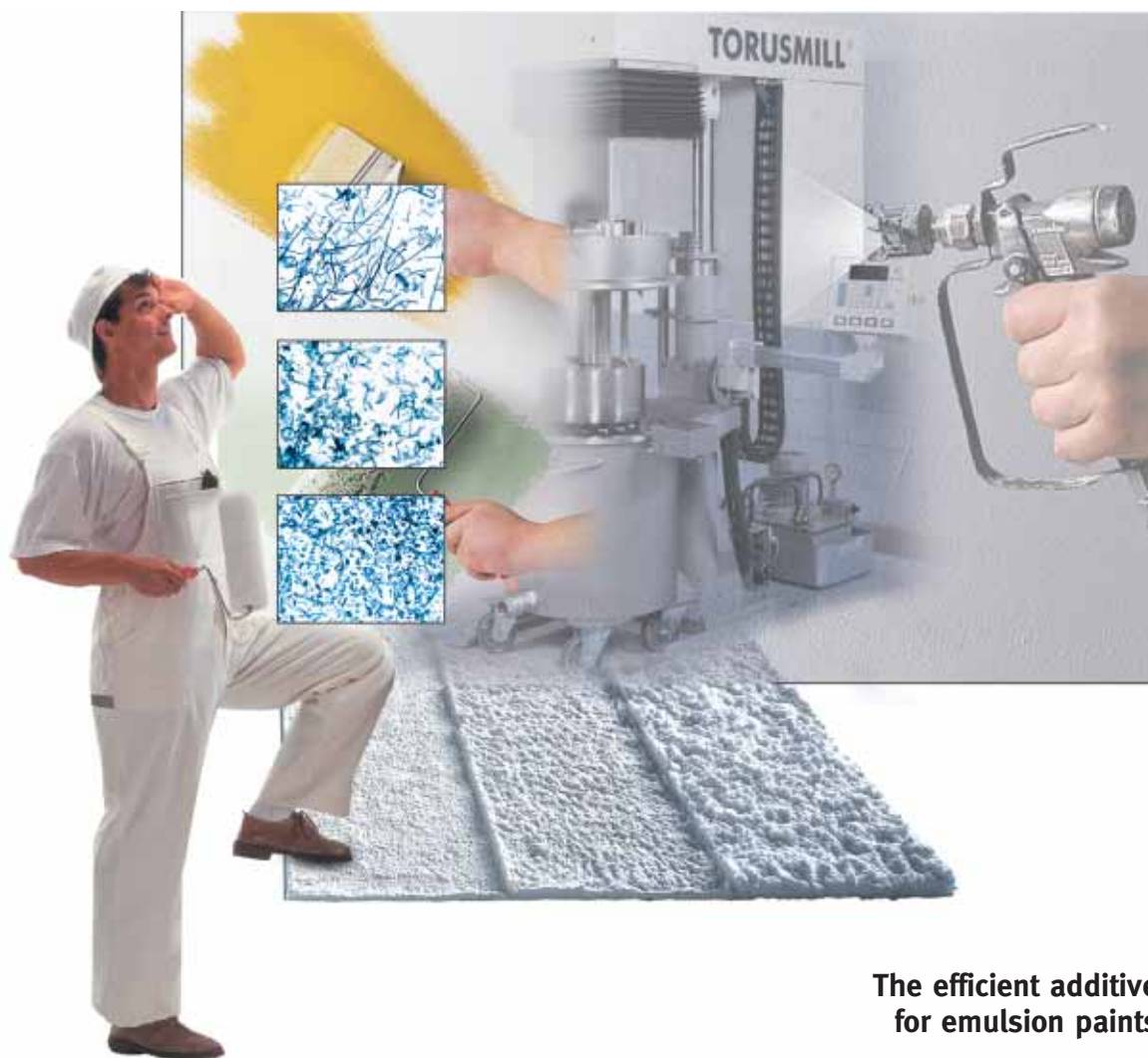


# ARBOCEL®

The efficient additive for emulsion paints  
10/2010



The efficient additive  
for emulsion paints

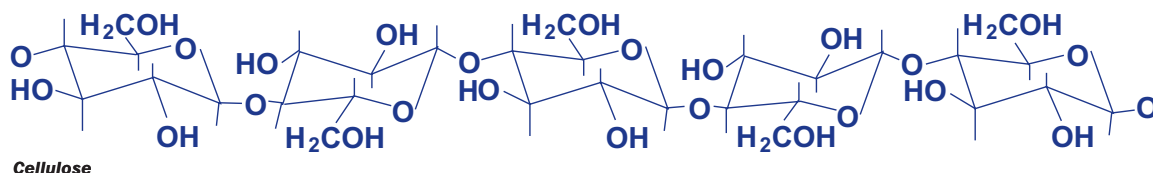
## What is ARBOCEL® ?

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**ARBOCEL®** is a powdery to fibrous cellulose additive used for products in building chemistry.

**ARBOCEL®** - additives are obtained from wood pulp. A variety of constantly renewable materials is available for the manufacture of cellulose.

**ARBOCEL®** is a natural and water insoluble cellulose (not comparable with water-soluble cellulose ethers).



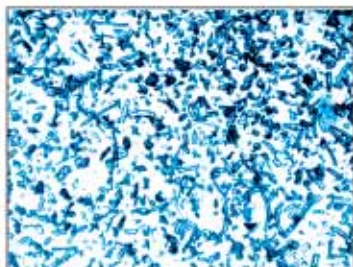
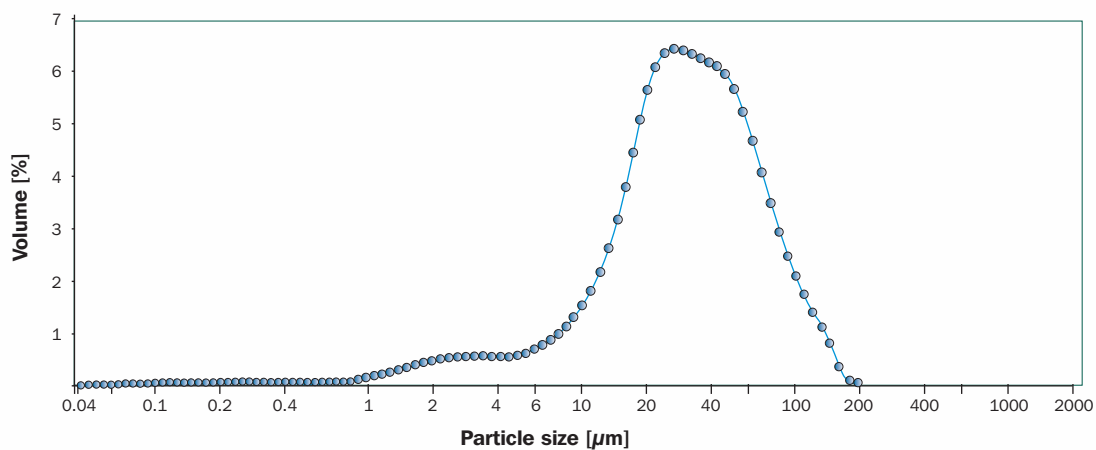
REM-picture **ARBOCEL® BE 600/30 PU**



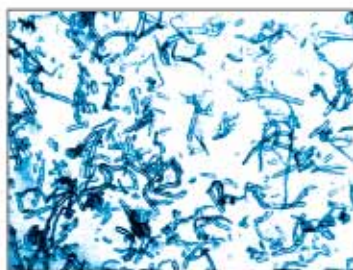
# ARBOCEL®

Natural Cellulose Fibers

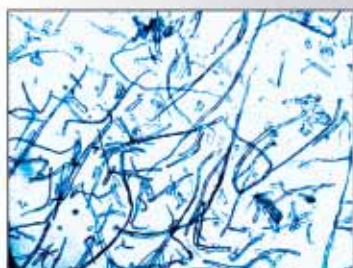
Particle Size Distribution ARBOCEL® BE 600/30 PU



ARBOCEL® BE 600/30 PU, 50x



ARBOCEL® BWW 40, 50x



ARBOCEL® BC 1000, 50x



## ARBOCEL® - the multifunctional additive

### The ARBOCEL® advantage

#### Reinforcing agent:

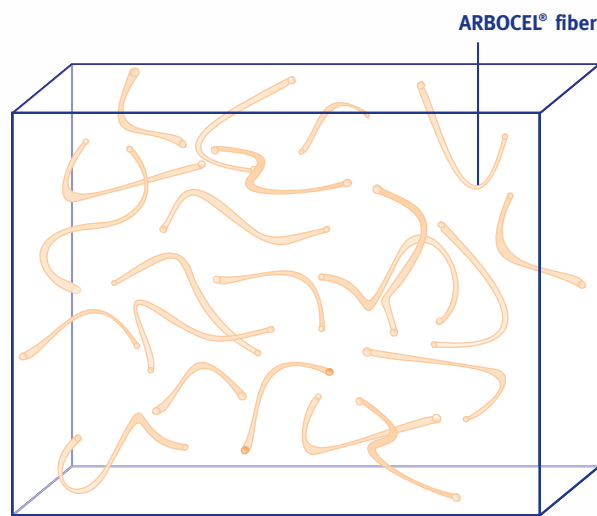
Due to the three-dimensional fiber structure, the film tension and cracking are additionally reduced. With optimum formulation the scrub resistance is increased.

As **ARBOCEL®** itself does not need a dispersion agent (due to negative charge of the surface), the percentage of the dispersion agent can be reduced.

#### Matting agent:

Micro-rough surface with sheen reduction by using **ARBOCEL®**.

Consequently, **ARBOCEL®** permits painting seamlessly. The higher the **ARBOCEL®** quantity, the stronger the matting effect.



**3-D-Fiber framework**

#### Light weight filler:

Due to the low density of **ARBOCEL®** ( $1.3 \text{ g/cm}^3$ ) and the addition of water (1 part of **ARBOCEL®** allows the additional application of 2-2.5 parts of water), it is possible to reduce the weight in the total volume of the paint.

The weight ratio of solids is reduced, however the volume ratio of solids can be maintained. In an optimized formulation, the optical properties are normally not affected.



# ARBOCEL®

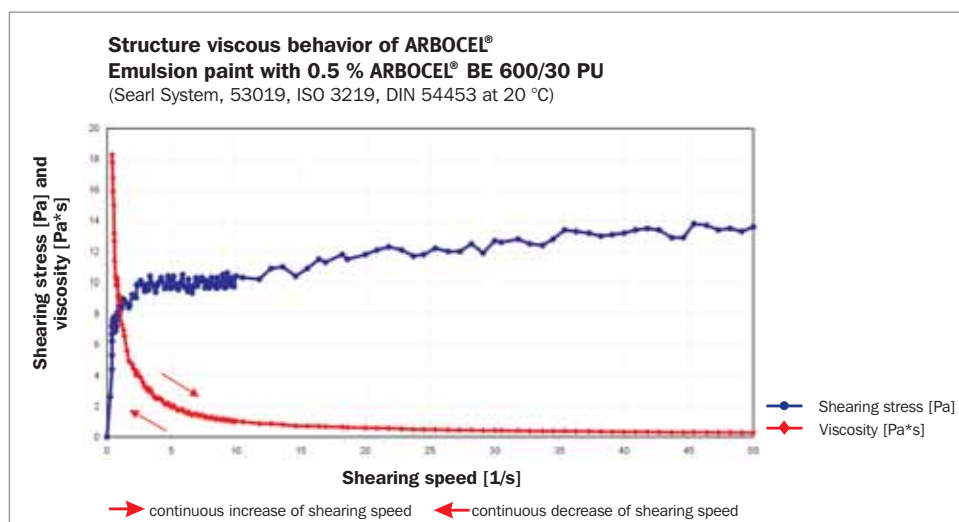
## Natural Cellulose Fibers

### Rheology agent:

Structurally viscose behavior through significant fiber structure.

In combination with cellulose derivatives like MC, HEC etc. a higher cohesive effect is obtained.

The slipping of the roller during application is considerably reduced and the spatter resistance can be improved (similar effect with an associative thickener).



### Applications and quantities

Application	Recommended ARBOCEL® quality	Recommended Ø quantity
Emulsion Paints for interior use, matt, airless-sprayable	BE 600/30 PU	1.0 - 5.0 %
Emulsion Paints for exterior use, matt, airless-sprayable	BE 600/30 PU	0.5 - 2.5 %
Emulsion-Silicate-Paints	BE 600/30 PU	0.5 - 1.0 %
Emulsion-Powder-Paints (especially full shade paint)	BE 600/30 PU	5.0 - 8.0 %
Structure Paints	BWW 40 B 00	0.5 - 3.0 %
Reinforcing Paints	BC 1000	0.5 - 3.0 %
Road Marking Paints	BC 1000	0.4 - 0.8 %



## ARBOCEL® - the multifunctional additive

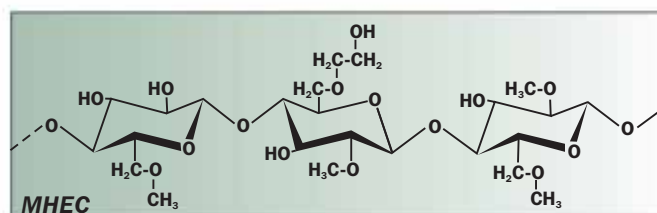
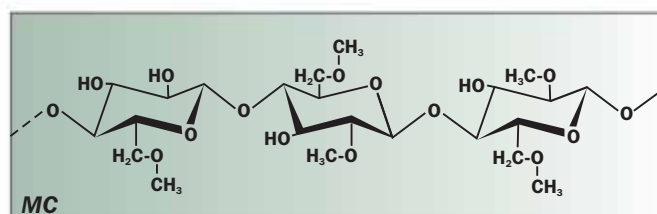
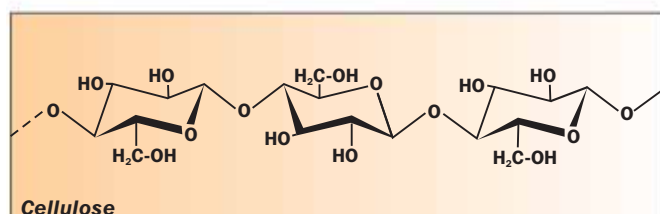
### Cellulose ether / ARBOCEL®

#### Common properties / differences

	Cellulose ether	ARBOCEL® quality
<b>Water soluble</b>	yes	no
<b>Stickiness</b>	yes	no
<b>Water retention</b> Example: Centrifugal method AACC	yes > 2000 %	yes BE 600/30 PU approx. 350 % BWW 40 approx. 580 % BC 1000 approx. 1000 %
<b>Viscosity increase</b>	yes	yes, but less compared to high viscosity cellulose ethers

#### AACC-Method (American Association of Cereal Chemists):

$$\text{Water retention [\%]} = \frac{\text{weight of wet cellulose fiber} - \text{weight of cellulose fiber}}{\text{weight of cellulose fiber}} \times 100$$



### ARBOCEL® - Product range with physical data

ARBOCEL® Quality	BE 600/30 PU	B 00	BWW 40	BC 1000
<b>Color</b>	white	white	white	white
<b>Ø Fiber length</b>	40 mm	120 mm	200 mm	700 mm
<b>Ø Bulk density (g/l)</b>	220	160	125	40

We will be glad to send more information and samples for testing purposes upon request.



## Where can ARBOCEL® be used ?

### ARBOCEL® for emulsion paints

#### ARBOCEL® for airless sprayable paints

ARBOCEL® BE 600/30 PU



#### ARBOCEL® specially for roller and brush application

ARBOCEL® B 00

ARBOCEL® BWW 40



#### ARBOCEL® reinforcing paints

ARBOCEL® BC 1000



#### Further paint applications with ARBOCEL®

- Silicate-paints
- Lime-cement paints
- Powder-paints
- Coatings with structural effects (LIGNOCEL® - grades)



## Effects of ARBOCEL® on your paint

### Formulation **A** without ARBOCEL® Re-formulation **B** with 5 % ARBOCEL®

	<b>A</b>	<b>B</b>
Water	373.0	431.2
ARBOCEL® BE 600/30 PU	--	<b>50.0</b>
Defoamer	2.0	2.0
Dispersant	0.5	0.5
Wetting Agent	2.5	1.8
Fungicide	2.0	2.0
NaOH (pH 9)	+	+
Aluminium silicate 0.035 µm	25.0	25.0
Titanium Dioxide	60.0	60.0
CNN (marble) 0.9 µm	<b>430.0</b>	<b>322.5</b>
Thickener	5.0	5.0
Film forming auxiliary material	15.0	15.0
Styrene acrylic dispersion	80.0	80.0
Urethane-based associative thickener	5.0	5.0
<b>TOTAL</b>	<b>1000.0</b>	<b>1000.0</b>
Solids weight %	56.2	50.5
Solids volume %	21.8	22.0
Density	1.50	1.38
Sheen (85°)	<b>54.1</b>	<b>9.4</b>
Brightness (HBW A)	93.6	92.7
Contrast ratio	99.8	99.6
DIN 53778* (part 2)	<b>1900</b>	<b>&gt;5000</b>

#### Note:

With this formulation the use of **ARBOCEL®** is examined with regard to its matting effect. This is the reason why a formulation with very fine calcium carbonate (CCN 0.9 µm) has been re-formulated, in order to demonstrate the efficiency of **ARBOCEL®** as a matting agent. Of course a sheen smaller than 5 can be achieved by combining **ARBOCEL®** with a balanced filler combination.

### Advantages of re-formulation with ARBOCEL®:

- Density is reduced from 1.50 to 1.38
- Reduction of sheen from 54.1 to only 9.4
- Increase of the scrub resistance from 1900 to 5000 scrub cycles
- Cracking only over 430 µm (without **ARBOCEL®** 210 µm)

#### Wet scrub resistance DIN 53778\*, part 2

**A**



Formulation without **ARBOCEL®**

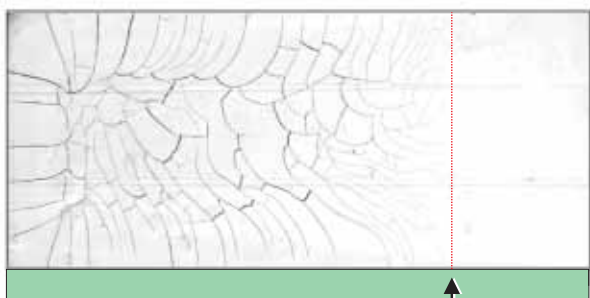
**B**



Re-formulation with 5 % **ARBOCEL®**

#### Mud cracking

**A**



2000 µm 210 µm 50 µm  
Formulation without **ARBOCEL®**

**B**



2000 µm 430 µm 50 µm  
Re-formulation with 5 % **ARBOCEL®**

\* DIN 53778 was replaced by DIN EN 13300.





# ARBOCEL®

Natural Cellulose Fibers

## Spatter resistance

**C** Trade sales formulation, **D** Formulation with 5 % ARBOCEL®

	<b>C</b>	<b>D</b>
Water		427.8
ARBOCEL® BE 600/30 PU		50.0
Defoamer		1.0
Dispersant		2.2
Wetting Agent		1.5
Fungicide		0.5
NaOH		+
Titanium Dioxide		65.0
CCN (marble) 7 µm		50.0
CCN (chalk) 2.4 µm		150.0
CCP 0.3 µm		110.0
Talc 3 µm		80.0
Thickener		2.0
Thickener		4.0
Defoamer		1.0
Binder		105.0
<b>TOTAL</b>		<b>1050.0</b>
Solids weight %	~60.0	~54.5
Solids volume %	~24.6	
Density	1.52	1.42
Sheen (85°)	3.2	3.2
Brightness (HBW A)	89.4	89.6
Contrast ratio	99.3	99.4
DIN 53778* (part 2)	~1800	~1800

## Improvement of spatter resistance

**C**



Formulation without ARBOCEL®

**D**



Re-formulation with 5 % ARBOCEL®



## Formulation of an emulsion paint - moderate in price

### Re-formulation of an emulsion paint (interior / exterior) (PVC 80 %) <sup>(1)</sup>

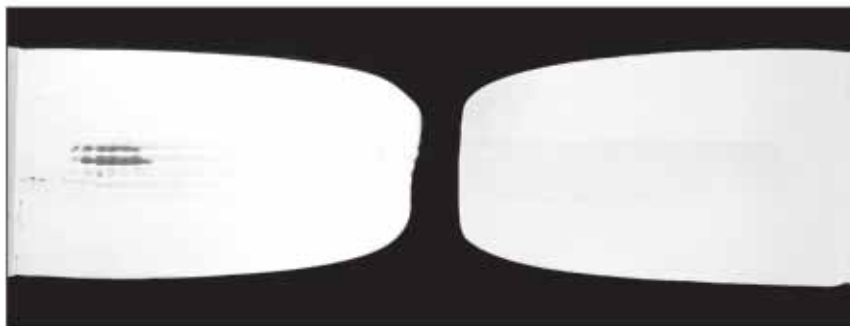
Titanium Dioxide	approx.	10 %
Fillers	approx.	35 %
ARBOCEL® BE 600/30 PU	approx.	3.5 %
Cellulose ether	approx.	0.2 %
Acrylic thickening agents	approx.	0.25 %
Styrene emulsion	approx.	10 %
Water	rest	10 %

#### Advantages of ARBOCEL® :

- Reduction of raw material costs
- Improvement of quality

and common quantity  
of additives like:  
glycol - solvents -  
dispersant - fungicides

#### Wet scrub resistance with 1000 cycles



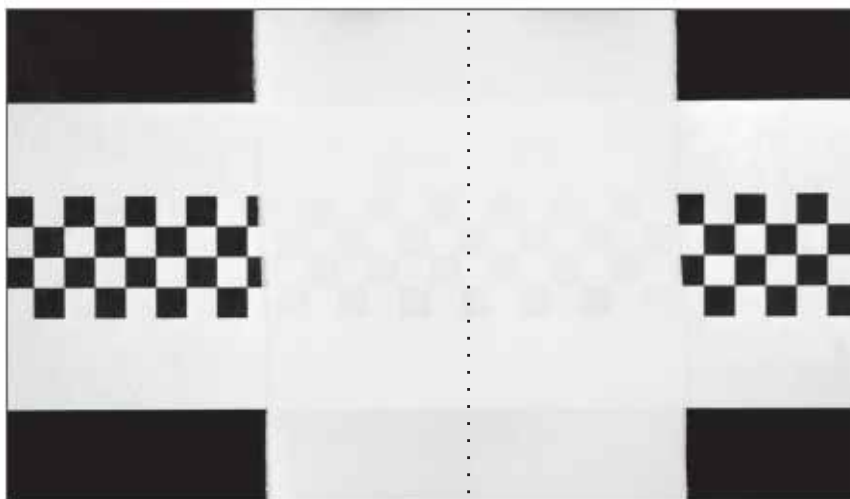
Formulation  
without **ARBOCEL®**

Re-formulation with  
approx. 3.5 % **ARBOCEL®**

#### Advantage of ARBOCEL® :

- Improvement of  
wet scrub resistance

#### Hiding power



Formulation  
without **ARBOCEL®**

Re-formulation with  
approx. 3.5 % **ARBOCEL®**

#### Advantage of ARBOCEL® :

- no negative influence on  
hiding power

<sup>(1)</sup> PVC: Pigment volume concentration



# ARBOCEL®

Natural Cellulose Fibers

## Packing information

### Packing in bags

Bags are delivered  
on pallets.



### Packing in Big Bags

Big Bags are delivered  
on pallets.



### Packing Bulk material (Silo)



## JRS - the partner for distribution, technique and service

- JRS will be happy to answer any questions about **dosage** and **transport**
- JRS does **initial trials** for you
- JRS supports you in the **reformulation**
- JRS is your contact for **product improvement** and **new developments**





## Business Unit Industry

**JRS – your strong **system partner** and **solution provider**  
for organic fibres in industrial and technical applications**

**High Quality Products with Best Benefit,  
Technology and Service Support**

**ARBOCEL®**

Natural Cellulose Fibers

**LIGNOCEL®**

Wood Fiber Materials

**SYLOTHIX®**

Polyethylene Fibers

**ARBOTHIX®**

Polyethylene Fibers

### Other JRS Products and Services:

#### Wide Range of Plant Fibers

(Fruit, Grain, Vegetable, Wood)

**Microcrystalline Cellulose** (MCC)

**Cellulose Derivates** (HPMC, MC, etc.)

**Ultrafine Celluloses** (UFC)

**Croscarmellose** (CCM)

**Sodium Starch Glycolate** (SSG)

**Composit Products**

**Contract Services**

### JRS - YOUR Qualified Partner - worldwide

- **Worldwide logistics and presence**
- **18 manufacturing locations in Europe, USA, India, Mexico**
- **High availability and efficient, high-capacity production**
- **Over 1400 employees worldwide**
- **In-house research and development, application services**
- **Over 250 technical representatives around the world**
- **Decades of experience and comprehensive application know-how**
- **Quality manufacturing according to ISO 9001**

● JRS Headquarters

● JRS Offices

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



18 production plants in Germany, Finland, Hungary, UK, USA, Mexico, India

**J. RETTENMAIER & SÖHNE**  
GMBH+CO.KG



Fibres designed  
by Nature