOW

- Depending on knit know-how
- Designers have access to knitwear technology

#### COST CONTROL IN DESIGN PROCESS

- Running time
- Material consumption