



RESET
Interreg Europe



European Union
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Development Fund

NEW SUSTAINABLE CHEMISTRY

Bicomponent spunbond nonwovens

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THE « MAGIC BOX »

Key Words

Polymers : **Advantage**

Technology : Simple

Product : Unique



POLYMERS

PLA:

- Enviromentally Friendly
- Sustainable.....
- Biopolymer
- Etc.....

POLYMER FUNCTIONALITY

Materials List:

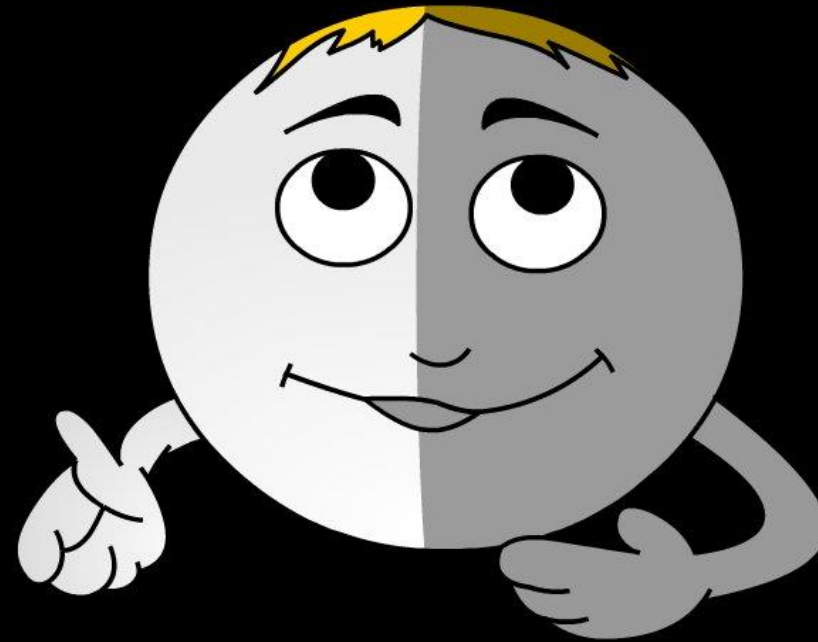
Ingeo Grade	RV	%D
6202D	3.0-3.2	1.5-2.5
6752D	3.2-3.4	3.7-4.6
6302D	2.9-3.1	9.5-10.2
6100HP	3.0-3.2	0-0.5
6252D	2.4-2.6	1.2-1.6
6362D	2.3-2.7	10.5-13.5

WELCOME TO THE “BICO-WORLD”

PLA

PET

PE



PP

PA6

PBT

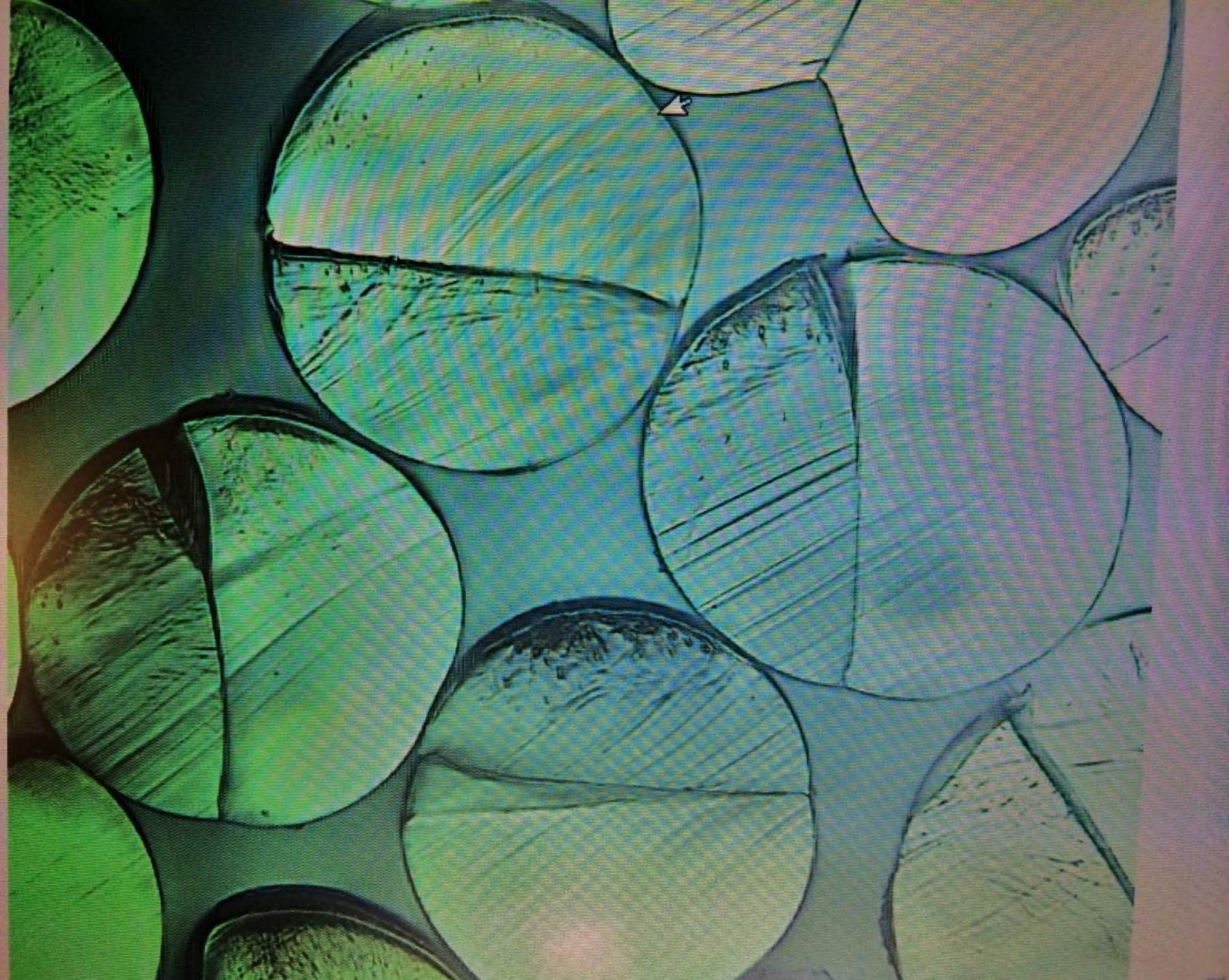
BICOMPONENT FIBERS

In the Bicomponent world,
we look at the **polymers**
in a different way.

We look at what one
polymer brings to the table
when **combine with**
another polymer to
make a fiber.

We look **for something**
different, unique; an
advantage over the rest
either in cost, processability
or functionality.

ROUND SIDE BY SIDE





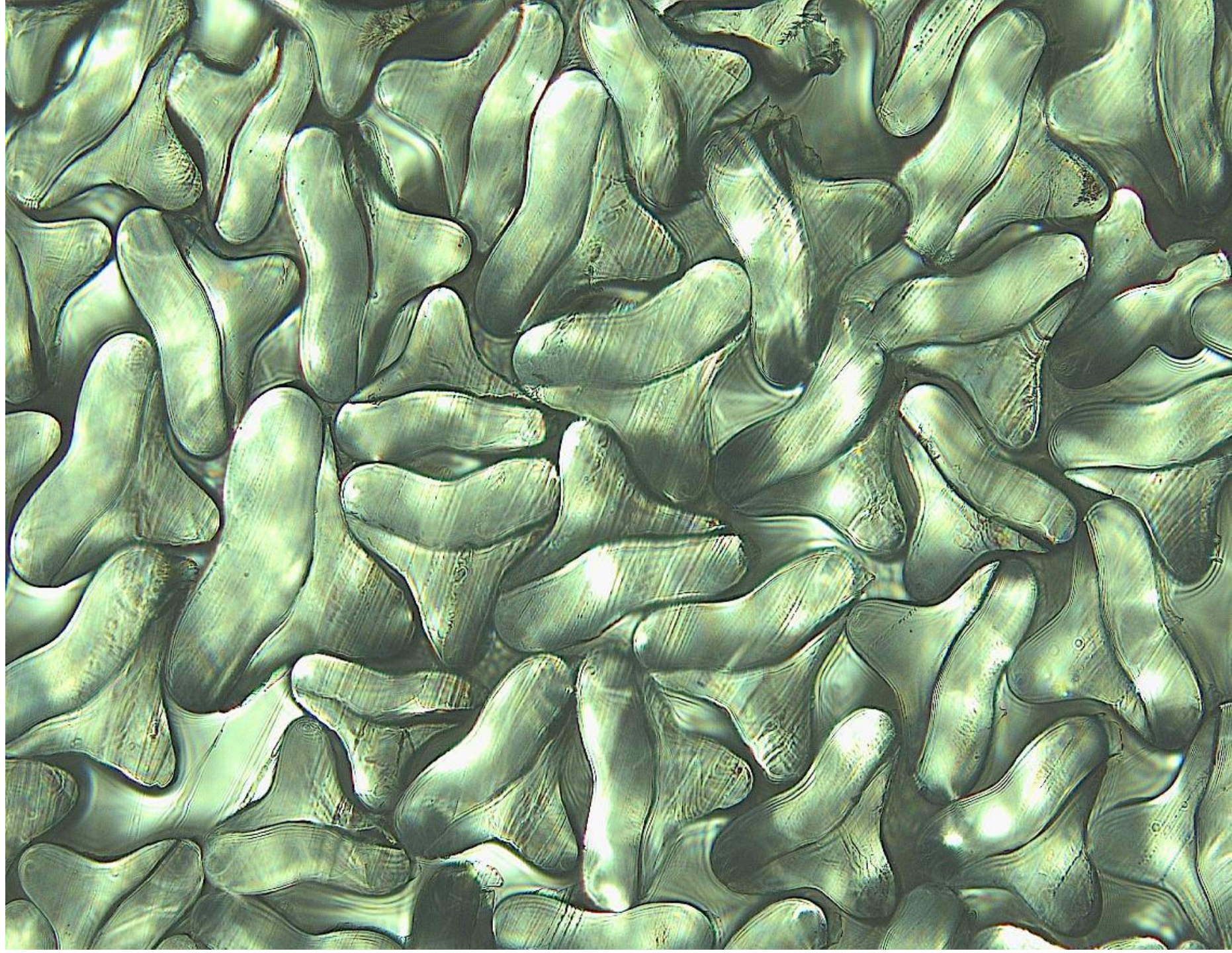
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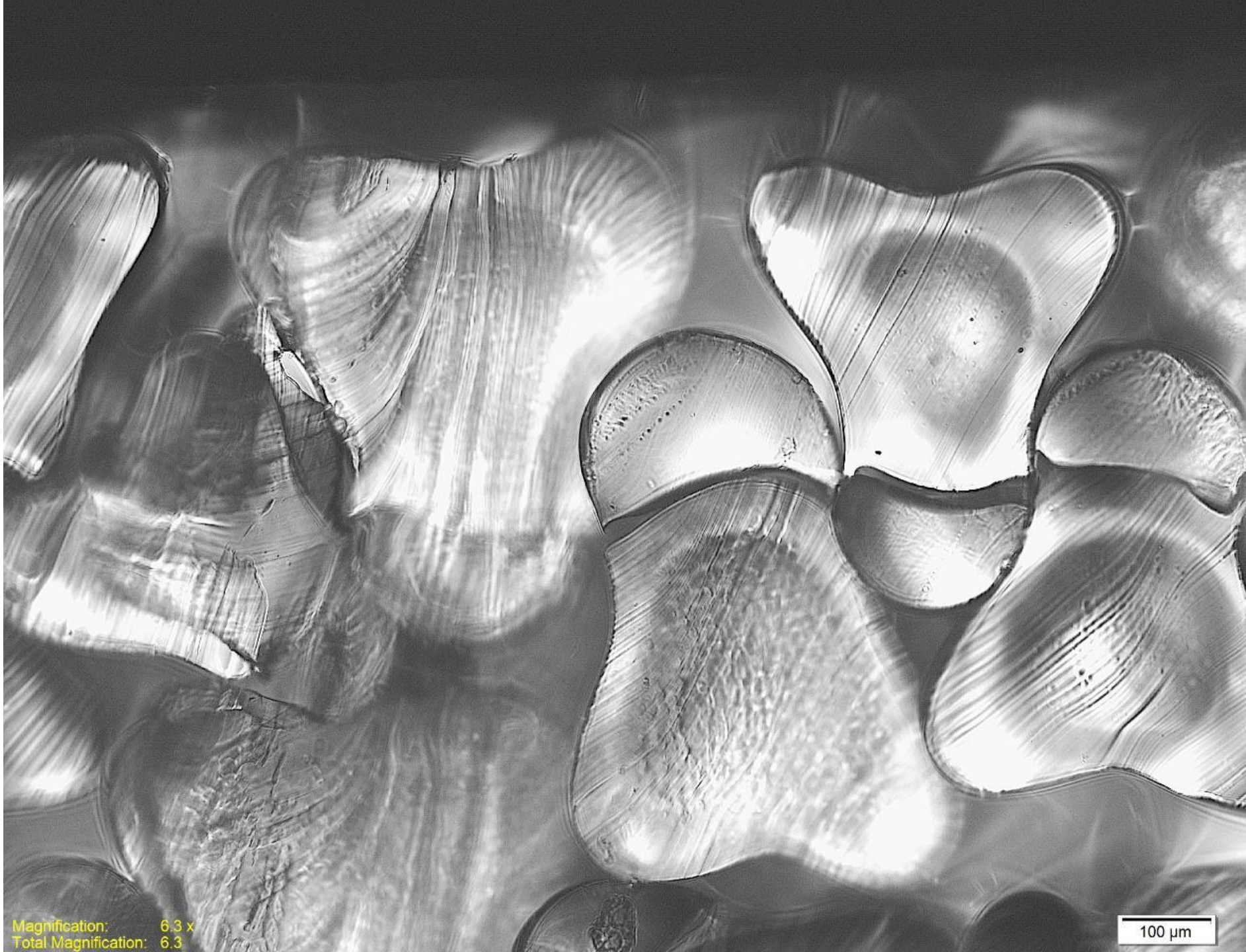
TRILOBAL SIDE BY SIDE



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TIP TRILOBAL



HOLLOW





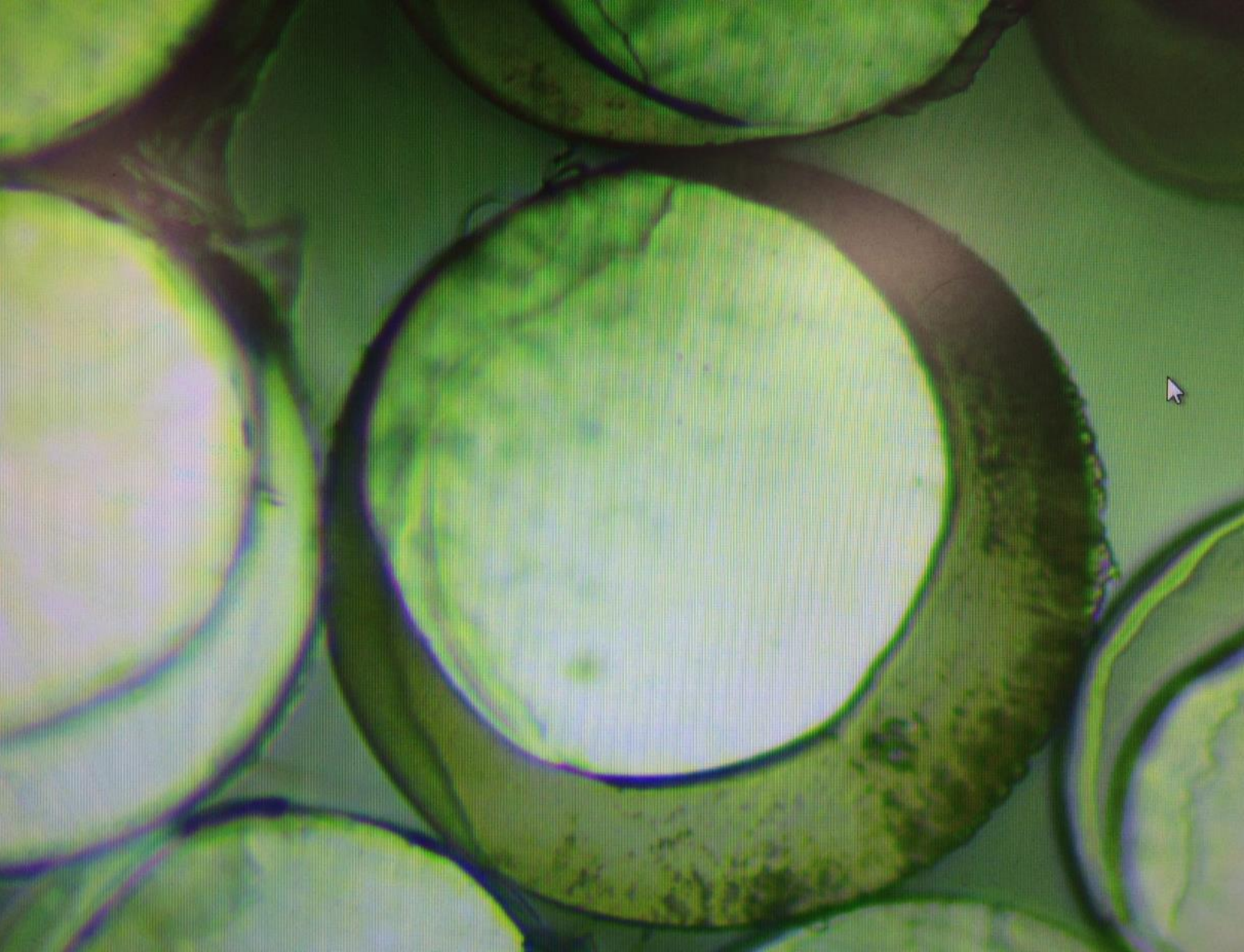
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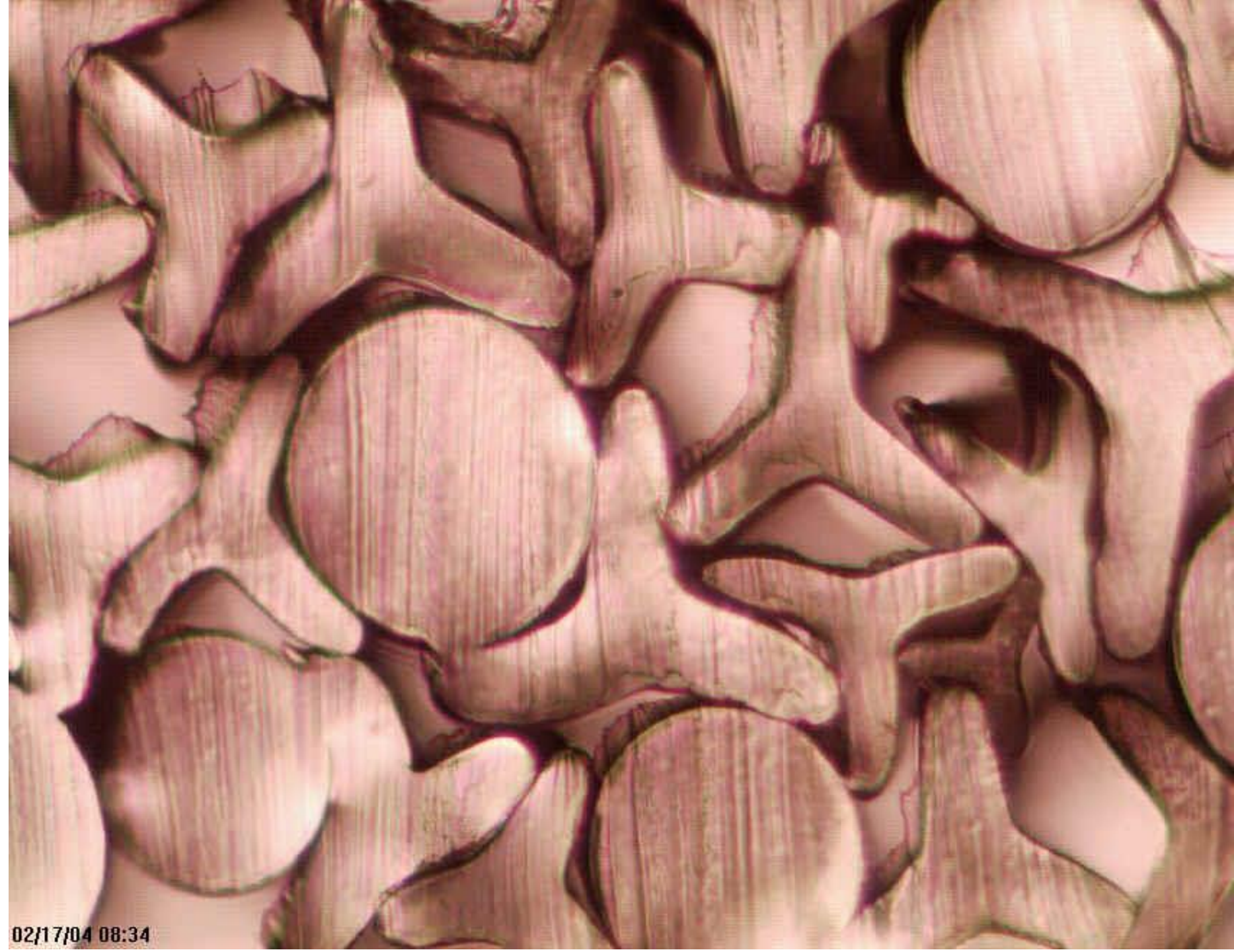
ECCENTRIC CORE



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MIX SHAPES



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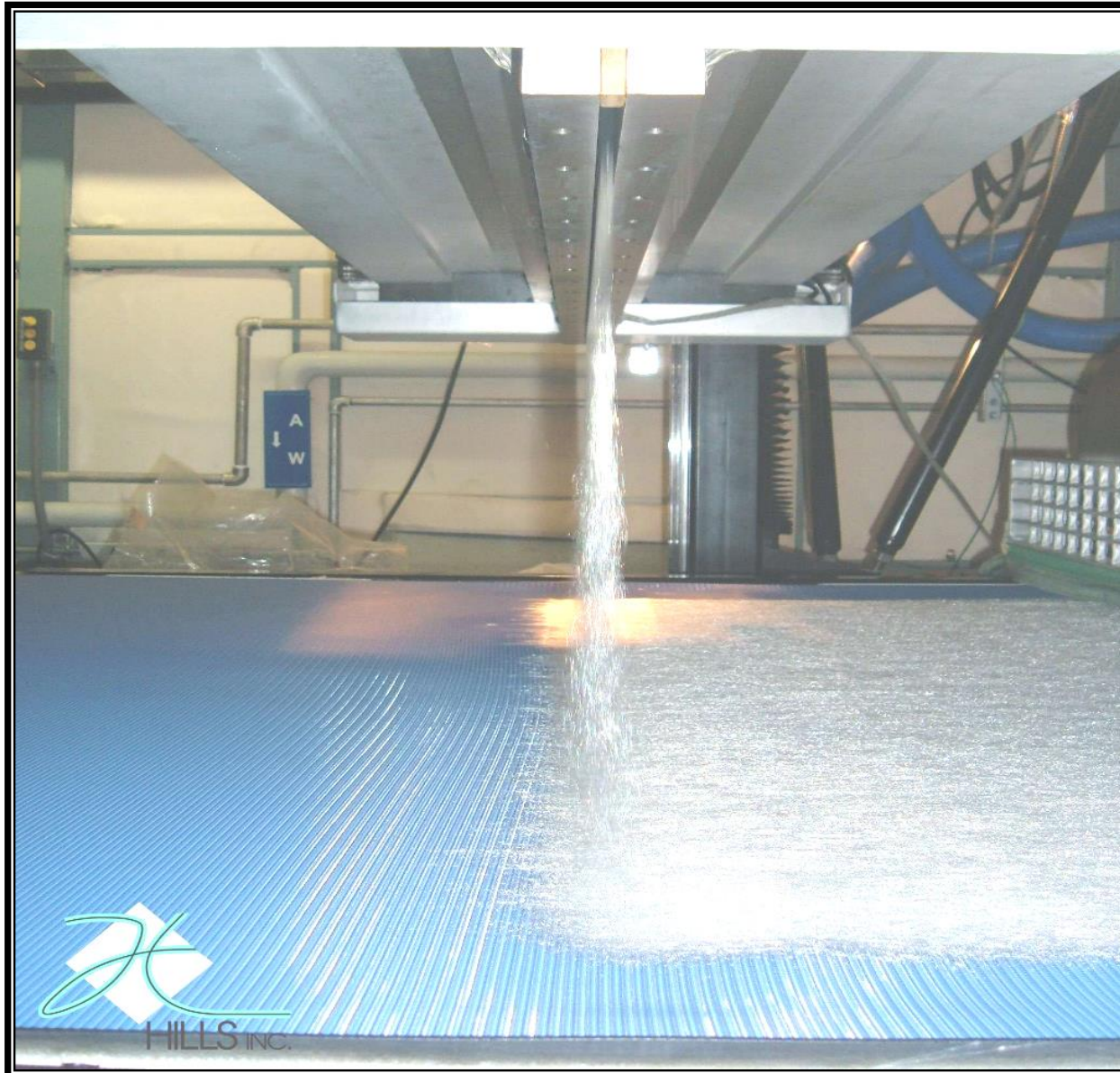
NonWoven Fabrics: Fabrics which are neither woven nor Knitted]

- Carding (staple fibers)
- Air Lay (staple fibers)
- **Spun Laid /Spunbond (filaments)**
- Melt blow (filaments)
- Others ...

SPUNLAID (SPUNBOND) PROCESS

- Fibers are spun and then directly dispersed into a web. This technique leads to faster belt speeds, and cheaper costs.
- Simple process: Directly from the polymer(s) into a fabric.
- Spunlaid (as well as carded) nonwovens would have no mechanical strength by themselves, without the bonding (mechanical, chemical or thermal) step.

TRADITIONAL SB => FLAT MATERIAL



Usage in Diaper,
Hygiene and
Medical
applications

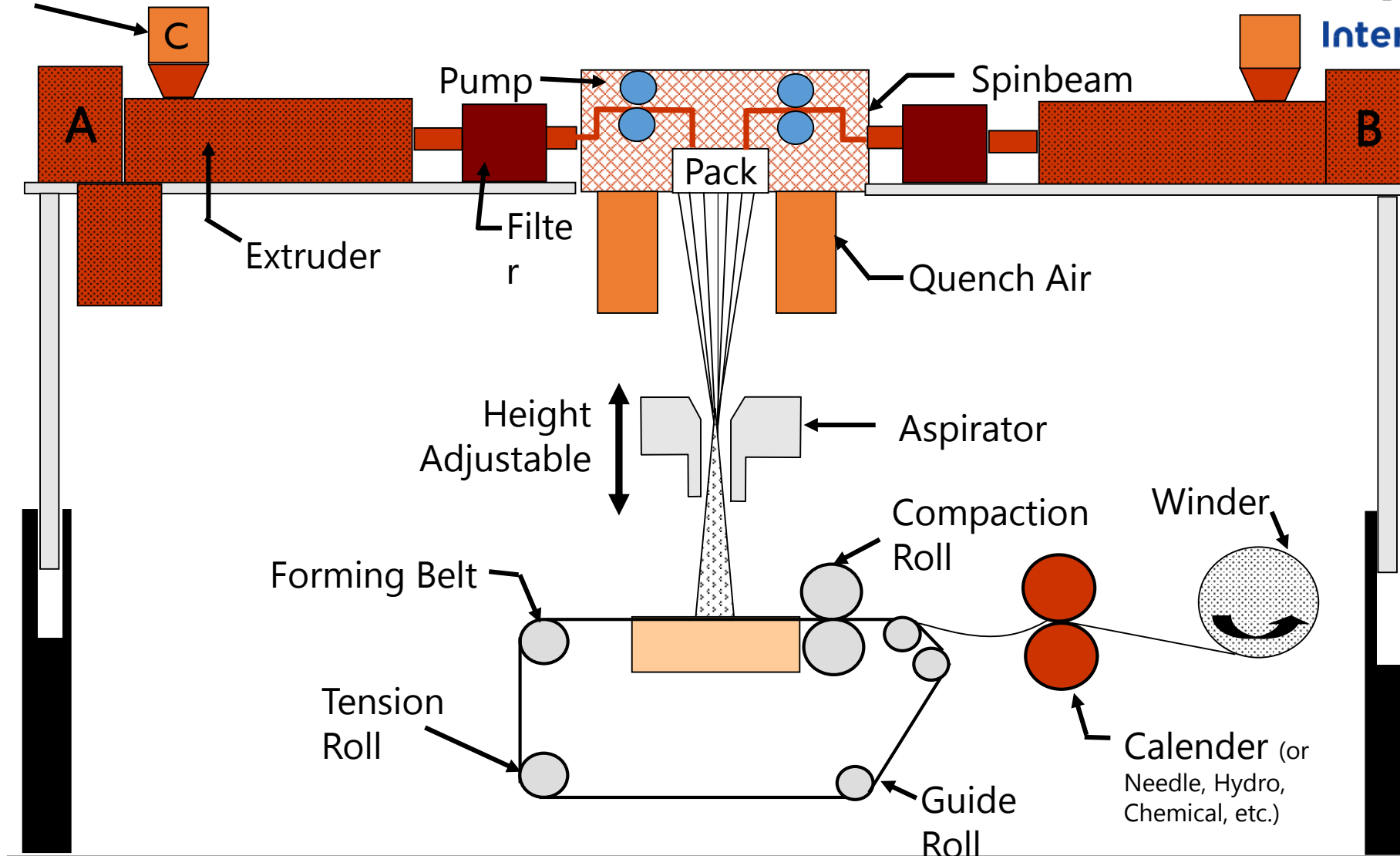
BICOMPONENT SPUNBOND PROCESS



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Polymer Hopper



MICRO-DENIER (SEGMENT PIE)

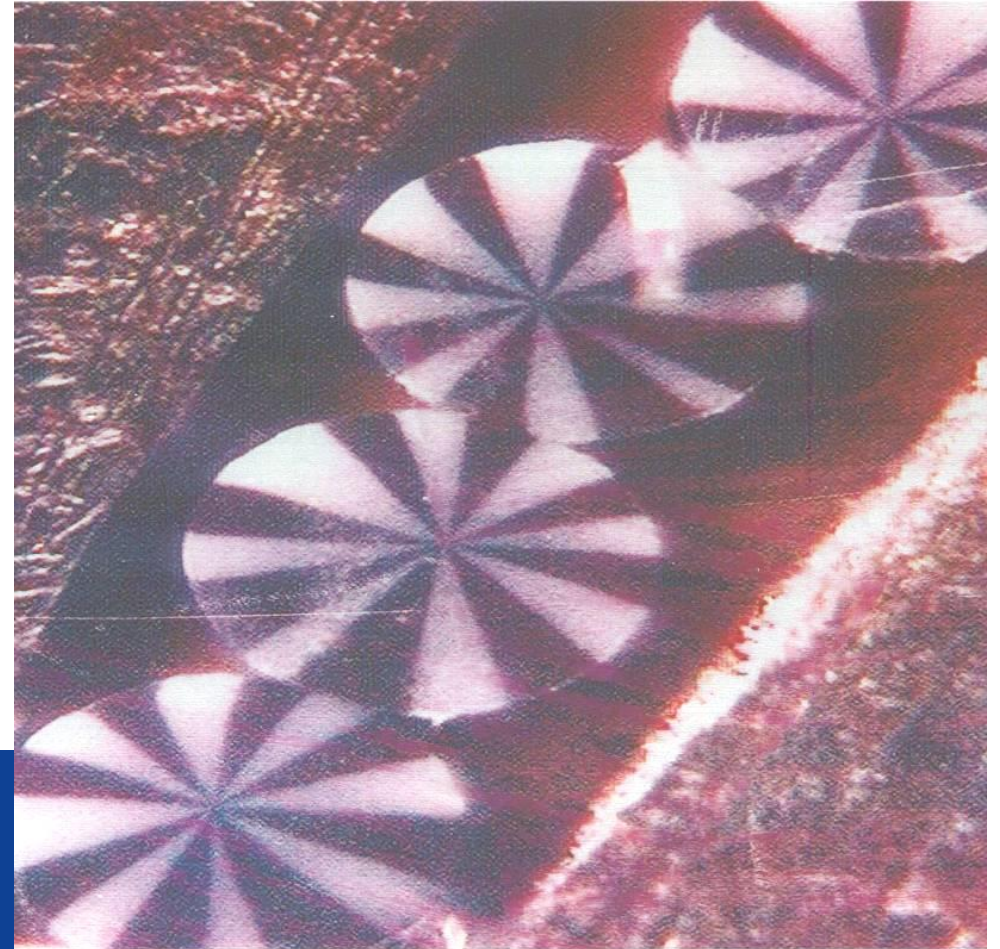
Uses:

Wipes

Absorbants

Filtration and Other high-
surface area apps

Polymers: Mostly PET/PA6



MICRO-DENIER (ISLANDS)

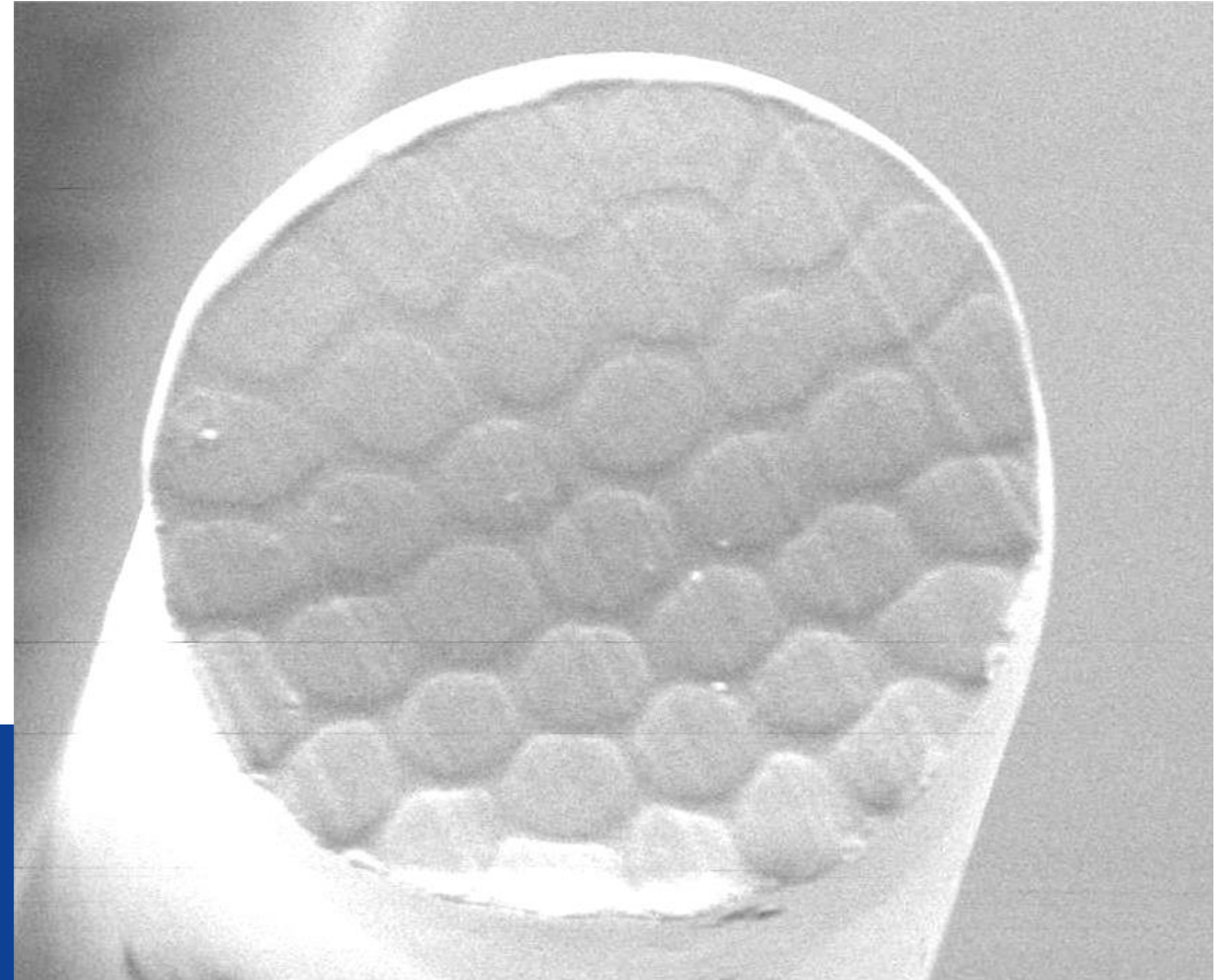
Uses:

Filtration

Synthetic leather

High-tenacity filament

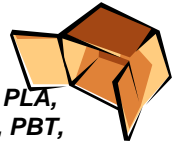
*Polymers: PA6 or PET islands,
PLA, EVOH, ESPET sea*



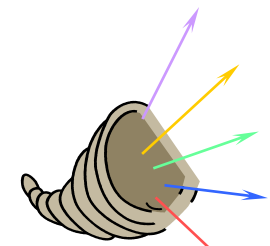
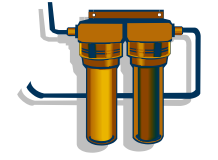
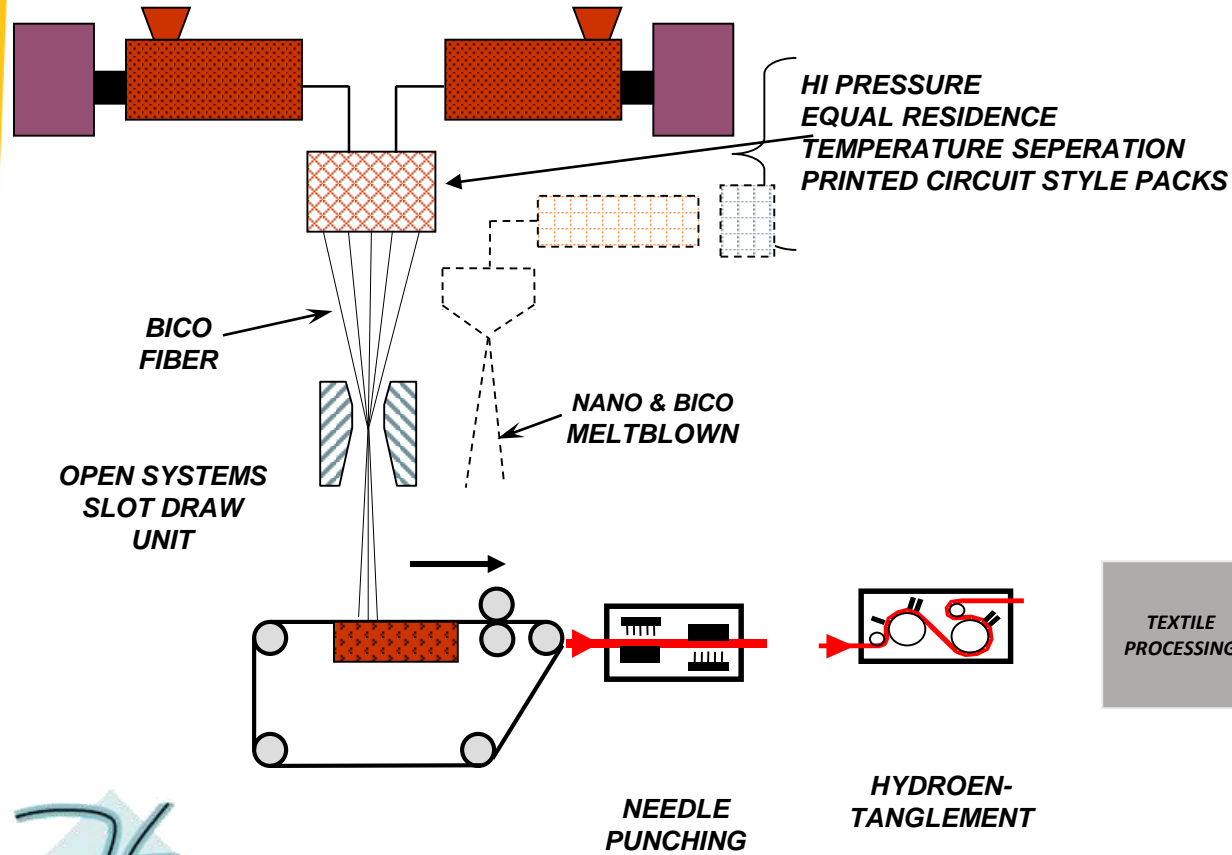
NONWOVEN OPPORTUNITIES



EASTONE, PLA, EVOH, ect.



PA, PET, PLA, PTT, PPS, PBT, PVDF, ect.



PRODUCT

WHAT'S NEW ???



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THE FUTURE OF NONWOVENS

When talking of tridimensional Nonwovens, Carding process has been the dominant technology....But what if a lofty material can be made in very simple process just by selecting the right polymer combination in the right fiber configuration to make a web...

LOFTY SPUNBOND/SPUNLAID MATERIAL

**SPUNLAID MATERIAL IS
NOT A 2D STRUCTURE
ANYMORE**



ONE SIMPLE PROCESS



HIGH LOFT > 80MM



**CONTINUOUS
PRODUCTION**



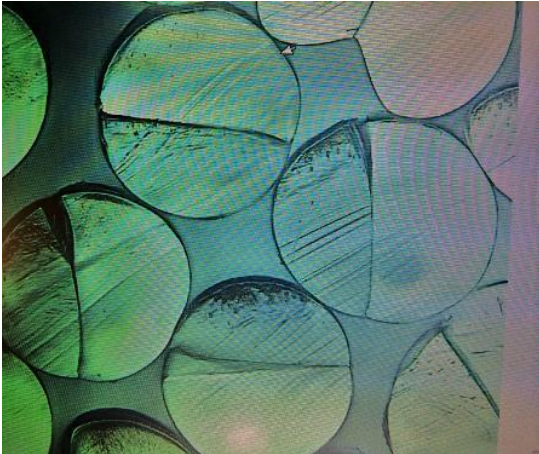
WHAT IS BEHIND THIS

- Develop spiral fibers during the Spunlaid process to create loftiness in the material.
- Change polymer ratio and /or fiber structure to optimize the characteristics in the material.
- Interlocking of the fibers under fiber activation to improve strength in the material.

SPIRAL FIBER



FIBER STRUCTURE AND RATIOS



80 % PLA – 20 % PP

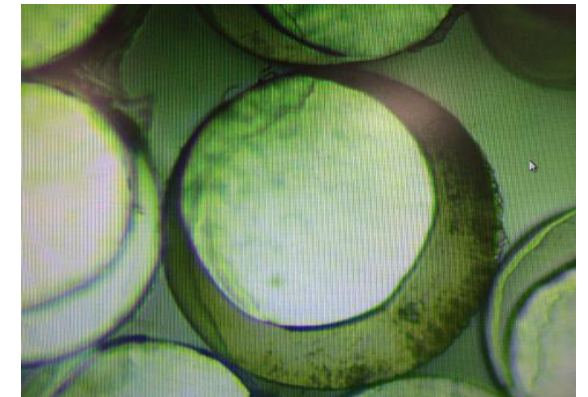
60% PLA – 40 % PP



50 % PLA - 50 % PP

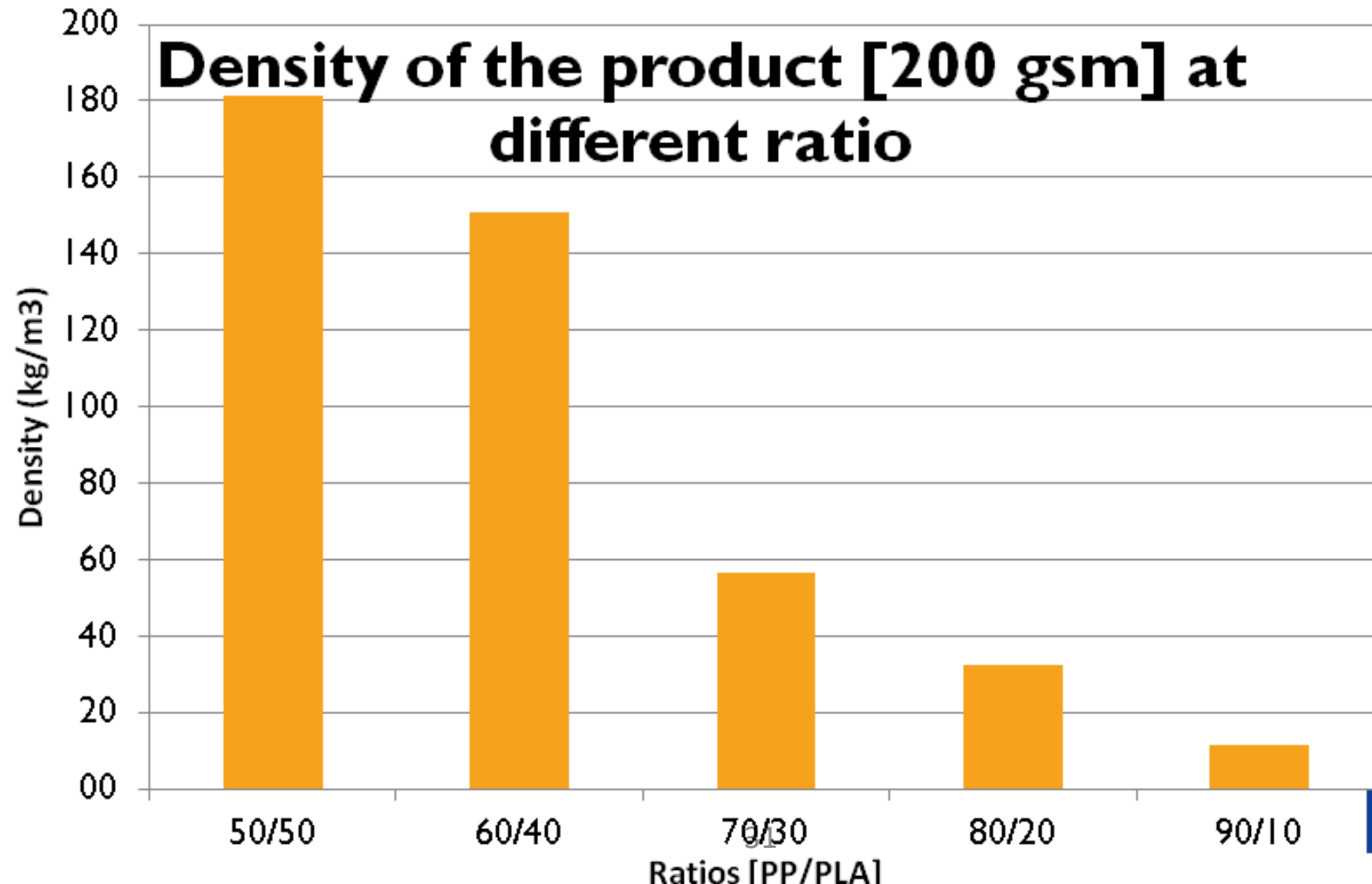


10 % PLA – 90 % PP



PLA IS SUSTAINABLE, BIOPOLYMER, ETC
PP IS THE MOST AVAILABLE PLASTIC

MATERIAL DENSITY AS A FUNCTION OF POLYMER RATIO



PRODUCT DIVERSIFICATION



Samples
photographed at
the CETI
headquarters,



UNIQUE PRODUCT

- Multicomponent
- Continuous Filament
- Spunlaid Process -> Simple Process
- No Thermal nor Mechanical Bonding
- Tremendous Product Functionality & Flexibility
- Suitable for downstream: Cross Lapping, Needled Punch, Thermal Bonding, Hydroentangle, ...
- Patent Pending ...

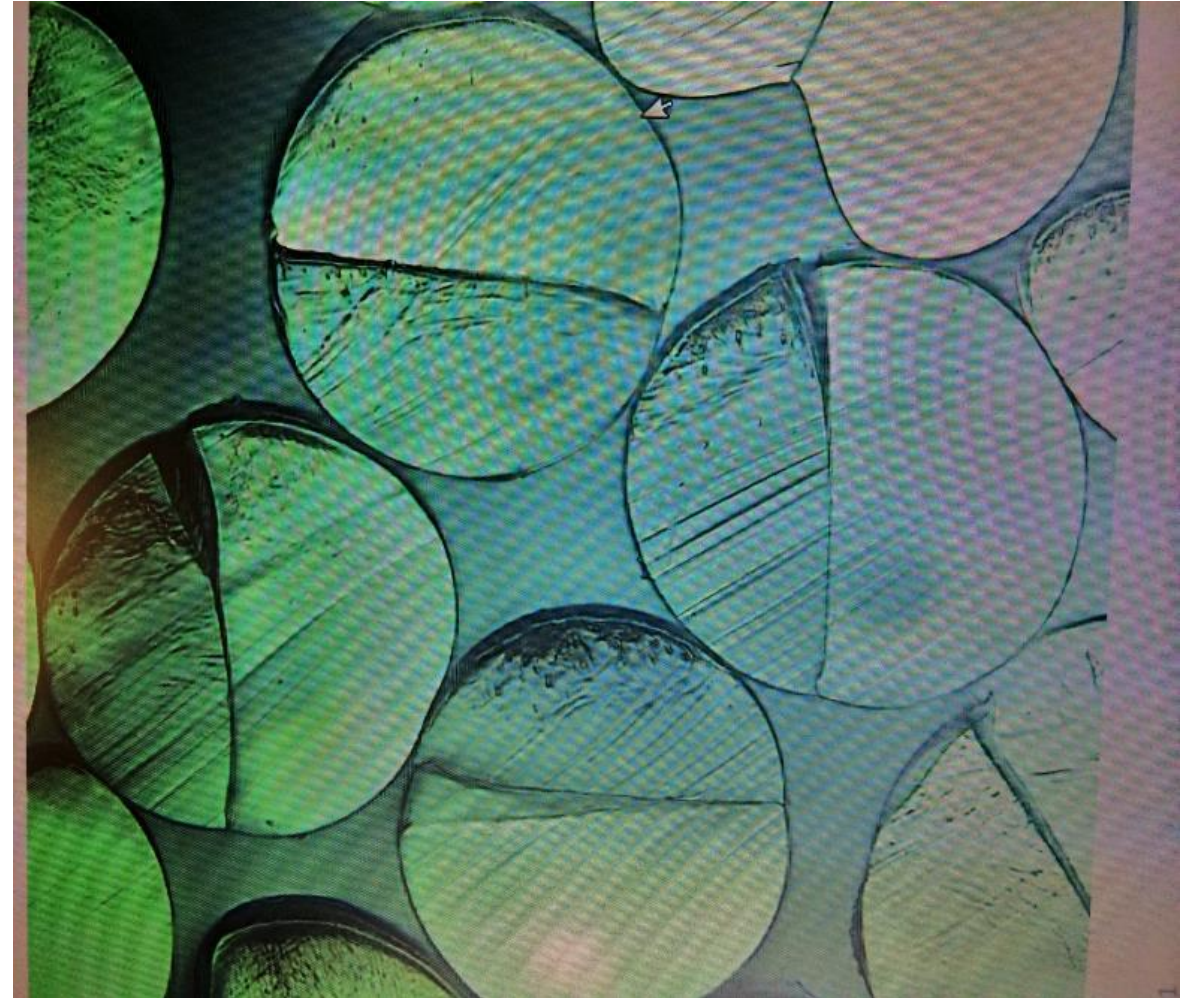
PRODUCT CHARACTERISTICS

Main Feature: Enhance Functionality just by changing polymers ratio and/or fiber structure

- Loftiness
- Resilience
- Stretchiness
- Strength - Inner bonding
- Wettability
- Memory , Shape, etc

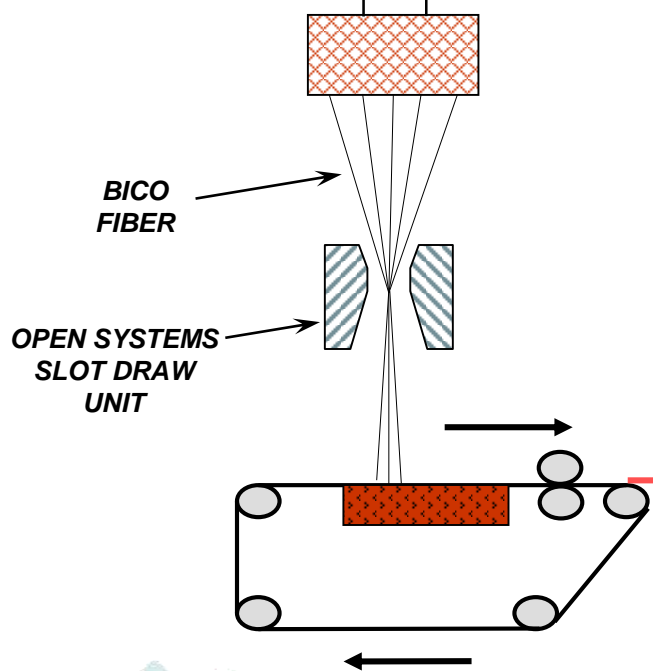
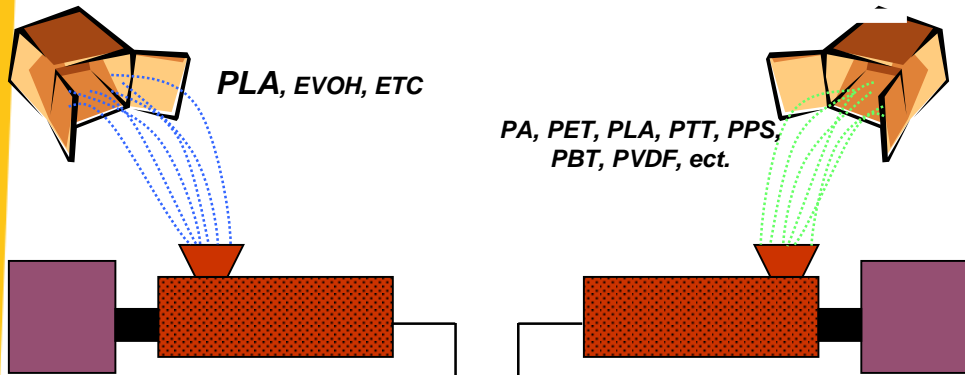
HYGIENE MARKET

- Light Weight
- Loftiness
- Softness
- Resilience
- Strength
- Stretching
- Wettability
- Sustainability
-

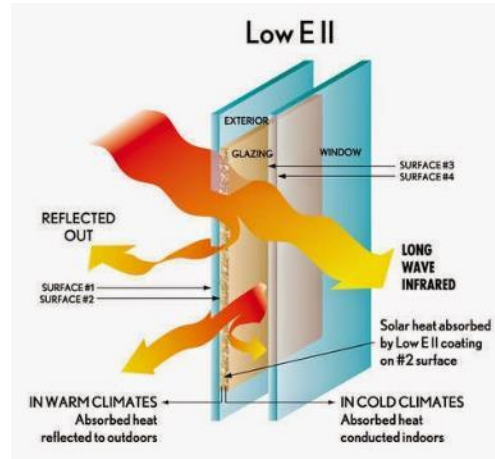
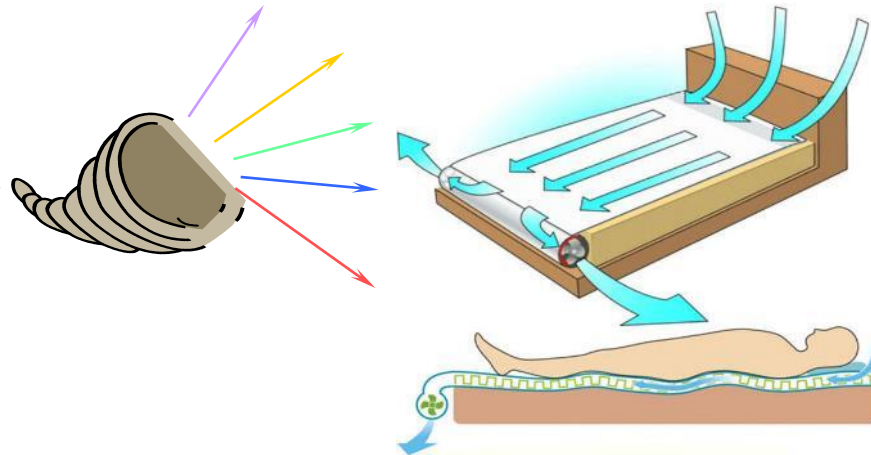


OTHER APPLICATIONS

- Thermal Insulation K value = 0.229, <5 Kg/m³
- Acoustic Insulation
- Filtration
- Acquisition/Distribution layer
- Textile Application
- Medical



TEXTILE PROCESSING



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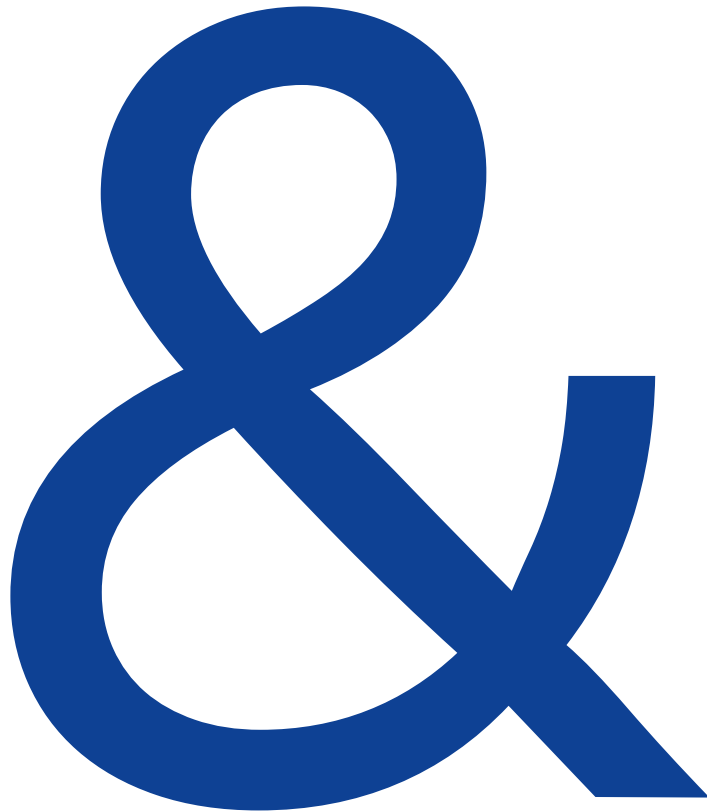


THE RESULT

Spunbond (Spunlaid) material is NOT a 2D structure any more

Lofty Spunbond is here

THANK YOU !!!



CETI

Hills Inc

NatureWorks LLC