Welcome to the world of fibers

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Company data

- Established in 1878
- Independent family company
- More than 1.800 employees
- 19 production plants in Europe, USA, India, Mexico
- 3 locations of R&D in Germany, USA, India

The JRS plants worldwide


JRS Holzmühle, D


JRS HN, D


JRS Bremen, D


JRS Calenberg, D


CTL Lodenau, D


JRS Ellwangen, D


JRS Kiel, D


MCW Weissenborn, D


CHP Pirna, D


JRS Pharma, FI


JRS, UK


GMW, IN


JRS I (Pharma) and II (Food)


Cedar Rapids, USA


JRS Schoolcraft, USA

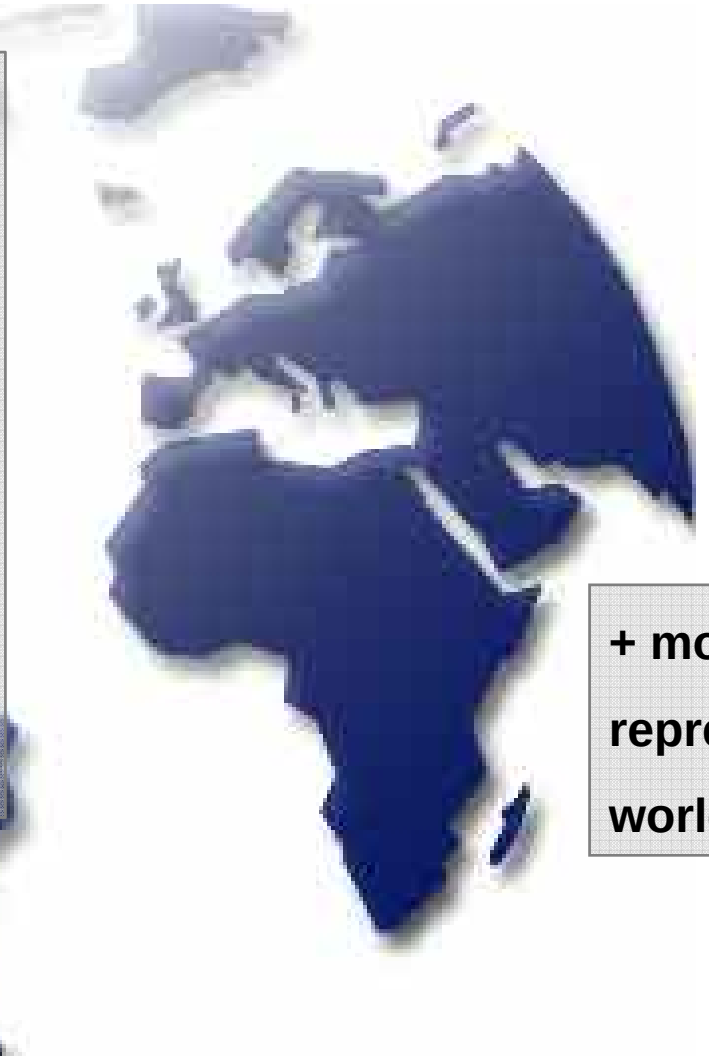

JRS Portage, USA


Demacsa, MX

JRS and our partners are everywhere

Our own offices:

Asia/ Pacific	Italy
Austria	Japan
Benelux	Latin America
China	Mexico
Czech Republic	Poland
England	Russia
Finland	Spain
France	Sweden
India	USA



+ more than 200 representatives world-wide !

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The JRS Business Units

JRS Pharma

Food

Road Construction

Contract Manufacturing

Innovation

Industrial Applications

Chemistry

Technical Applications

Filtration

Animal Nutrition

Pet Care

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JRS brands

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Your innovation partner JRS

- **Application Service**
- **R+D Laboratories**
  (in Germany, USA, India)
- **Pilot Plants**
- **Co-operations with**
  - universities
  - specialized institutes
  - research partners

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JRS stands for Quality

DIN EN ISO 9001:2000

HACCP

IFS

DIN EN 45011 (Feed)

PEFC

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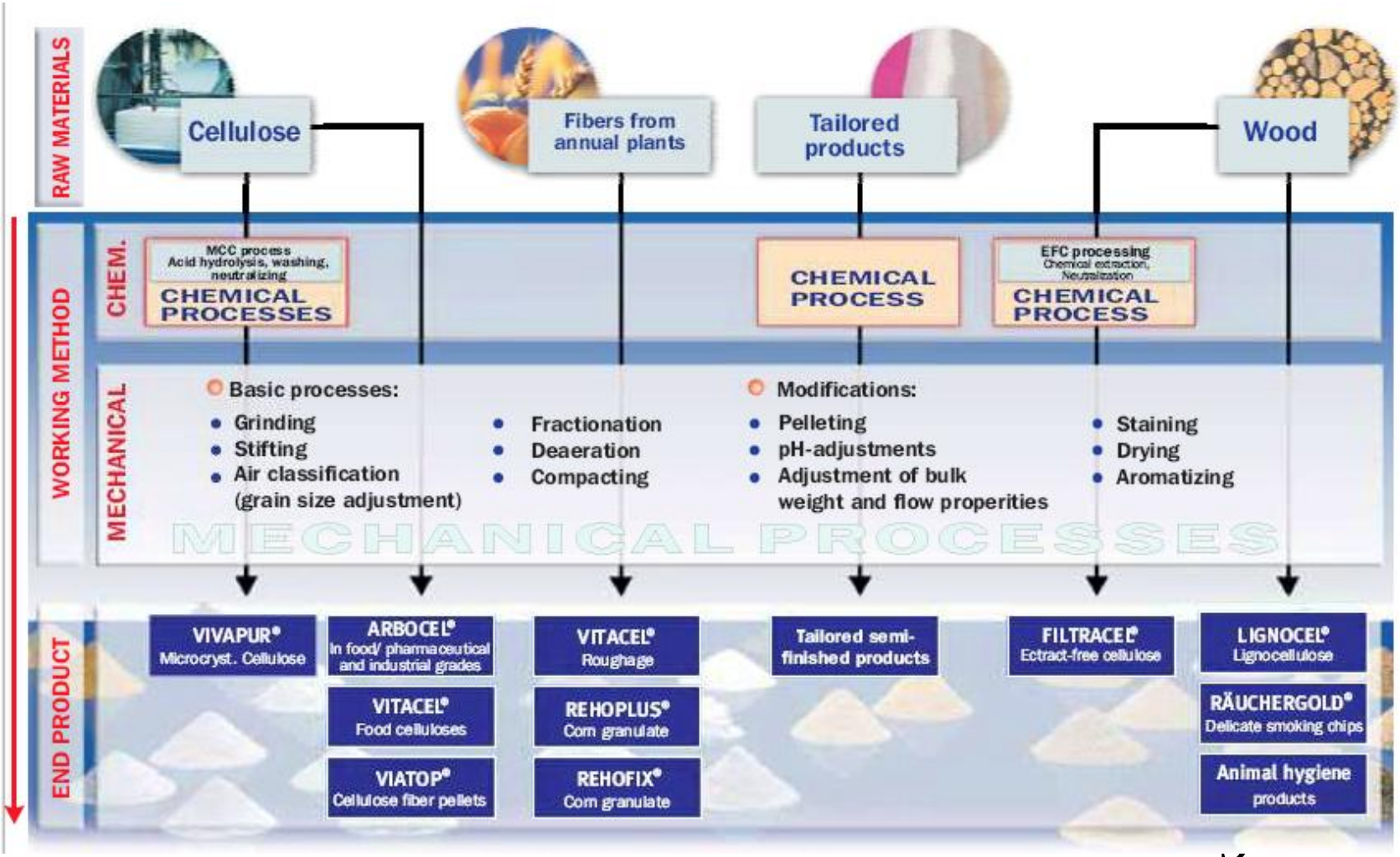
JRS core competence



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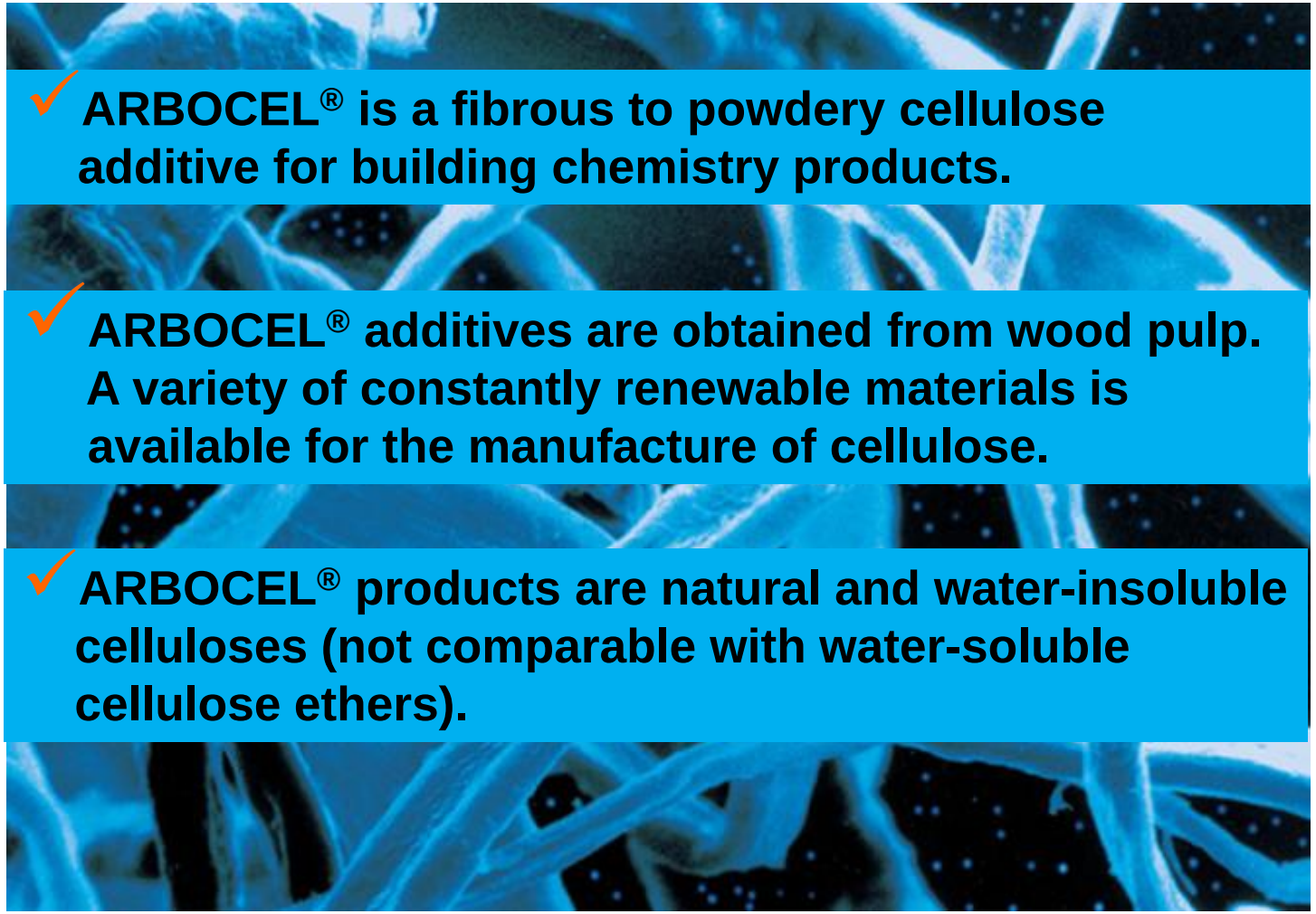
What is ARBOCEL® and what properties does it have

What is ARBOCEL®?



- ARBOCEL® is a fibrous to powdery cellulose additive for building chemistry products.
- ARBOCEL® additives are obtained from wood pulp. A variety of constantly renewable materials is available for the manufacture of cellulose.
- ARBOCEL® products are natural and water-insoluble celluloses (not comparable with water-soluble cellulose ethers).

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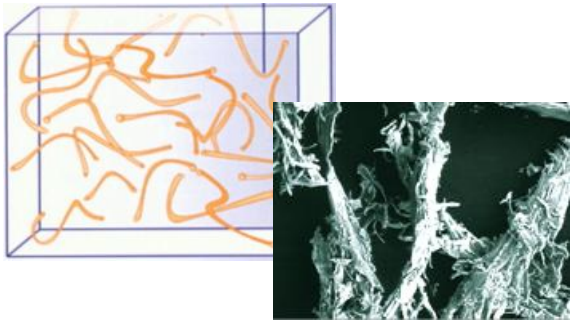
Optimization through ARBOCEL®
- The main functionalities -

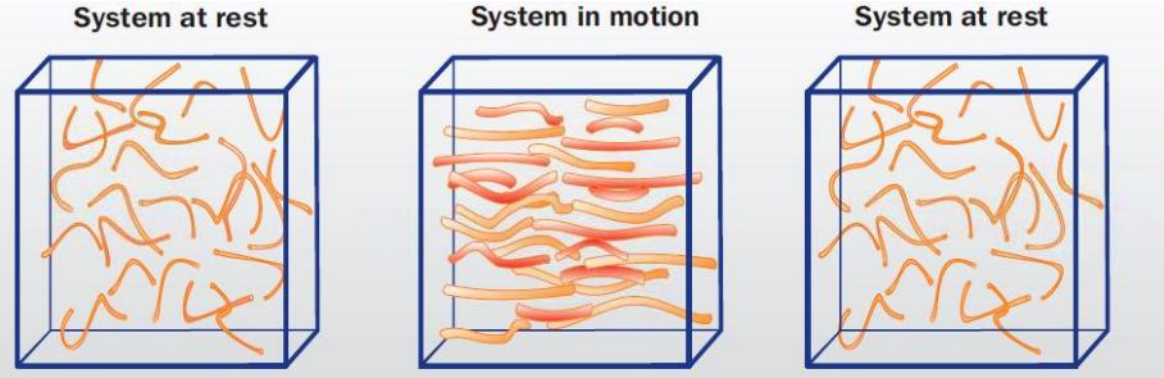
Strong thickening effect

ARBOCEL® forms a three-dimenstional framework.
→ Thickening effect



Structural viscous behavior

When shear forces act on the system some of the liquid trapped in the fiber structure is released into the matrix and the fibers align along the flow direction.
→ Improved processing characteristics



Framework by ARBOCEL®

Fibers align in flow direction
→ decrease of viscosity

Framework by ARBOCEL®

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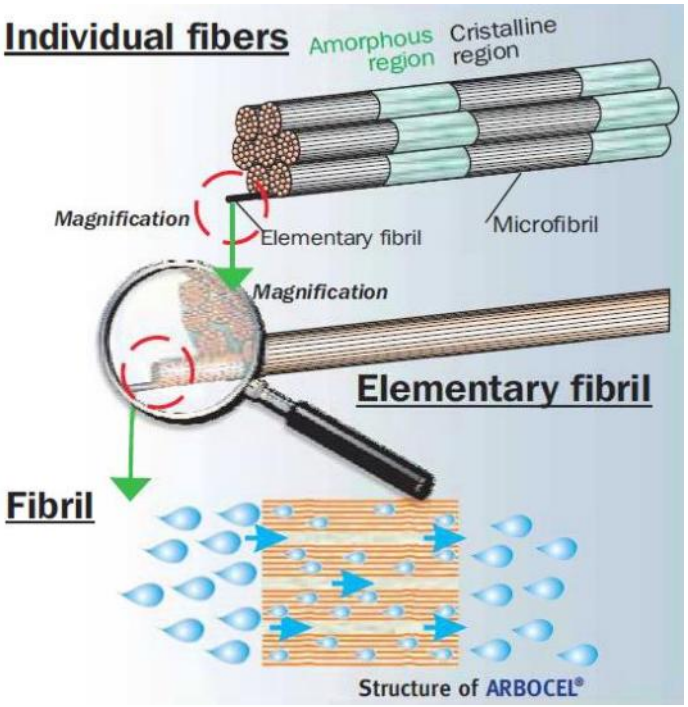
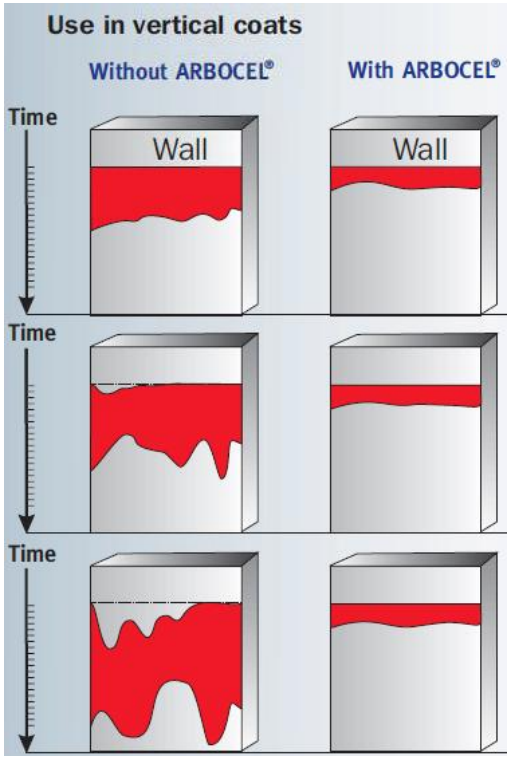
Optimization through ARBOCEL®
- The main functionalities -

Good liquid absorption capacity



Absorbtion and transport of liquid by the capillaries of ARBOCEL®

Better slump resistance

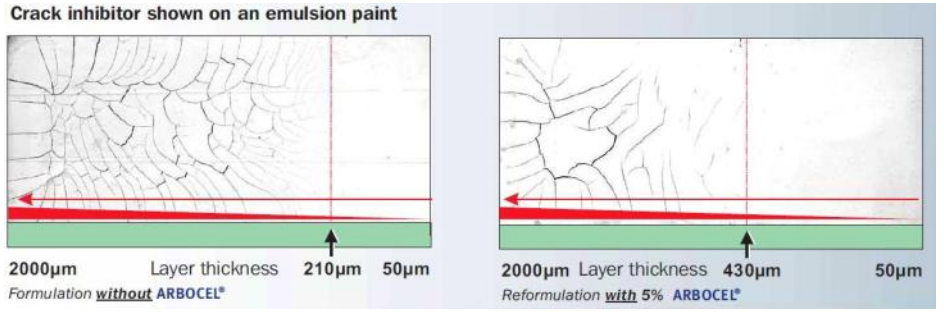


→ No slippage during processing

Optimization through ARBOCEL®
- The main functionalities -

Crack inhibitor

Mechanical energy generated during setting process is absorbed by the reinforcing fibers.



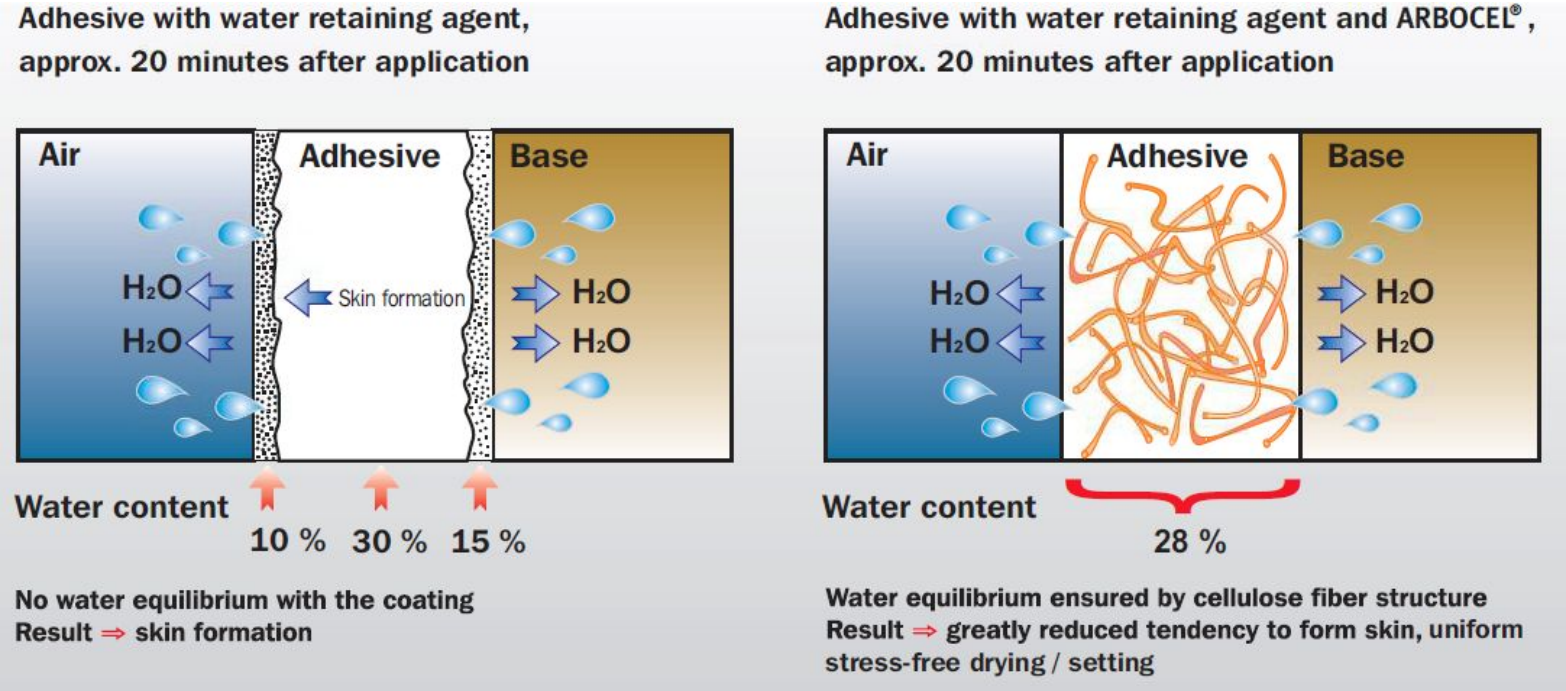
Reduced shrinkage

Reduces shrinkage by fiber reinforcement of ARBOCEL®.

Optimization through ARBOCEL®
- The main functionalities -

Longer „open time“

ARBOCEL® transports the fluid from inside to the surface.
→ Homogeneous drying / setting process
→ Longer „open time“



Increase in viscosity through ARBOCEL®

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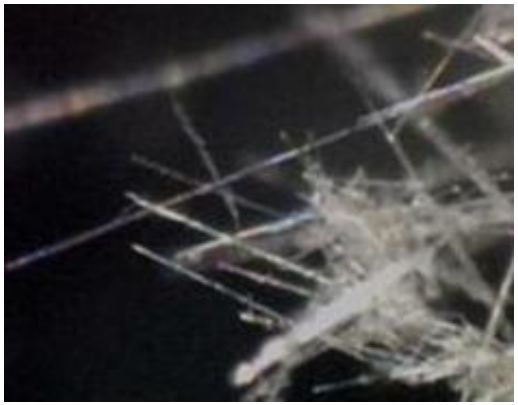
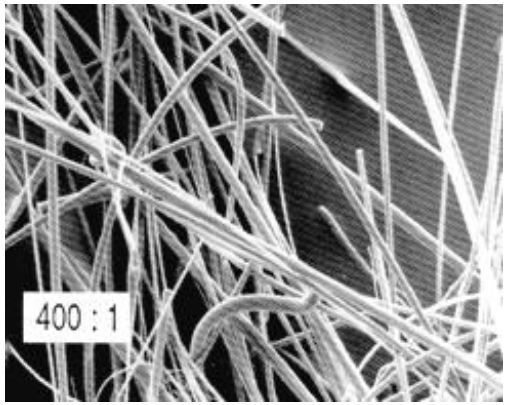
Comparison ARBOCEL® / artificial fibre

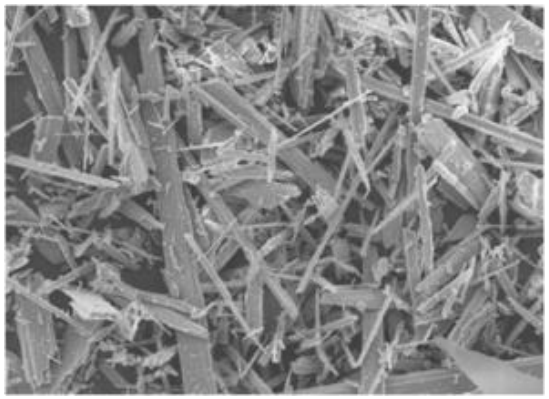


Asbestos

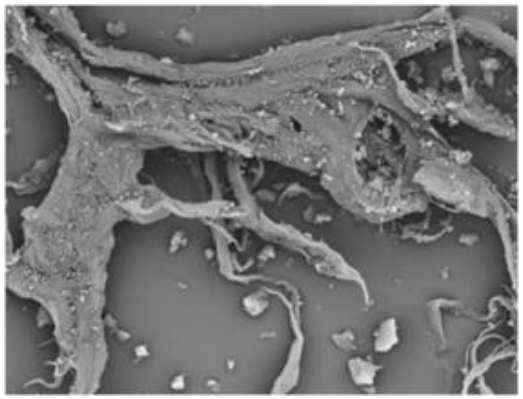


Glass-fibre

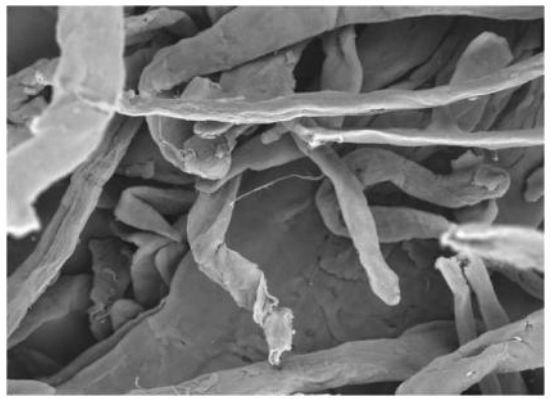
PE- fiber



Wollostanite



SYLOTHIX ®



ARBOCEL®

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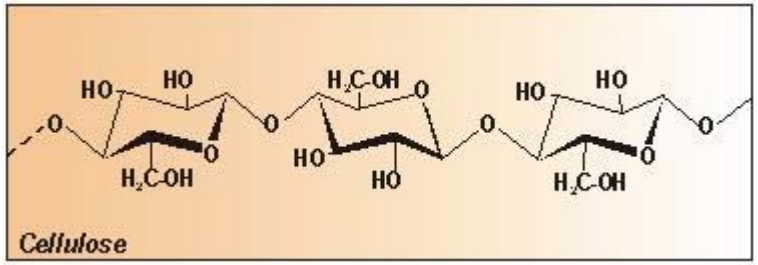
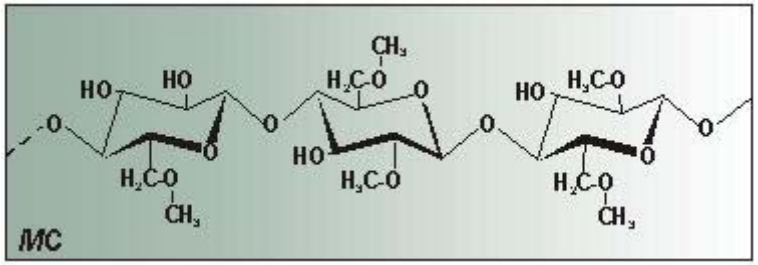
Functionality of ARBOCEL® compared to the PE-fiber

A B C D E

A	Cement PZ 42,5 – without fiber	w/c = 0,480
B	+ 1 % ARBOCEL® ZZC 500	w/c = 0,512
C	+ 2 % ARBOCEL® ZZC 500	w/c = 0,535
D	+ 1 % PE shear fiber 4 mm	w/c = 0,505
E	+ 2 % PE shear fiber 4 mm	w/c = 0,520

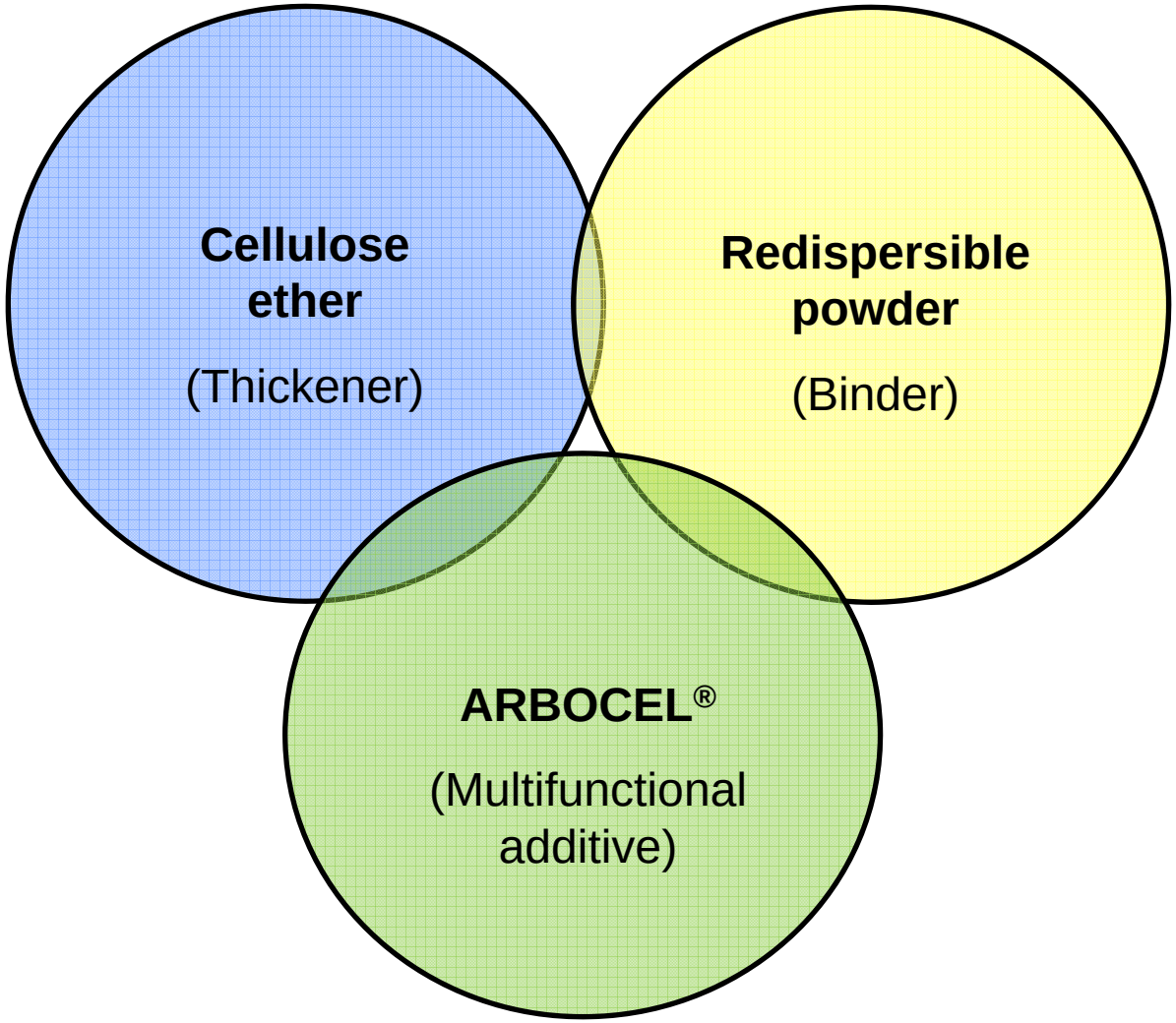
Common properties and differences Cellulose fiber – Cellulose ether





	Cellulose fiber	Cellulose ether
Water solublility	No	Yes
Stickiness	No	Yes
Water-binding capacity	Present	Pronounced
Viscosity increase	Yes, but less than with cellulose ether	Yes

Correlation of the additives in building chemistry applications



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ARBOCEL® main classification

Raw material	→	Leaf- or softwood pulp
Fiber thickness	→	20 µm leaf- and 35 µm softwood
Purity / color	→	White, off-white or grey
Fiber length	→	20 µm up to 2000 µm

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Typical applications for ARBOCEL® in building chemistry

Application fields

Finishing plaster

Bonding plaster

Fillers / putties

ARBOCEL®

Tile adhesives

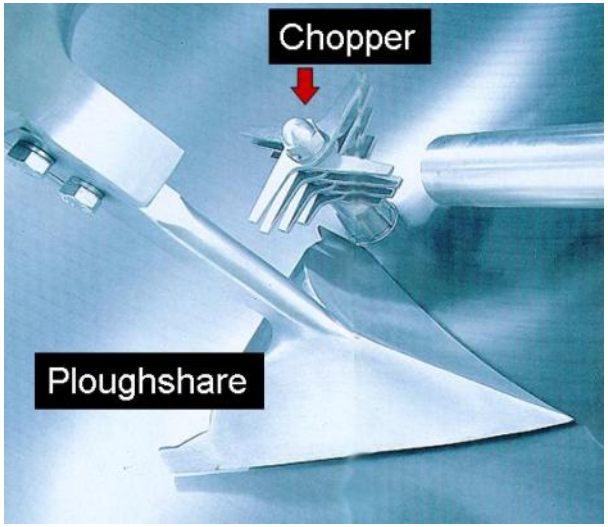
Adhesive mortar

Joint sealing

Mortar

Mixers

Ploughshare mixer



Dissolver – laboratory mixer

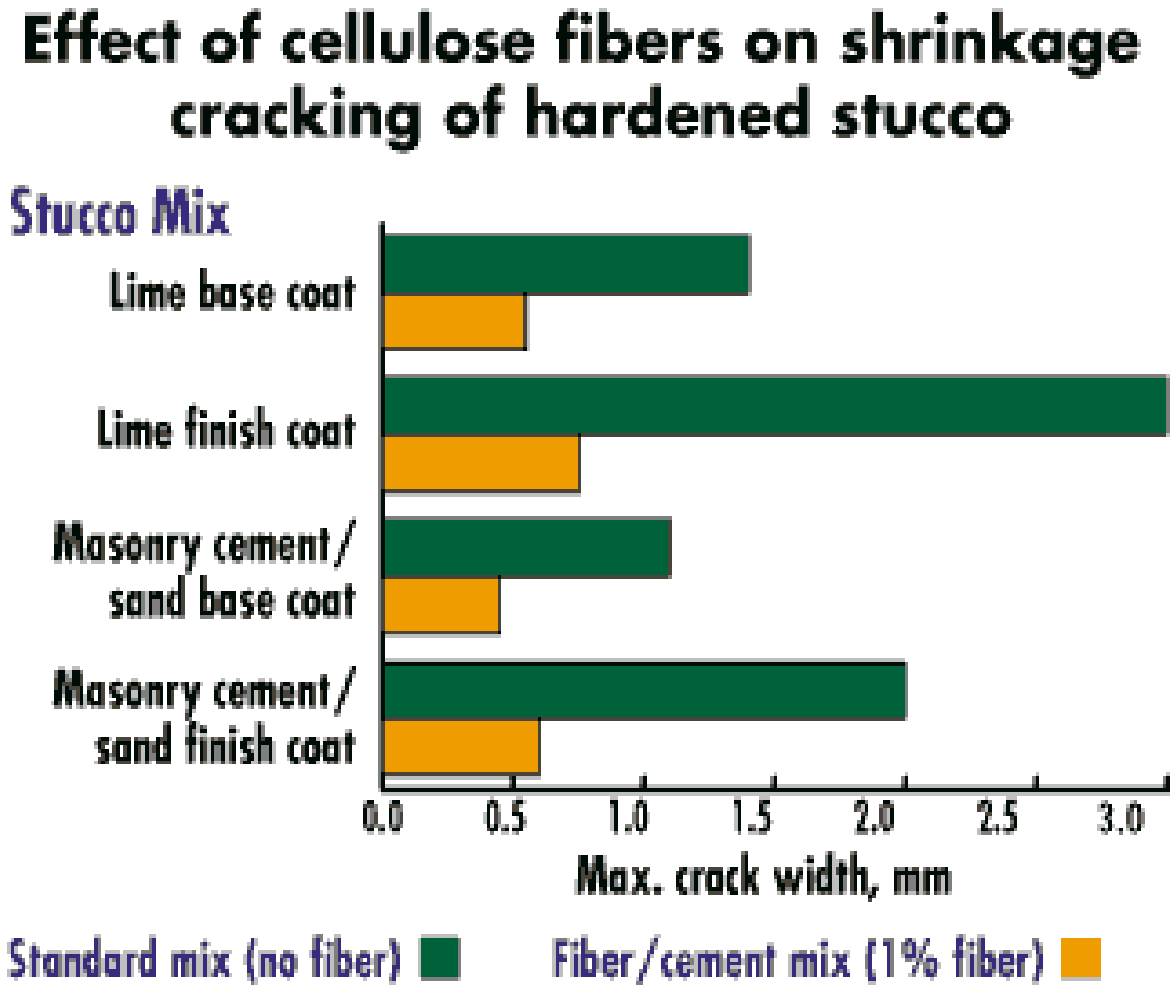
Mineral finishing plaster / maisonaries

Binder: cement, cement / lime

0.4 - 1.0 % ARBOCEL® PWC 500

- **better workability**
- **better standability**
- **crack resistance in green stage**

ARBOCEL® in stucco



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Bonding plaster / rendering

Binder: plaster, plaster / lime

0.2 - 0.3 % **ARBOCEL® PWC 500 or**
ARBOCEL® ZZC 500

Binder: cement, cement / lime

0.2 - 0.3 % **ARBOCEL® PWC 500 or**
ARBOCEL® ZZC 500

- **better workability**
- **better effectivity**
- **thicker layer possible**

Cement tile adhesives (thin bed)

0.4 - 0.5 %	ARBOCEL® FD 40 or ARBOCEL® BWW 40
0.3 - 0.4 %	ARBOCEL® ZZ 8/2 CA 1

- better workability
- better standability
- longer open time

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ARBOCEL® reinforcement

Without ARBOCEL®

With ARBOCEL® after 30 min at room temperature

Joint sealings

0.4 % ARBOCEL® FD 40 or
ARBOCEL® BWW 40

- **less shrinkage**
- **cracking is reduced in green stage and during setting**

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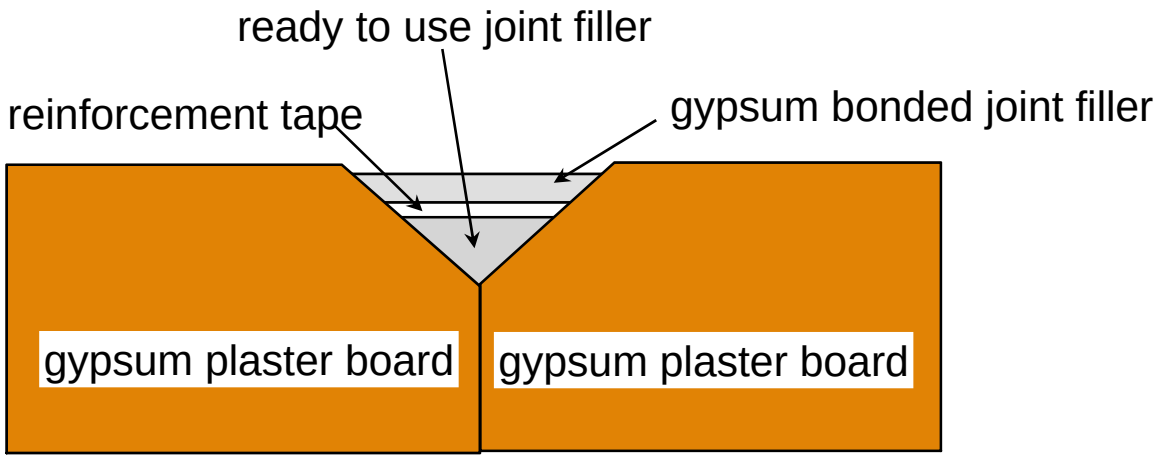
Joint filler for gypsum plaster boards

0.5 - 1.0 % ARBOCEL® FD 40 or

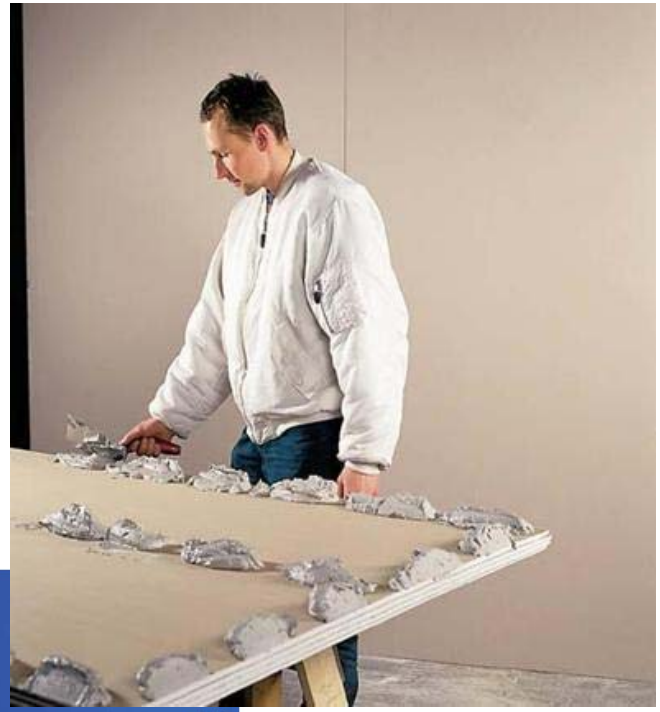
- **less shrinkage**
- **better standability**
- **better workability**
- **cracking is prevented**



Adhesive mortar

0.2 - 0.5 % **ARBOCEL® PWC 500 or ARBOCEL® ZZZ 500**

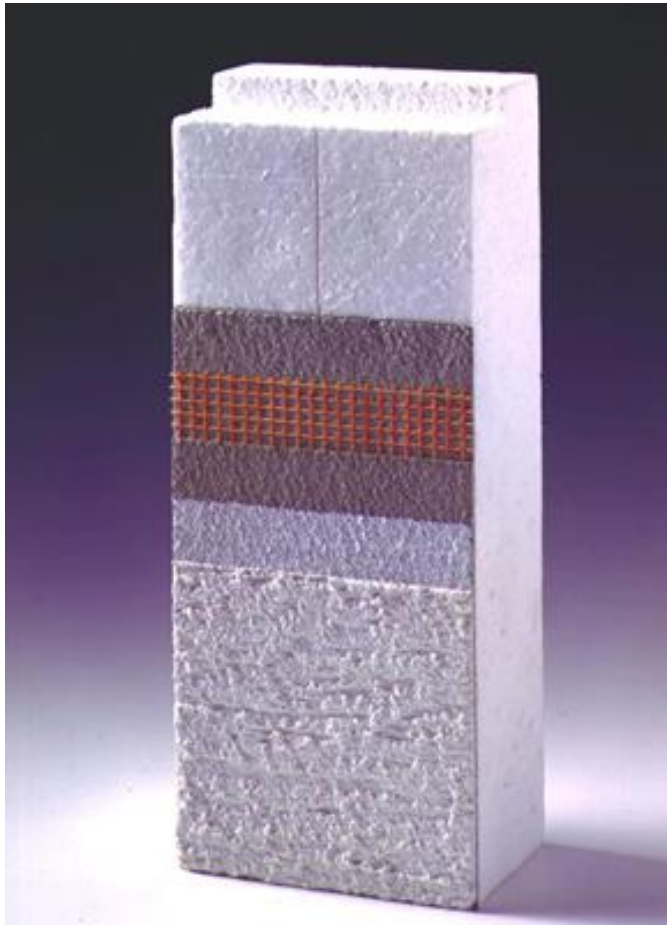
- **better rheology**
- **better workability**
- **reduced stickiness at tool**
- **better standability**
- **reduction of formulation costs possible**



EIFS

0.3 % ARBOCEL® PWC 500 or
ARBOCEL® ZZZ 500

- **better workability**
- **better standability**
- **reduction of formulation costs possible**



Extruded range spacer

0.1 - 1.0 % ARBOCEL® ZZ 8/1 G

- **extrusion aid**
- **better behaviour during green stage**
- **to optimize the formulation costs**

ARBOCEL® ready-to-use systems

Finishing texture coating

Exterior:

0.2 - 0.4 % ARBOCEL® B 400

Interior:

0.5 - 2.0 % ARBOCEL® B 400

- **better rheology**
- **better standability**
- **crack resistance**
- **better structuring**

Ready-to-use joint filler for gypsum plaster boards

0.5 - 1.0 % ARBOCEL® B 00

- crack resistance
- reduced shrinkage
- better workability
- smoothness in one step

Tile adhesive / filling compound (ready-to-use)

Tile adhesive

0.4 - 0.5 % ARBOCEL® BWW 40

- **better standability (anti-sagging)**
- **better rheology**

Filling compound

0.5 – 0.8 % ARBOCEL® B 00 or ARBOCEL ® B 600

- **crack resistance**
- **better workability**
- **reduction of shrinkage**
- **smoothness in one step**

Acrylic roof coating

0.5 - 0.8 % **ARBOCEL® BC 200 or ARBOCEL® BC 1000**

- **crack resistance**
- **higher flexibility**
- **better workability**
- **reduction of formulation costs possible**

ARBOCEL® for emulsion paints

JRS GmbH & Co. KG

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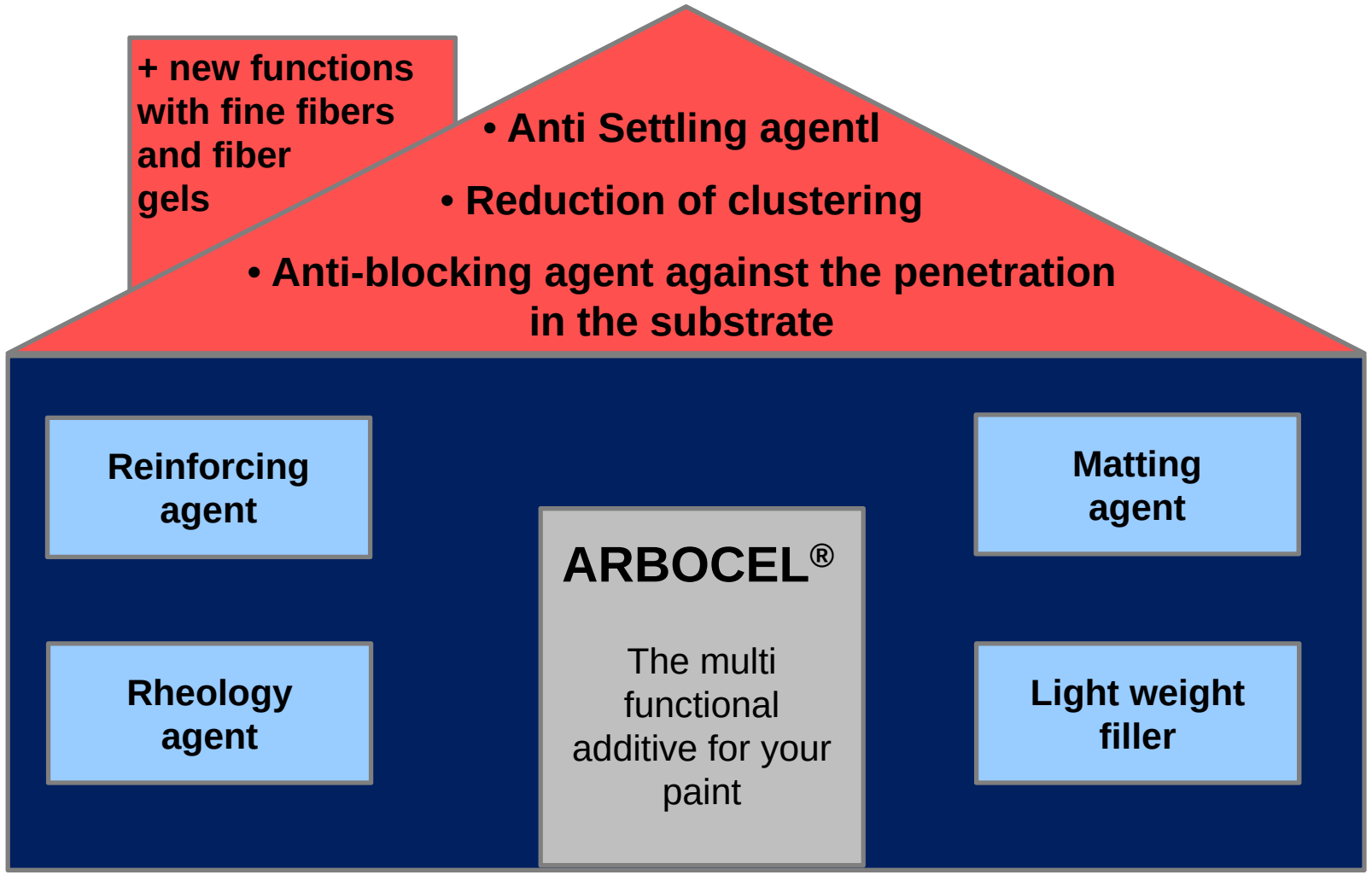
ARBOCEL® – the multi functional additiv for emulsion paints



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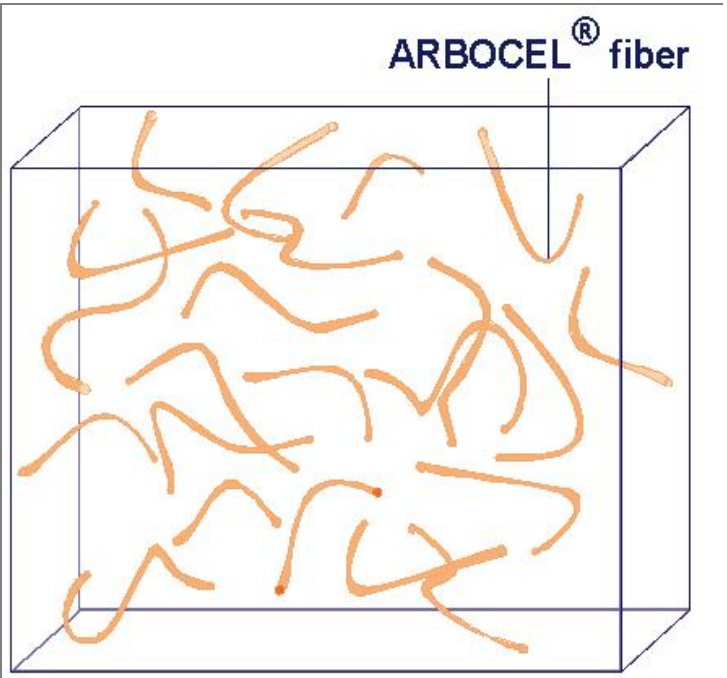
ARBOCEL® as reinforcing agent

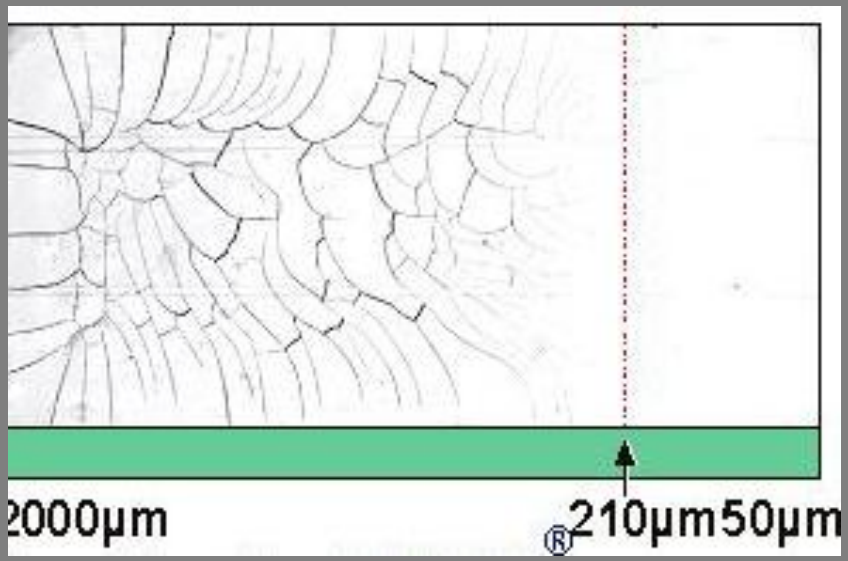
- Reduction of film tension and cracking
- Increase of the scrub resistance
- Possible reduction of the dispersing agent due to the negative surface charge



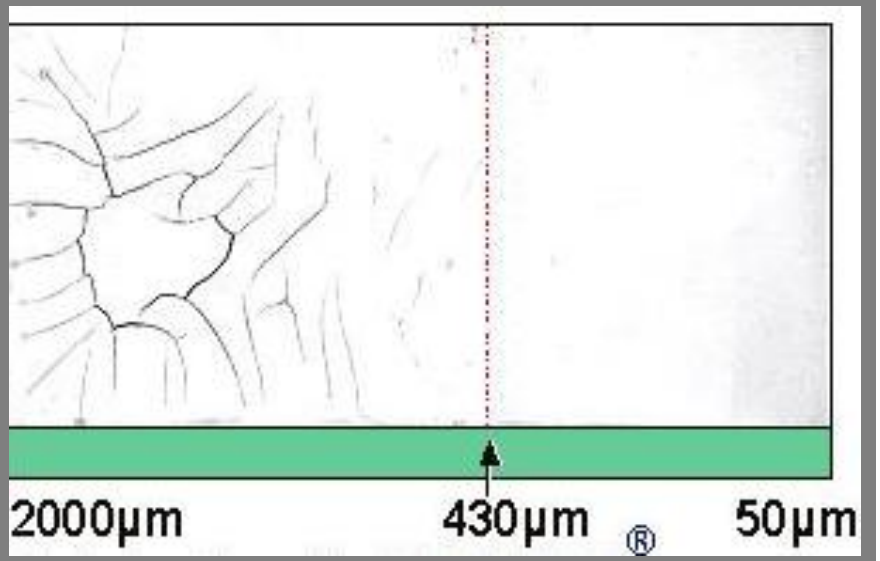
3-D fiber framework

Reduction of mud cracking

Without ARBOCEL®

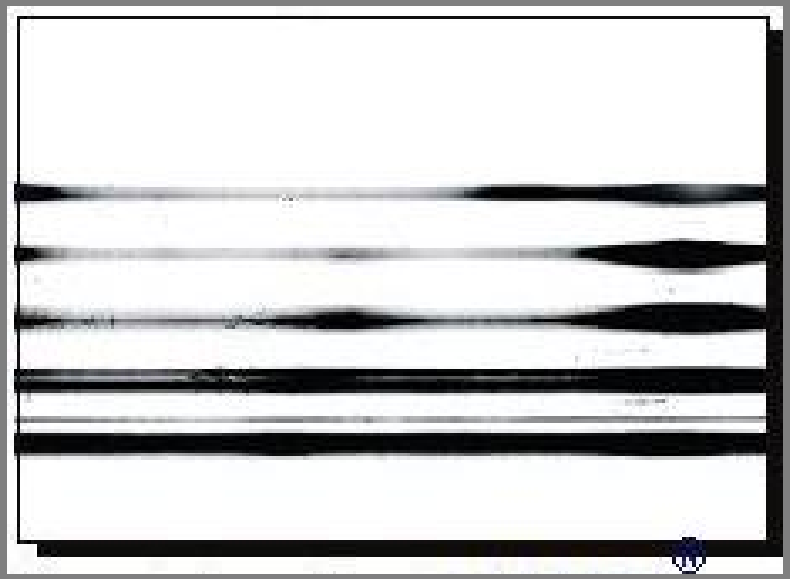


With 5% ARBOCEL®

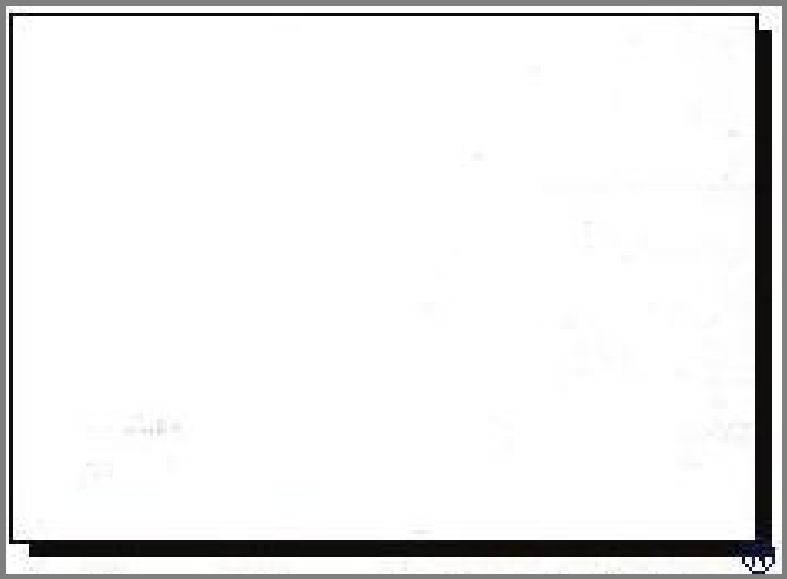


Optimization of the wet scrub resistance (DIN 53778)

Without ARBOCEL®



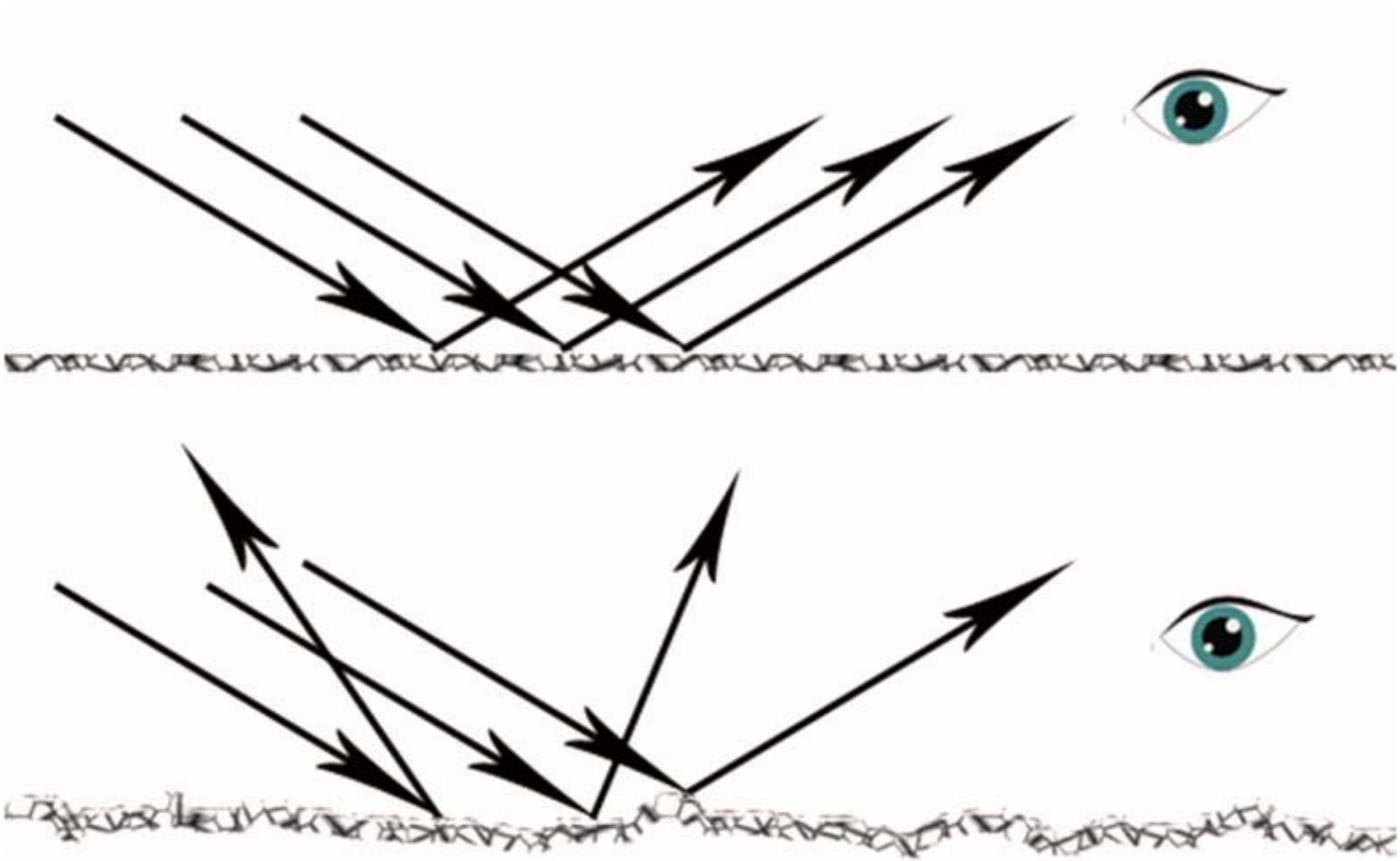
With 5% ARBOCEL®



ARBOCEL® as matting agent

- ARBOCEL® makes a micro-rough surface and brings so a sheen reduction
- The higher the quantity, the stronger the matting effect
- Enables a lap free application

Influence of ARBOCEL® on the sheen



ARBOCEL® as leight weight filler

- **ARBOCEL® has a low density of about 1,3 g/cm³**
- **Possible to increase the water (1 part ARBOCEL® = approx. 2 parts of water)**

ARBOCEL® als rheology agent

- Structurally visose behaviour througth significant fiber structure
- Easier workability
- Spatter resistance can be improved (similar effect as associative thickener)

Higher spatter resistance

Without ARBOCEL®

With 5% ARBOCEL®

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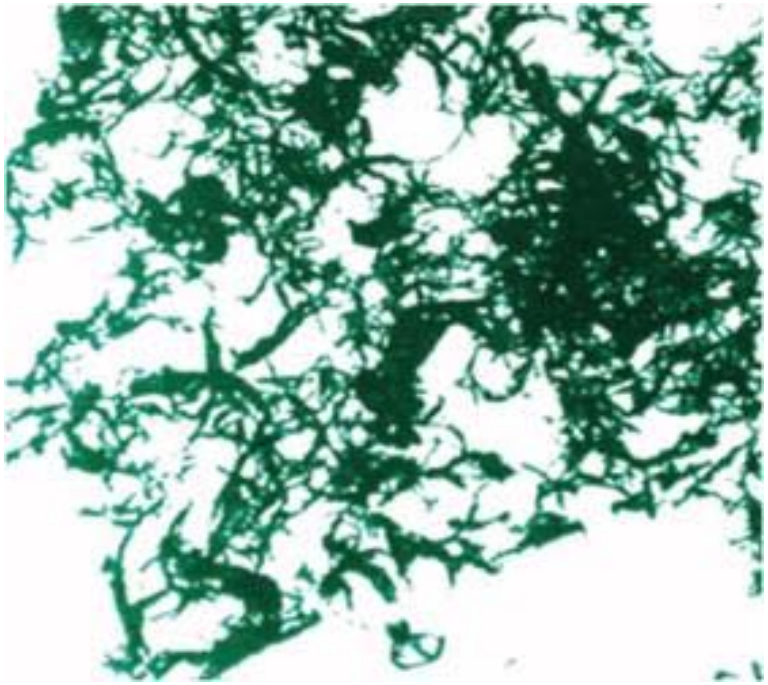
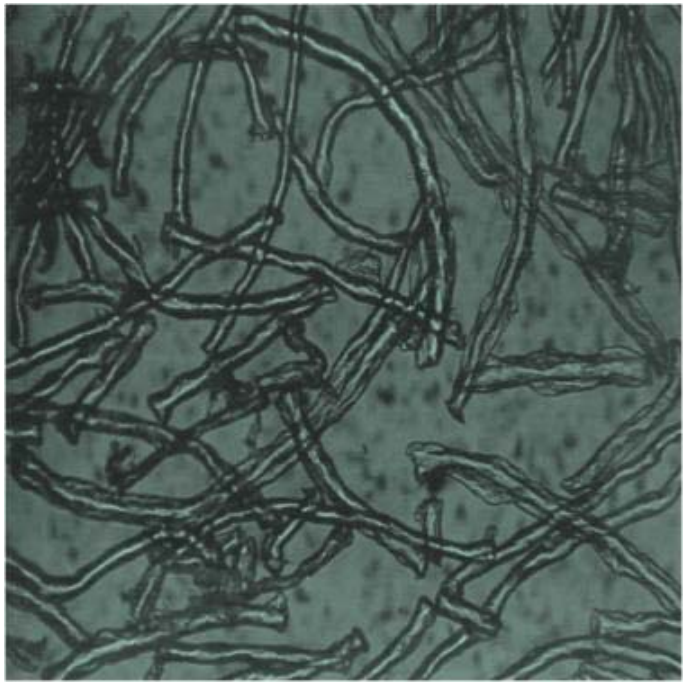
SYLOTHIX® and ARBOTHIX®

Difference between SYLOTHIX® and standard PE-fiber



ARBOTHIX® PE 100



Standard PE Faser

SYLOTHIX®51, 52, 53 - und *ARBOTHIX® PE 100 - Product Description and Physical Data

* **ARBOTHIX® PE 100** is equivalent in its properties to the **SYLOTHIX®** product series and complements it.

Type	SYLOTHIX® 51	SYLOTHIX® 52	SYLOTHIX® 53	*ARBOTHIX® PE 100
Fibre length	400 µm	400 µm	100 µm	100 µm
Proportion of amorphous silicic acid (particle size 3 µm)	-	approx. 60%	approx. 50%	-
Humidity	max. 2%	max. 3%	max. 3%	max. 2%
Mixing ease	+	++	+++	+++
Effectiveness	+++	++	+	++
	SYLOTHIX® and **ARBOTHIX®** can build up a static electric charge during pouring. Product dust together with air may cause an ignitable and explosive mixture. **SYLOTHIX®** and **ARBOTHIX®** should be stored in a clean, dry warehouse. Opened packages should be resealed to prevent contamination of the product. The material should be used within 6 months.			
Health And Safety Information Please follow safety guidelines as well as national legislation and regulations. Additional information can be found on our Safety Data Sheet.	**SYLOTHIX® 51** is a fine polyethylene fiber and should be handled carefully to avoid the generation of dust.	**SYLOTHIX® 52** is a combination of fine size polyethylene fibres and synthetic amorphous silicic acid and should be handled carefully to avoid the generation of dusty conditions. In Germany, the absolute fine dust proportion of **SYLOTHIX® 52** cannot exceed 4 mg/m³ (Occupational Exposure Limit) during handling.	**SYLOTHIX® 53** is a combination of fine size polyethylene fibre and synthetic, amorphous silica and should be handled so as to avoid generation of dust. In Germany, the absolute fine dust proportion of **SYLOTHIX® 53** cannot exceed 4 mg/m³ (Occupational Exposure Limit) during handling.	**ARBOTHIX® PE 100** is a fine polyethylene fibre and should be handled carefully to avoid the generation of dust. In Germany during handling of **ARBOTHIX® PE 100**, the absolute fine dust proportion cannot exceed 4 mg/m³ (Occupational Exposure Limit).

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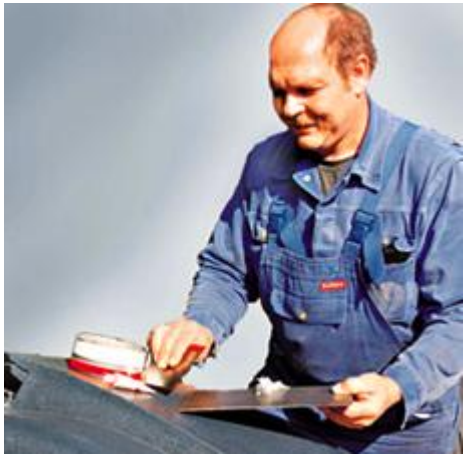
SYLOTHIX® - Applications

Coating compounds



Fillers

based on

- epoxy
- bitumen
- polyester
- PVC
- polyurethane

2 C-filling pastes

Bitumen applications

Adhesives and sealants

SYLOTHIX® - Applications

... further applications are for example:

- Protective Coatings
- Waterproofing
- Gel coats
- Coating against corrosion
- Road marking paint
- Concrete repair
- Adhesives
- Marine paints
- Putties
- Roof coating

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LIGNOCEL®

- Woodchip wall-paper
- Carpet cleaner
- Wood putty
- …

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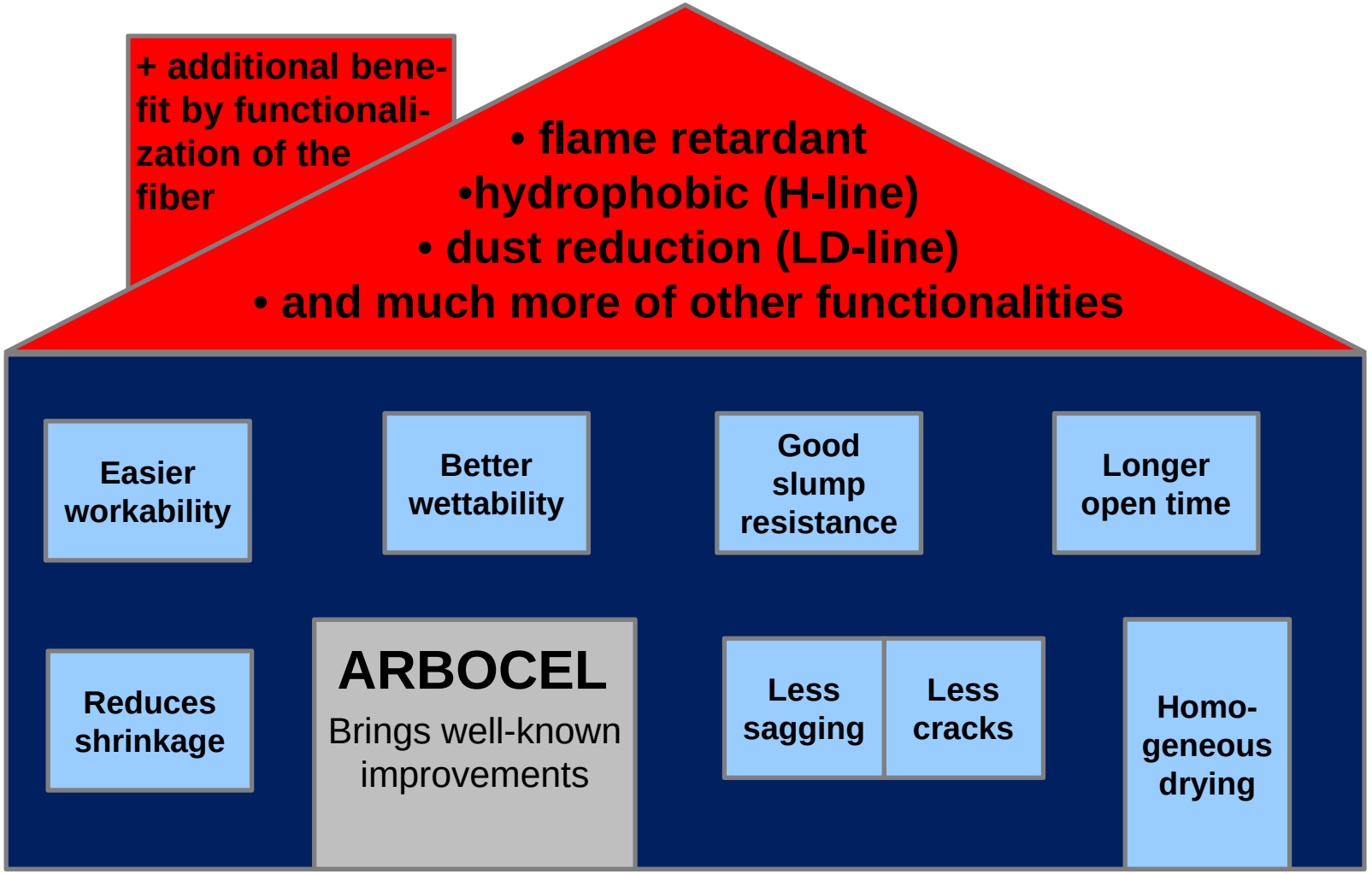
NEW!

Functionalized fibers for additional customers benefit



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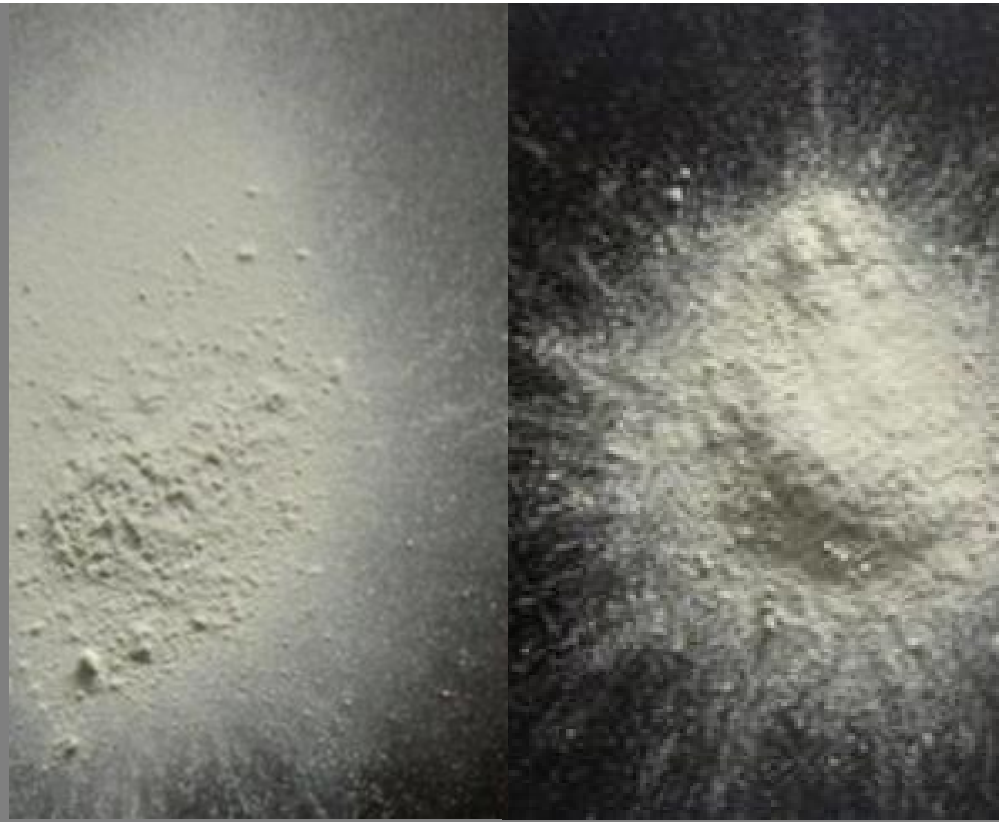
ARBOCEL® LD fibers for low dust products

JRS Germany



Dust reduction with ARBOCEL® LD

No additional product needed (purchase / stock)

No additional investment in equipments

Additive already existing in formulation with extra benefit

Easier handling as common solutions

Realizable in each production plant

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Dust-reduction with ARBOCEL LD for dry mortar products

Dry mortar without ARBOCEL

0.6% ARBOCEL BWW 40-33 LD

0.6% ARBOCEL PWC 500-33 LD

0.6% ARBOCEL ZZC 500-33 LD

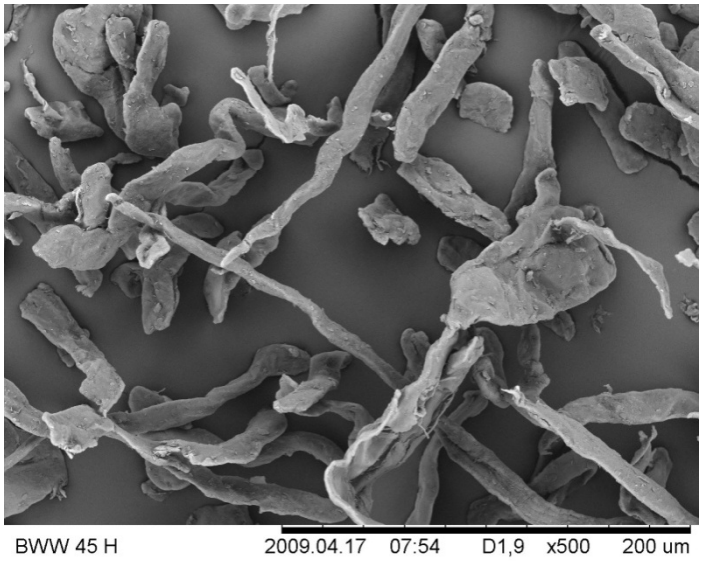
Stand: 03/2012

ARBOCEL® BWW 45 H functionalized fiber for SLC

JRS Germany

What is ARBOCEL® BWW 45 H ?

- hydrophobic modified fiber
  → in general the water-cement-factor does not need to be adjusted
- based on natural raw material
- average fiber length 200 µm
- average fiber thickness 20 µm
- bulk density 105 g/l – 160 g/l



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Advantages of ARBOCEL® BWW 45 H

Without ARBOCEL® BWW 45 H

With ARBOCEL® BWW 45 H

- reduction of sedimentation

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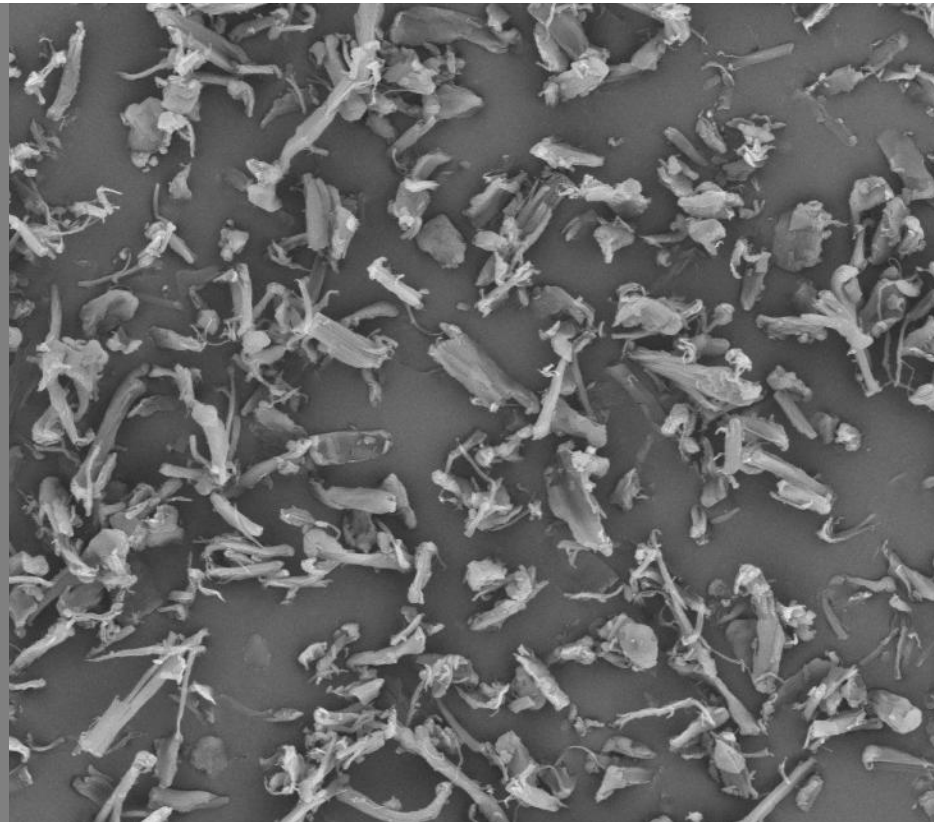
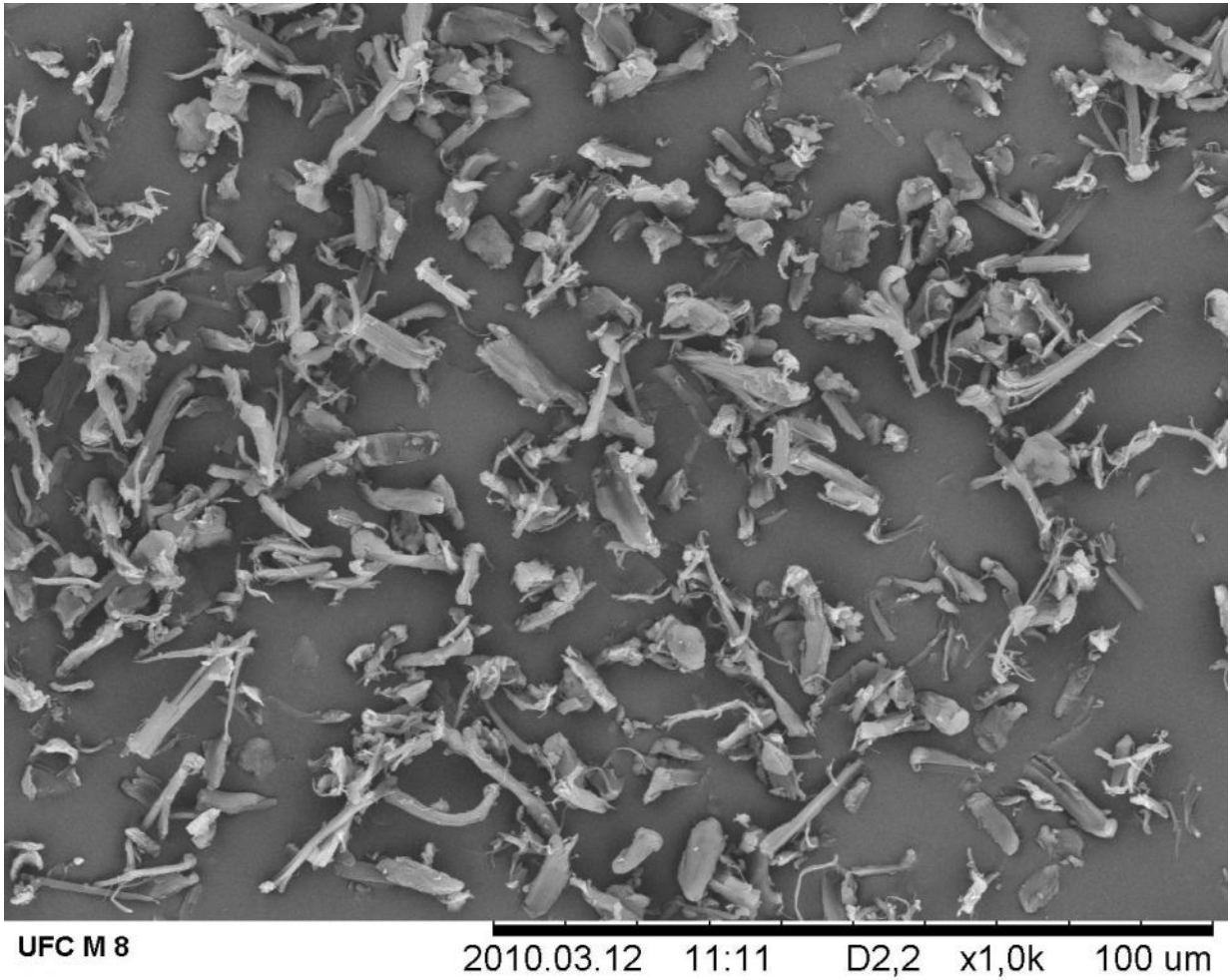
Fine ARBOCEL® grades

JRS Germany



ARBOCEL® UFC M 8
- the ultra fine cellulose

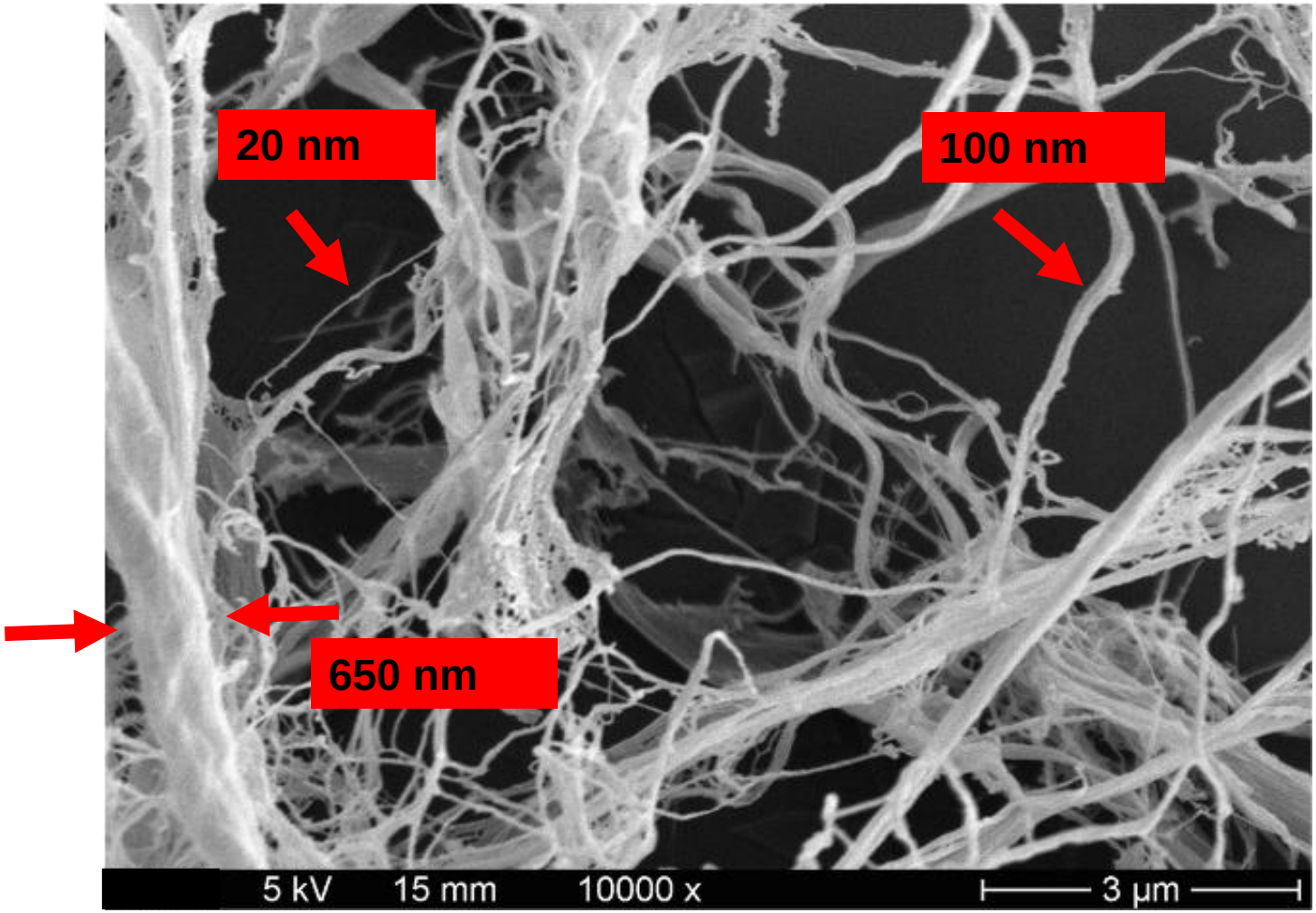


Ø particle size ($d_{50\%}$):
8 µm

Bulk density:
160 g/l

Delivery form:
Pulver

ARBOCEL® MFC
- the micro fibrillated cellulose



Bulk density:
ca. 1.5 g/cm^3

Ø Fiber length:
ca. 100 µm

Ø Fiber thickness:
ca. 0,1 µm

Delivery form:
Paste with 15-25 % sc

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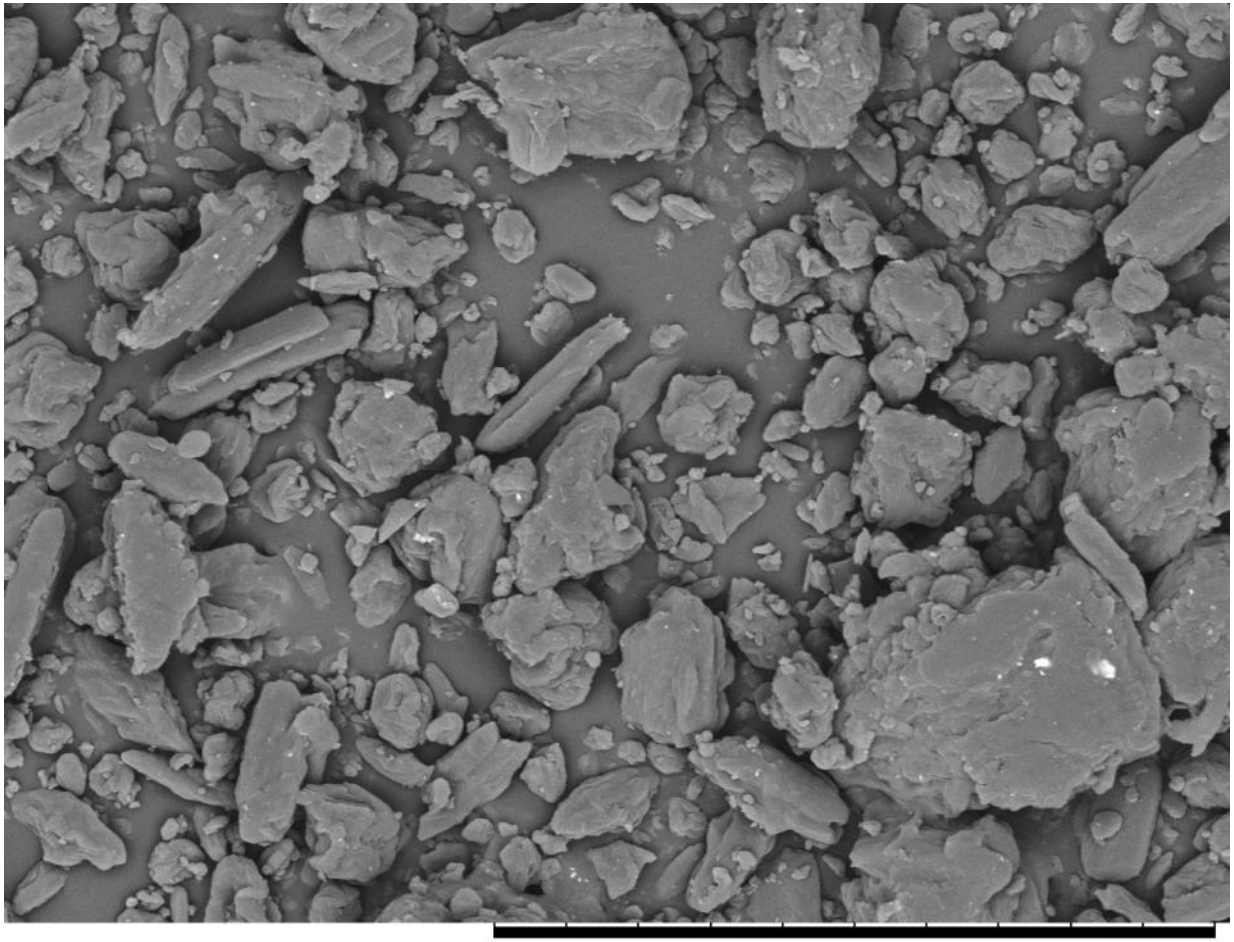
ARBOCEL® P 4.000 - the fiber gel



Ø Particle size:
< 10 µm, dispergiert

Bulk density:
420 – 650 g/l

Delivery form:
Pulver

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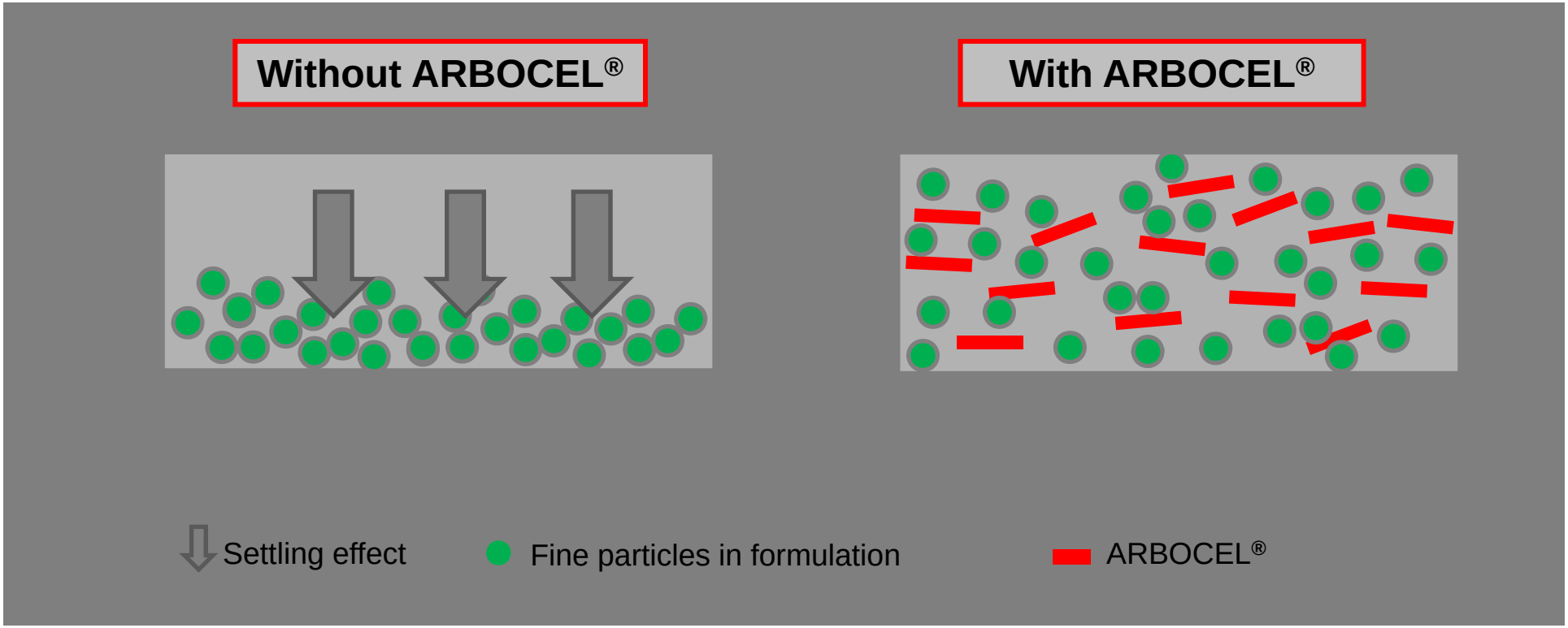
ARBOCEL® as Anti-Settling agent



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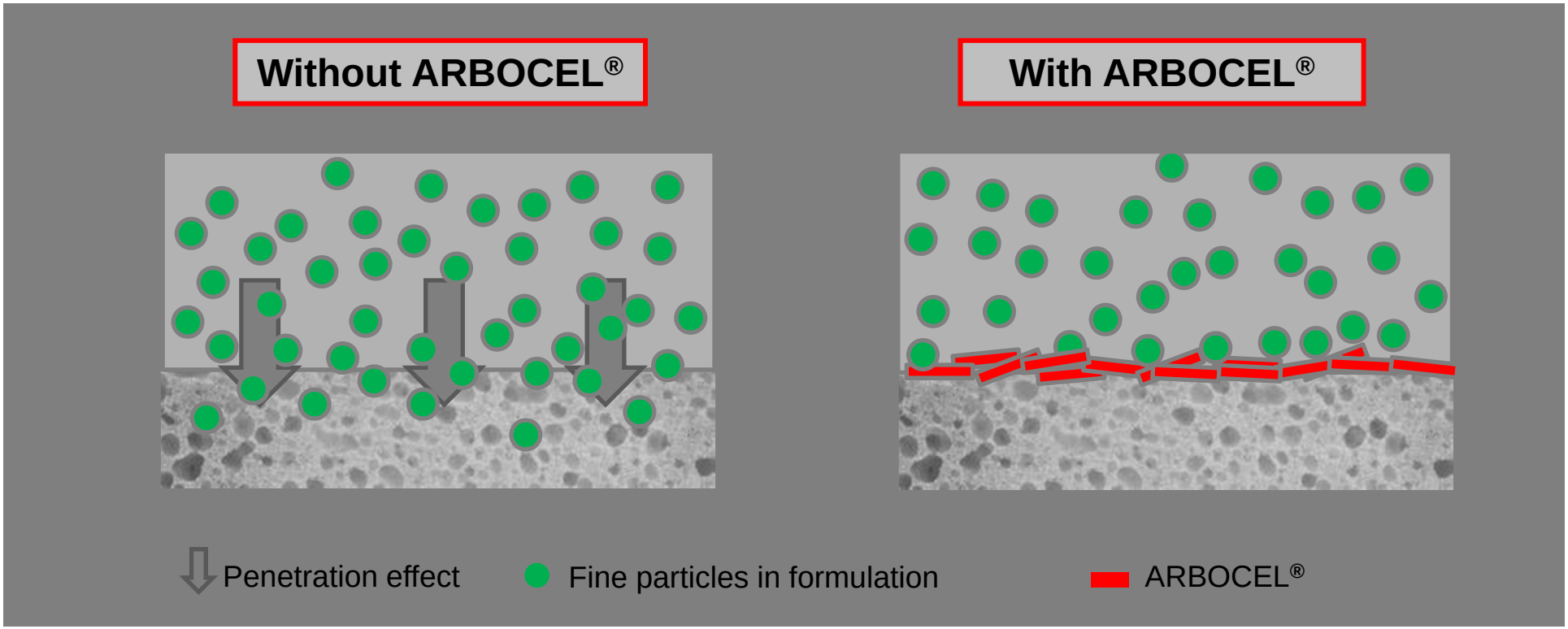
ARBOCEL® as blocking agent against penetration in the substrate



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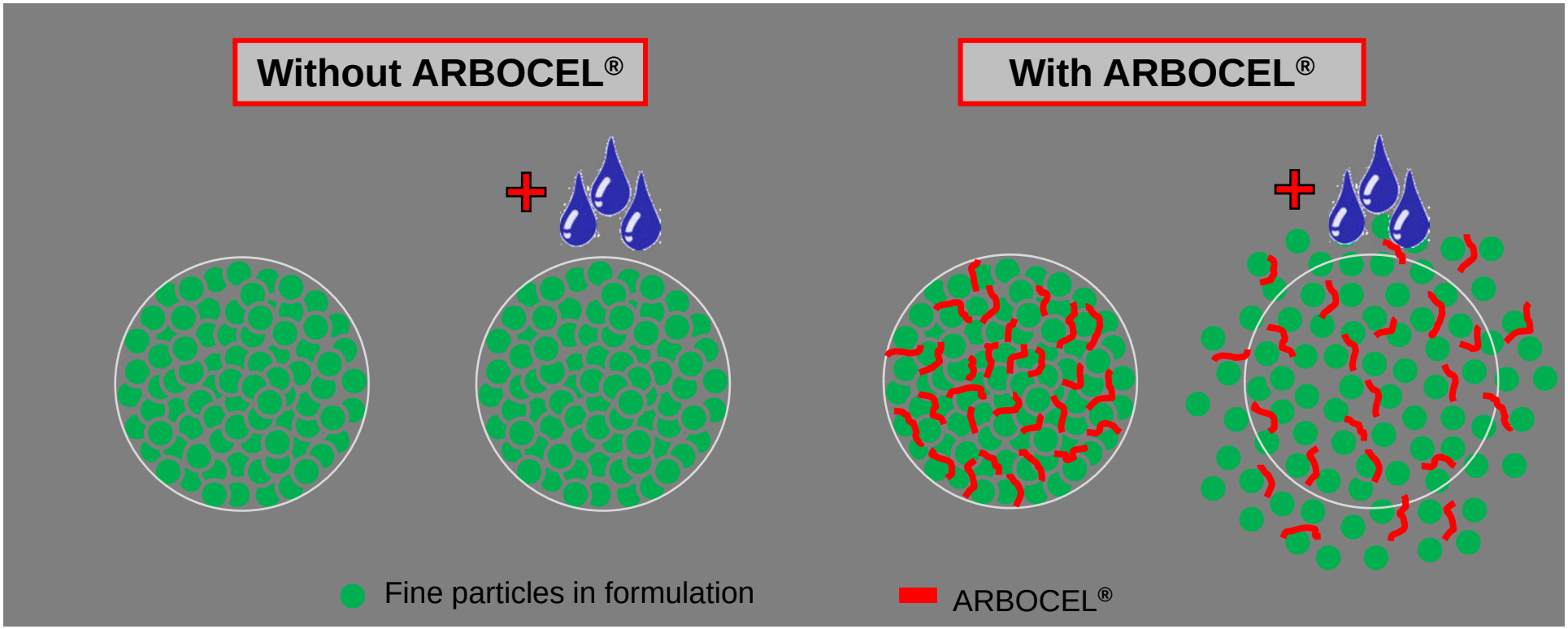
ARBOCEL® for less clustering




Any questions?

Thank you very much for your attention!

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