



**Creating value –
for the sake of the
environment**

Insulation – goes without saying! For the sake of people and the environment.

JRS – A recognized expert for state-of-the-art cellulose technology for decades

- Over 135 years of experience and technology know-how
- A globally active, owner-managed family group of companies
- Market and technology leader in the field of functional organic fibers for virtually all areas of modern industry and daily life
- Based exclusively on sustainable organic raw materials (fruit and cereal fibres and many different type of wood fibre and cellulose)
- Reliable supplies from a globally structured company with an international service and logistics network
- DIN ISO 9001:2008 certified quality management
- DIN ISO 500001 certified energy management
- Environmental handbook based on DIN ISO 14001 (environment management system)



Building insulation, naturally ...

The insulation of buildings is a key element of the 'energy revolution'. 40 % of the energy consumption of German households is used to heat homes. There is thus enormous potential to make savings in this area. Correspondingly, the objective is to reduce the energy consumption of heating systems by 20 % by 2020.

Correct insulation – which is also environment- friendly ...

Modern cellulose insulating materials help to save energy – sustainably and, above all, in the long term. This results in noticeably lower energy costs; is good for the environment and also provides greater comfort in the home thanks to additional beneficial effects! Climasafe insulation has a positive effect on the carbon footprint. Active environmental protection with multiple benefits for people, the environment and our pockets.

Functional insulating cellulose obtained from special, high quality recycling paper raw materials:

Cellulose has excellent heating insulating and storing properties and is the product of choice thanks to the fact that it settles without sinking. Insulating cellulose is flame-retardant; re-usable and demonstrates a high resistance to damp while providing consistent insulating performance.

The benefits:

- Very low energy requirements for manufacturing
- The lowest priced industrially manufactured natural insulating material
- Thermal bridge-free insulation
- Saves resources thanks to the use of recycling materials

- Cold insulation
- Heat insulation
- Noise insulation
- Reduced energy costs
- Saving of resources
- Value creation

A pleasant indoor climate all year round

Effective insulation against the cold:

A cosy, warm indoor climate can make even cold winter days pleasant.

ARBOCEL® CLIMASAFE offers amazingly efficient heat insulation and excellent protections against the cold. Cold external air cannot penetrate indoors and comprehensive insulation prevents the occurrence of thermal bridges.

Highly effective heat insulation:

In contrast to conventional, mineral-based insulating methods cellulose insulating materials offer far better heat insulation.

ARBOCEL® CLIMASAFE absorbs the flow of heat from roof and external wall surfaces, preventing interior rooms from overheating – not just on hot summer days.

Noticeable noise protection:

The excellent noise-absorbing properties of cellulose fibres provide occupants with effective protection from ambient noise. Filling cavities with **ARBOCEL® CLIMASAFE** prevents the noises and vibrations they can produce. There is no longer any noise. The result? Relaxing peace and quiet!

Reduce energy consumption:

The installation of **ARBOCEL® CLIMASAFE** insulating cellulose results in a significant improvement in a house's energy efficiency. This in turn means long term reductions in energy costs (heating, airconditioning) plus an additional saving for the owner thanks to the low installation costs.

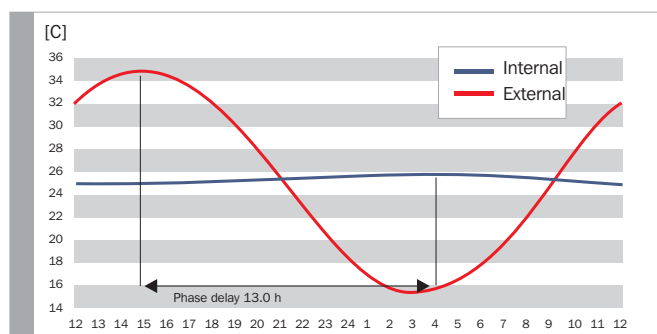
Create value:

The installation of **ARBOCEL® CLIMASAFE** insulating cellulose will not only increase the comfort of your home – this sustainable investment will also add value to your property, giving you the maximum return.



Areas of application:

- Roof, walls, ceilings and floors
- As insulation between the rafters of pitched roofs
- Loosely blown or filled into attic or ceiling spaces
- False ceiling cavities
- Exterior walls of timber-framed or timber-panelled structures
- Floor constructions
- Other cavities:
Radiator alcoves, shafts, hot water tanks
- Residential homes, industrial buildings
- Old buildings, new buildings



Surface temperature over the course of the day

[Time of day]

“Phase delay” describes a significant time delay in the minimized transfer of temperature through external walls. The corresponding day- and night-time fluctuations result in a self-regulating, constant room climate.

The right insulating material product idea

Manufacturing

Innovative **JRS HPC fibrillation** results in maximum fiber resilience.

This means that there is virtually no likelihood that **ARBOCEL® CLIMASAFE** will sink when it settles. This in turn means a noticeable saving in materials and thus reduced costs.



Installation:

- Fast, clean, simple
- Using blowing machines
- In cavities (e.g. for timber-framed structures)
- No joins, continuous without thermal bridges
- No cutting
- Uncomplicated transport inside the building using a hose

Safety tested to protect people and the environment

- No volatile substances
- Saves resources
- 100 % recycling material requires the lowest use of primary energy during manufacturing of all insulating materials (approx. 55 – 70 kWh/m³)
- Can easily be recycled when removed by skilled professionals
- No hazardous substances as per ETA-05/0186
- Contains no ammonium compounds

Safety

- No dripping in the event of a fire
- Fire-resistant thanks to added boron salt
- Pest-proofed using boron salt

Optimum protection

A special, low-dose boron salt is used to make **ARBOCEL® CLIMASAFE** fire- and pest-resistant.

Approved by the German Federal Health Office this is the environment-friendly choice within the range of available protective substances. It is odourless and non-volatile. Perfect to integrate flame- and pest-resistance into a highly functional, user-friendly product.

The boron salt is homogeneously distributed using an innovative procedure developed by JRS, during which it is optimally combined with the fibres without any losses caused by separation. This in turn means that it is possible to reduce the concentration of boron salt to an absolute minimum while still retaining maximum efficacy!

Certificates



- DIN ISO 9001:2008 certified quality management
- DIN ISO 50001 certified energy management
- Environmental handbook based on DIN ISO 14001 (environment management system)
- European Technical Approval ETA - 13/0410

Technical data, installation

Installation partners

- A network of experienced, skilled specialist companies ensure dust-free installation thanks to practical injection procedures
- Cooperation with licenced, specially trained professional partners

Recycling

Material can be recycled following extraction and separate storage.

Packaging

15 kg bales on Euro pallets



Technical data:

Name: ARBOCEL® CLIMASAFE insulating cellulose

Fire protection: Boron compounds

Fire behaviour: Class E as per DIN EN 13 501-1,
corresponds to Class B2 as per DIN 4102

Approval: ETA-13/0410 (European technical approval)

Densities as per approval:

For cavity insulation in walls	60-70 kg/m ³
For cavity insulation in pitched roofs; cavity insulation in ceilings where injected into closed cavities for the long term	40-70 kg/m ³
For cavity insulation in ceilings; exposed insulation on horizontal and slightly pitched surfaces (max. 10°)	30-70 kg/m ³

Limit value of thermal conductivity:

$\lambda_D = 0.039 \text{ W/(m x K)}$

Water vapour diffusion resistance:

Density 30 kg/m³: $\mu = 1.9$

Density 70 kg/m³: $\mu = 2.1$

Flow resistance:

Density 30 kg/m³: 2 kPa s/m²

Water absorption:

Density 30 kg/m³: 9.6 kg/m²

Density 70 kg/m³: 44.9 kg/m²

Mould resistance:

No breeding grounds for fungal growth, Level 0 as per EN ISO 846

JRS – a global company:

**Functional quality products
with optimum benefits -
designed by Nature**

JRS – Your competent system and technology partner worldwide

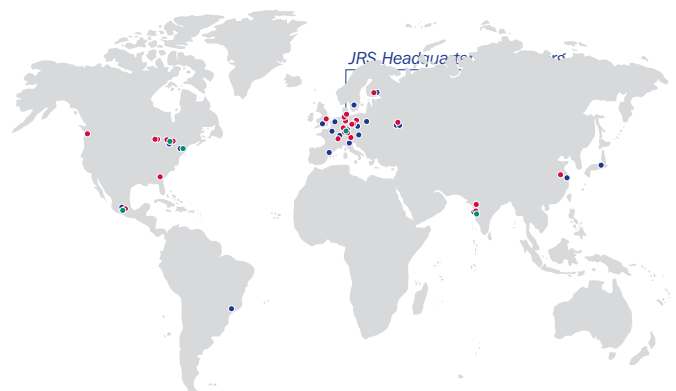


JRS in-house development centre with application labs

- Over 135 years experience in the use and processing of organic fibers
- Comprehensive technical know-how in application and processing
- Functional special products for a diverse range of applications, e.g. the food and pharmaceuticals industries; building; modern materials
- The highest quality standards
- Global deliveries, consultancy, logistics and service
- Global presence with JRS-owned sales organisations and over 200 competent specialist agents
- 25 production sites in Germany, Finland, UK, India, Mexico and USA
- Over 2000 highly skilled employees worldwide in the JRS group
- Innovation partner with in-house research and development laboratories and continuous application optimisation
- ISO 9001 certified quality management
- Natural raw materials, environment-friendly production



JRS headquarters, Rosenberg-Holzmühle site, Germany



● **25 Production Sites:**
Germany, Finland, UK, USA,
Mexico, India, Russia, China

● **7 R+D and Application
Technology Centers:**
Europe, America, Asia

● **23 JRS Sales Companies:**
Austria, Benelux, China, Czech
Republic, Finland, France, Italy,
India, Japan, Latin America,
Mexico, Poland, Russia, Spain,
Sweden, Switzerland, UK, USA

www.jrsclimasafe.com

J. RETTENMAIER & SÖHNE
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**Fibers designed
by Nature**

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