

Make What Matters™

“RX-AM™ Platform
to print industrial grade elastomeric parts”

19. Coachulding Forum – 06. März 2024

Ralf Dahmen



Chromatic 3D Materials

Making the strongest materials printable

Chromatic 3D Materials is a 3D printing technology company using chemical reactions to make manufacturing more flexible, cost-effective, and sustainable.

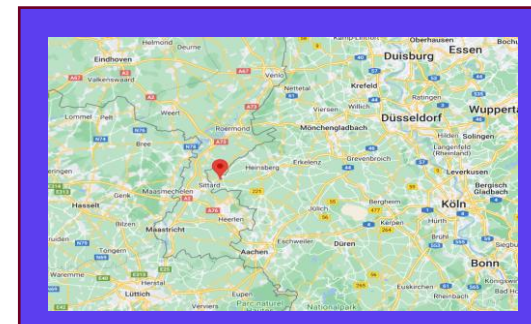
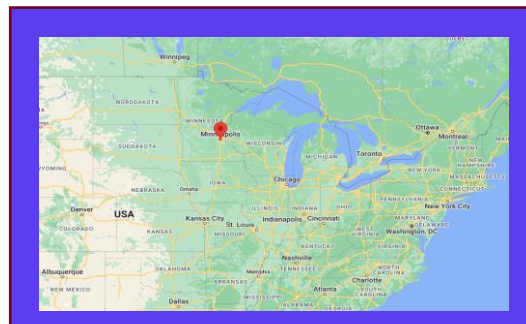
What makes us different

We take a materials-first approach to printing. Commercial applications demand certain materials like thermoset elastomers.

Our Locations

US Headquarters

Chromatic 3D Materials
684 Mendelssohn Ave N
Golden Valley, MN 55427



German Facility

Chromatic 3D Materials GmbH
Kirchstr. 18
52538 Selfkant

Chromatics' Offering

Parts



- Support R&D for new concepts
- Provide test specimen and lab-results
- Production of standard & customized parts
- SOP of small series size

3D-Printer



- Low cost printers for
 - R & D
 - Low volume production
- We support part & process dvlpt.
- for all available resins (C3DM)
- Multi-material printing

Resins



- Industrial grade materials
- Thermosets elastomers for a variety of different applications
- Access to newest developments (EPDM...)

Our team has deep experience in manufacturing, materials science, and scaling new innovations globally.

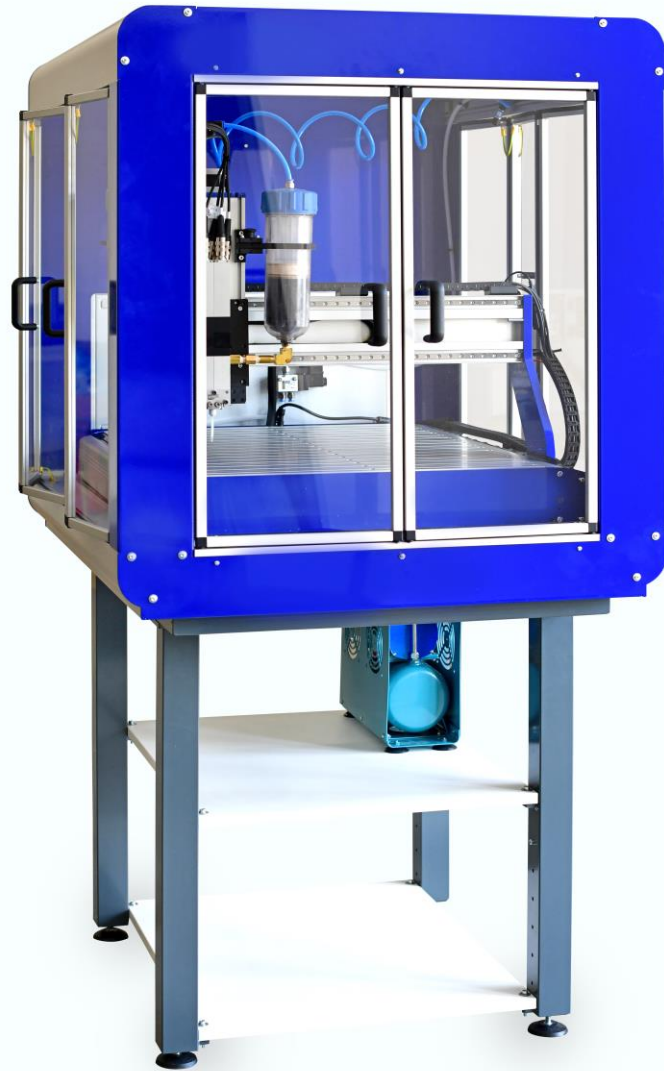
Principle

Next-gen printing with chemical reactions

We make industrial-grade materials printable

- Printing Liquid in Liquid
- Very smooth surfaces in all three directions
- No support structures
- No post-processing
- Isotropy
- Multi material print
- Durable for end-use applications





Hardware, Software, Materials

- ✓ Low-cost versatile printer
- ✓ Hybrid multi-component printing
- ✓ Supported by ChromaWare Software for build-preparation and process control
- ✓ Prints thermosets: adaptable, industrial-strength materials



Hardware, Software, Materials

- Robust & Fast
- Made in Germany
- RX-Flow™ 3500: 479mm x 743mm x 194mm
- RX-Flow™ 7000: 680mm x 1040mm x 194mm

- ✓ Low-cost versatile printer
- ✓ Hybrid multi-component printing
- ✓ Supported by ChromaWare Software for build-preparation and process control
- ✓ Prints thermosets: adaptable, industrial-strength materials

Materials

Thermosets for durable 3D printing

You touch
thermosets everyday

Seals and gaskets
Medical devices
Vehicles
Footwear
Apparel



WHAT ARE THERMOSETS?

Polymers are either thermoplastic or thermosets.

Thermoplastics melt to form.

Thermosets react to form.

Thermosets are critical for durable goods.

Thermosets are industrially trusted.

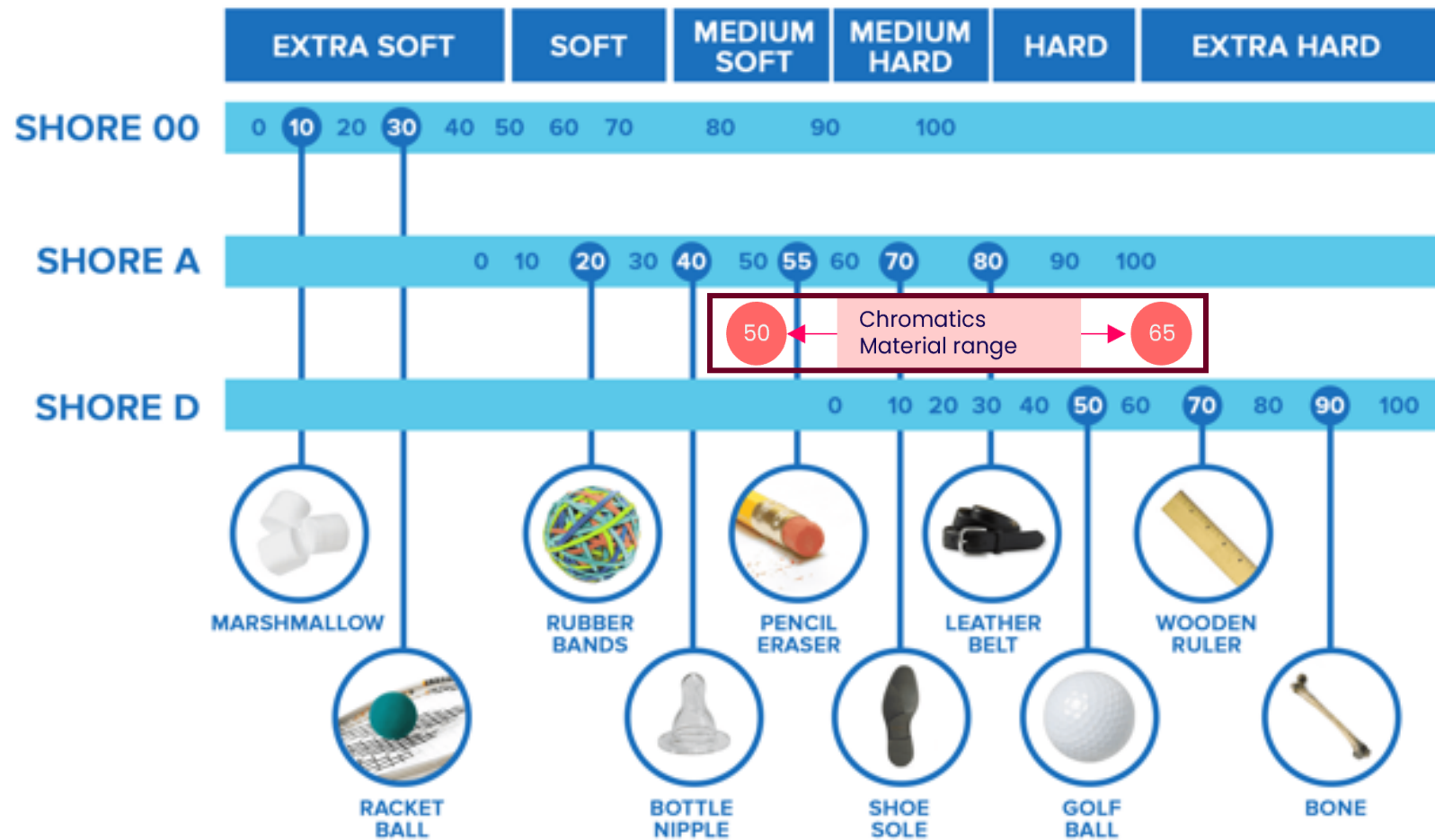
Versatile Print Resins



STANDARD RESINS & TAILORED RESINS

- **ChromaFlow** –
Basic printing resin
High adhesion to fabric
Washable
- **ChromaLast** – Low
Compression set
- **ChromaMotive** –
HNBR like tensile
properties
Medium
compression set
- **ChromaResist** –
Resistant to alkaline
environments like Li-
soap greases.
- **Tailored Resins** –
Material Properties
Color
Additives
- **In Pipeline** –
EPDM
SBR
Others....

Shore Hardness Scale



ChromaFlow 70

- Harder resin, Shoe Sole like
- Uses
 - Shoe Sole
 - Dampeners
 - Bellows
 - Covers
 - Grommets
 - bladders



Property	
Shore A hardness	70
Elongation at break	358%
Modulus @ 100% strain	2.99 MPa
Peak stress	9.06 MPa
Compression set (room temp 24 hour)	Above 75%

ChromaLast 65

- Seals and Gaskets that are in a compressed environment
- Uses
 - Seals
 - Gaskets
 - Membranes

Property	fresh	aged
Shore A hardness	60	64
Elongation at break	618%	664%
Modulus @ 100% strain	318	278
Peak stress	18.4 MPa	17.9 MPa
Compression set 24hr 22°C	15 %	
Compression set 24hr 100°C	35 %	

Target markets

Our initial market: elastomers

INDUSTRIAL PARTS



Parts and equipment like seals and gaskets, tooling, and material handling

APPAREL & TEXTILES



Functional and aesthetic features for sportswear, footwear, apparel, and technical textiles

TRANSPORTATION



Applications in sunroofs, fabric interiors, and integrated electronics

MEDICAL



Parts for everything from tiny personalized devices to large diagnostic equipment

AEROSPACE & DEFENSE



Applications in drones and rockets

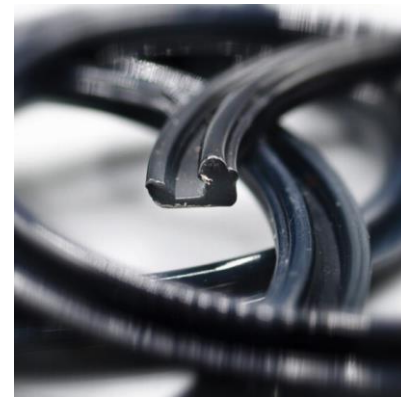
Example Parts:



MULTI-MATERIAL
BELLOWS



BLADDERS



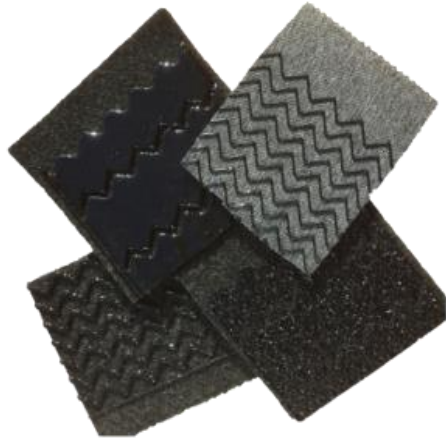
SEALS & GASKETS



NEAR NET SHAPES

Print on textiles, metal, and plastics

Eliminates complex manufacturing steps



ELIMINATE SEAMS



ELIMINATE ADHESIVE



BUILD ON METAL



INCORPORATE SENSORS

A solution to keep Daimler moving

A 50-year-old grommet threatened to shut down Daimler Truck production (the sole supplier went out of business).

- In 2 days, we 3D printed a grommet that met Daimler's material performance standards.
- Thanks to the part, they avoided shutdown.
- Chromatic won the bid for 5,000 parts delivered for the remainder of 2022.

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DOWNTIME
FOR DAIMLER

3

MONTHS
OF SUPPLY

5000

PARTS
JUST IN TIME

After this initial project, Daimler and their supplier ordered four more part types from Chromatic.



GROMMETS

A view of the Daimler's grommets as they were being printed.



A solution for unique parts

Chromatic 3D Materials printed polyurethane track pads directly onto aluminum plates for a vintage John Deere tractor. The tractor pads offer exceptional strength and durability, outperforming all other considered materials.

MADE WITH
CHROMASCAN!

Our software let's
manufacturers print directly
on 3D surfaces like metal.



[SEE VIDEO](#)



Print In Place O-Rings

Print In Place O-Rings



A solution for consumer devices



Chromatic offered more flexibility than other technologies, such as injection molding, which are more expensive and lock us into one product design due to sunk costs on molds.”

Aquilo-Tech

MAKER OF THE FIRST COOLING FITNESS BAND

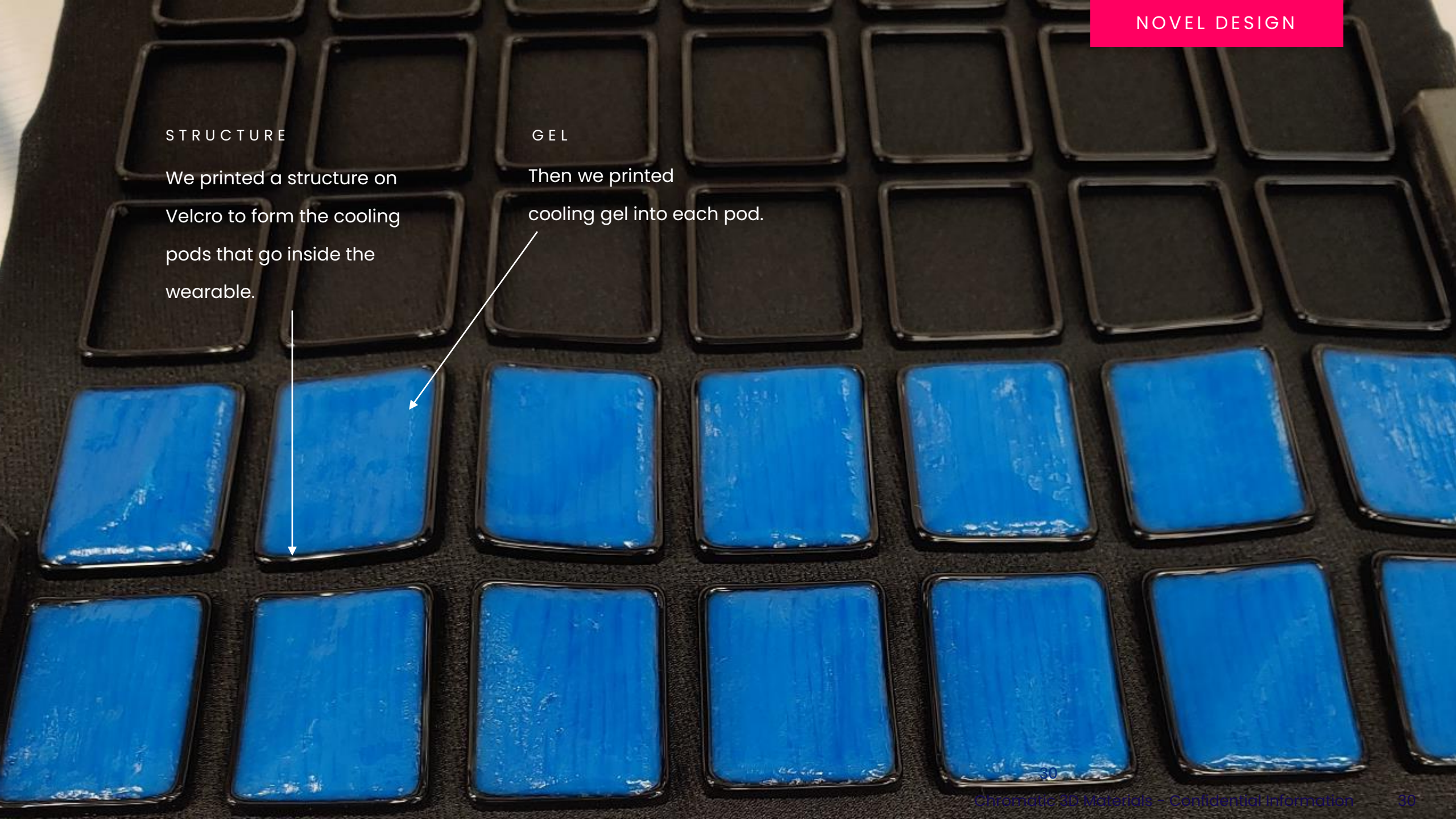


STRUCTURE

We printed a structure on Velcro to form the cooling pods that go inside the wearable.

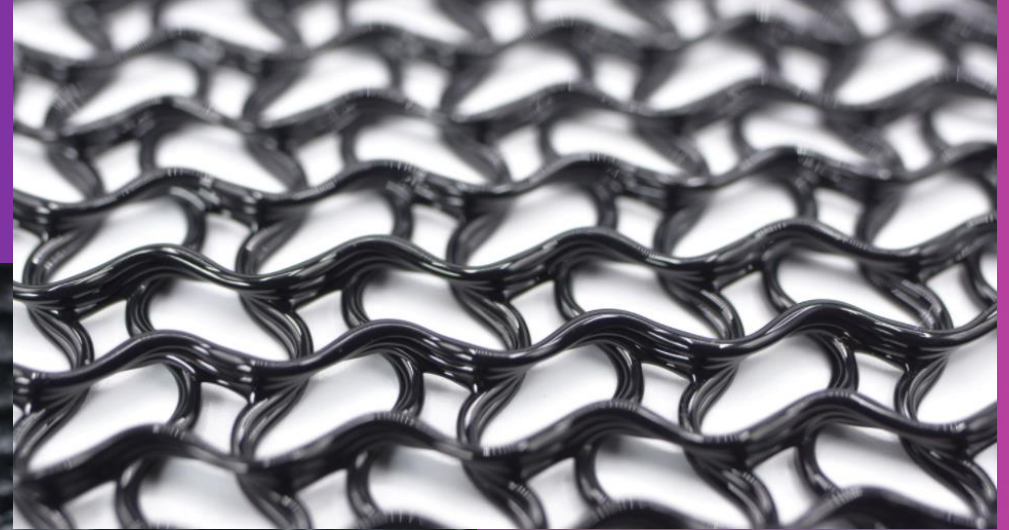
GEL

Then we printed cooling gel into each pod.



3D Structures on textiles

- Individual buffer pads



Thank you

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