

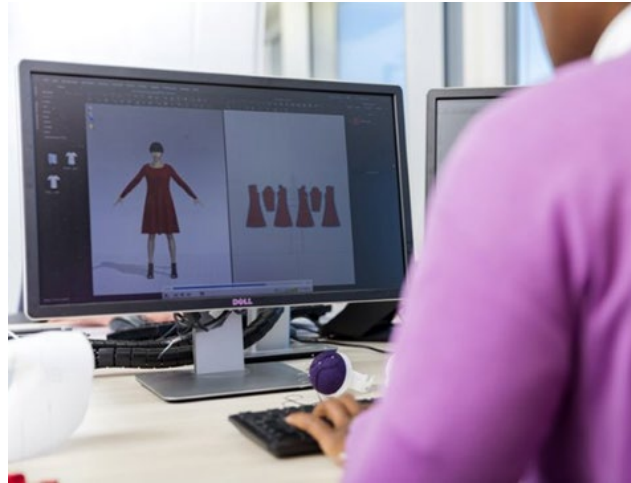
Utilizing 3D & 4D Technologies – A Fitting Solution for Faster Design Processes

Clothing Technology at Hohenstein

Fitting

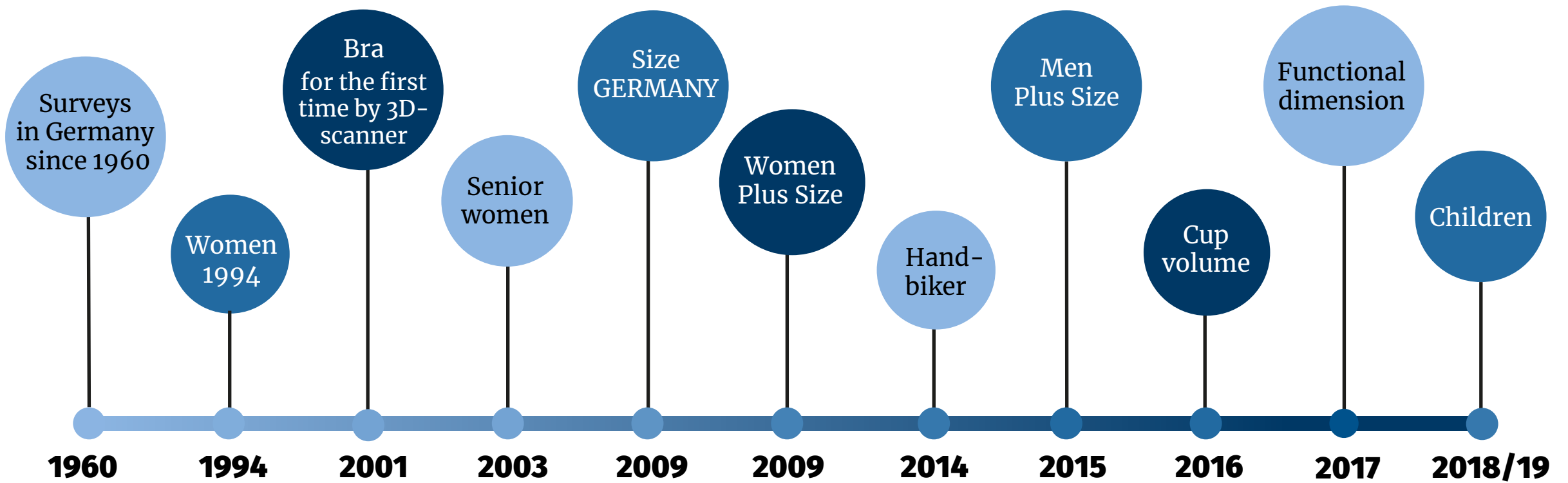


Pattern



Research





Hohenstein Anthropometric Surveys

The Base for Good Patterns & Reliable Fit is Body Data of the Customer

***Fit Testing
&
Precise Patterns
=
The Key to
Fit & Size
Conformity***



Fit Testing

1000 fit models

- Men, women & kids
- All sizes & body shapes
- All age groups:
Babies, kids, teens, young adults, middle age, seniors
- Plus sizes
- Sports, workwear, etc.
- Geographies



Is the supplier's pattern really free?

1 MC* + 1 Sketch + 10 Pattern makers = 10 Different fits

1 MC* + 1 Sketch + 10 Pattern-makers + 1 Block = 1 Fit

1 Fit = Fit conformity in all products

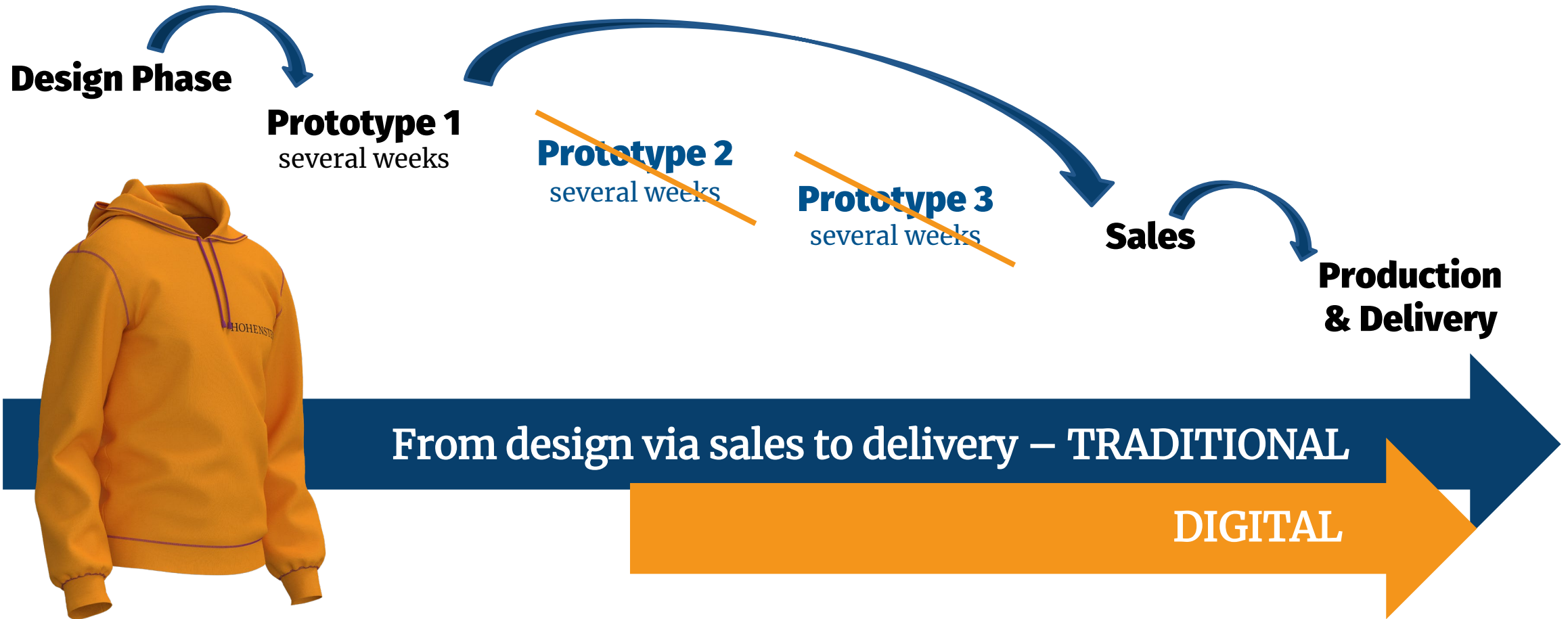
* Measurement Chart

***3D Simulation
Technology Improves
Efficiency***

Why 3D Simulation? Efficiency. Less Prototyping, Shorter Development Time

- Designs can be visualized instantly – without physical prototypes
- Fit models available in all sizes
- Simulation across entire size range
- Better internal communication
- Quick development decisions

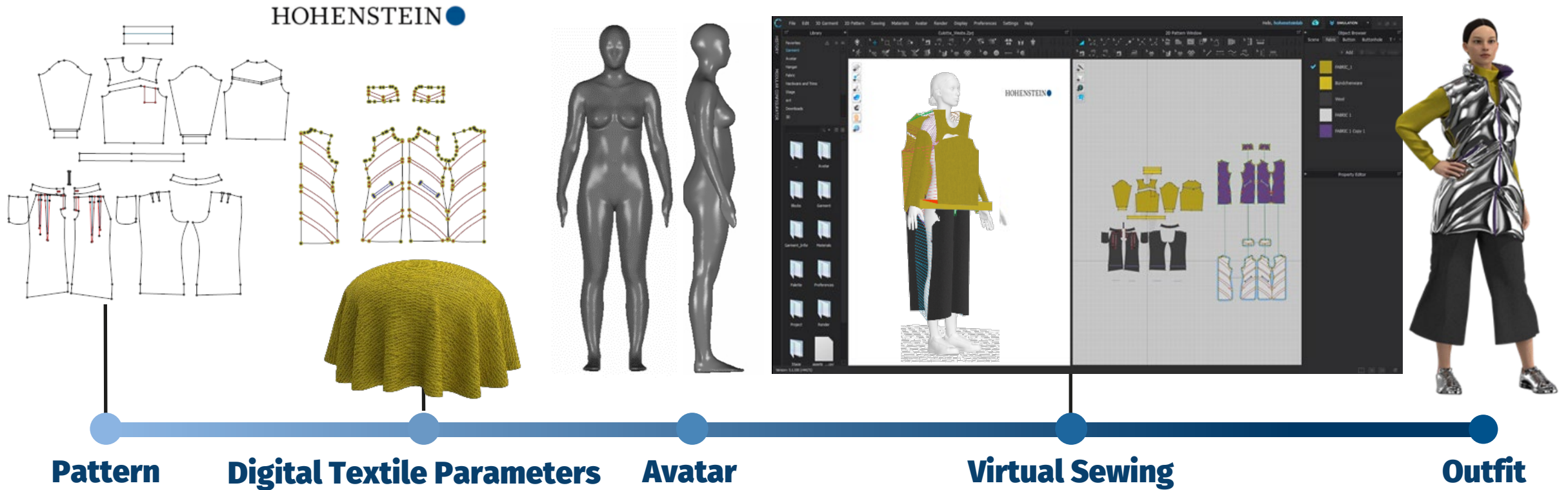




3D Simulation Saves Weeks of Development Time
Less Time, Samples, Materials & Cost - More Efficiency & Sustainability

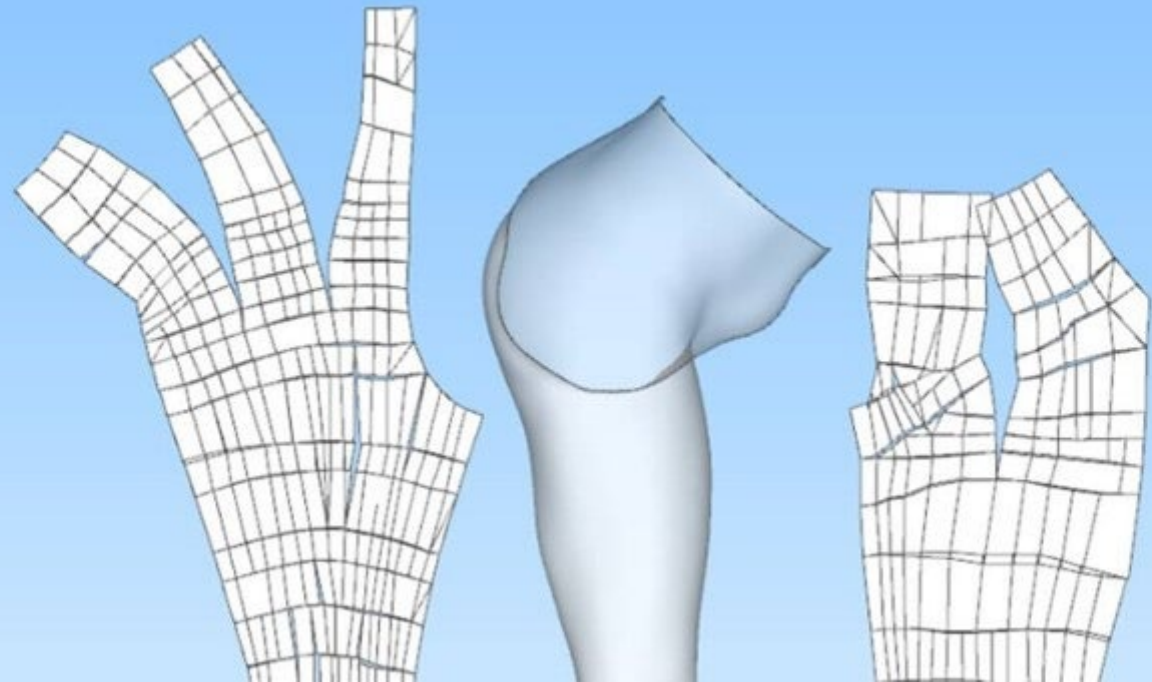
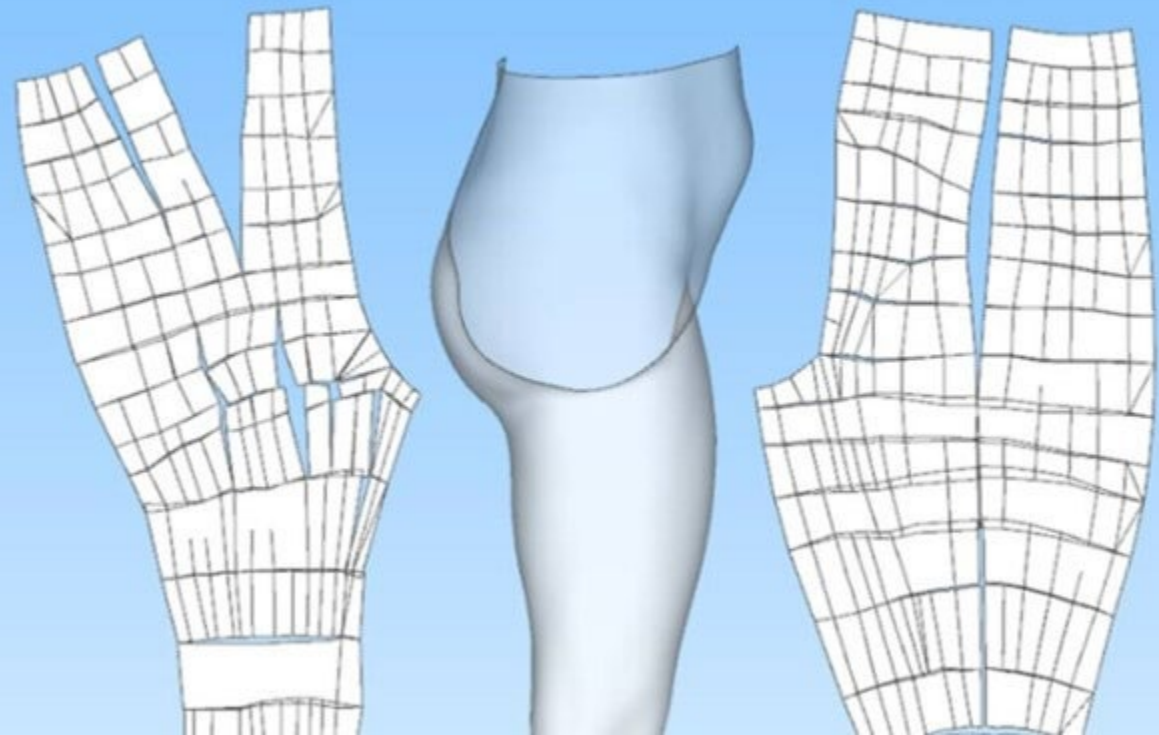
Hohenstein Covers the Whole Workflow

Pattern, Material, Avatars & Fitting



Pattern

- Pattern is a prerequisite for 3D simulation
- Reliable basic patterns are the key



Avatars

- No Avatars, no 3D-Simulation
- Important:
 - Know your own customer group
 - Have information about average body shapes & market shares
- Average avatars, scan avatars, fit forms:
There are various options



Material/Textile Physical Parameters Testing in Hohenstein Labs



Required Textile Material Parameters

3 System Examples - Testing in Hohenstein Labs

Vidya Assyst

- Dehnungsstärke (N/m)
- Dehnung (%)
- Max. Dehnung (%)
- Komprimierung (%)
- Biegefestigkeit (μNm)
- Biegesteifheit (Faktor 0-1)
- Max. Dehnung (%)
- Kompression diagonal (%)
- Elastizität (linear) (N/m)
- Elastizität (quadratisch) (N/m)
- Reibung (Faktor 0-2)
- Gewicht (g/m^2)
- Stoffdicke (mm)
- Spannungsdämpfung (Ns/m)
- Biegedämpfung (Ns/m)
- Faltenvolumen (0,01-1)
- Faltenform (0-100)

Browzwear V-Stitcher

- Mass (g/m^2)
- Friction
- Thickness (mm)
- Blend – W/L (dyn/cm^2)
- Stretch- W/L (N/m)
- Stretch Linearity – W/L (%)
- Shear- W/L (N/m)
- Shear Linearity (%)
- Shrink- W/L (%)

3D CLO Fashion Software

- Friction coefficient
- Thickness, Dicke (mm)
- Bending weft/warp ($((\text{g}\cdot\text{mm}^2)/(\text{s}^2\cdot\text{rad}))$)
- Stretch weft/warp (g/s^2)
- Shear (g/s^2)
- Shrinkage weft/warp (%)
- Buckling Ration weft/warp
- Density (g/m^2)
- Internal Damping

Visualization - Digital Product Communication

Visualization only (without fit)

Starting point & approach

Brands use 3D Simulation to virtually present products online or for TechPacks (i.e. digital product communication)



3D Fitting

3D Fitting

Starting point & approach

- Optimizing product development processes by reducing prototypes, material & time
- Only possible with deep fit & pattern knowledge



Sugarcoated vs. Reality



How to utilize 3D successfully

- Know how to use 3D technology
- Know how to interpret the simulation results
- Basic fit & pattern knowledge
- Know target group & their measurements
- Material parameters available
- In-house workflow implemented





Workshops, Training & Support Combined Expertise in Pattern, Fit & 3D

What's Next?

Dynamic fit





Linking 3D Simulation of Movement with 4D Scanning

Thank you

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Learn More: [Hohenstein.US/Fit](https://www.hohenstein.us/fit)