



Siempelkamp

Maschinen- und Anlagenbau



WOOD-FIBER INSULATION BOARD

> Siempelkamp dry process

> WOOD-FIBER INSULATION BOARD

Wood-Fiber Insulation Boards are one of the first industrially made insulation products. Despite serious competition from mineral fiber and plastic foam products today they gain market share in Germany

Why using Wood-Fiber Insulation Board:

- **Wood is a sustainable raw material**
Its processing is not very energy intensive.
It's ecologically sound.
- **It increases living comfort**
The thermal capacity of wood is much higher than that of mineral fiber or plastic foam, hence Wood-Fiber Insulation Boards protect much better against summer heat.
- **It supports uniform interior climate**
The thermal conductivity of Wood-Fiber Insulation Boards is not much affected by moisture which enables diffusion-open wall designs. Picked-up moisture will be released over time without problems.
- **It fits into the system**
For buildings based on wooden constructions a Wood-Fiber Insulation Board 'fits into the system'.

A convincing concept for the production of Wood-Fiber Insulation Boards

The raw material for the production of insulation boards are wood chips. They are fiberized in a conventional steam refiner and dried in a flash dryer.

In difference to the traditional wet-manufacturing process the revolutionary Dry Process with a new bonding system has been developed. After the fibers are dried, they are blended with a special, fast curing Isocyanate resin. To apply this resin a new method of spraying the fibers inside a tower was researched in depth, developed, and tested by the Siempelkamp Research and Development Department.

Also new: after pre-pressing, the mat enters a calibration and curing step using Siempelkamp's unique pre-heating unit ContiTherm. Here the mat is heated rapidly by blowing a steam-air mixture through it.

For the new concept, the ContiTherm was equipped with an extended calibration zone. The modified system allows for heating and curing even thickest mats of up to 300 mm. Finally, the endless board is cut by a diagonal saw to the required length.

Siempelkamp is pleased that their efforts of developing new technologies and machines have led to a break-through which now allows the production of wood-fiber insulation boards using a continuous dry-manufacturing process.



ContiTherm



Resin application

> PROCESS

Siempelkamp developed a new process and doing so extended the properties of the Wood Fiber Insulation Board.

The **Dry Process** developed by Siempelkamp uses proven process technology in many manufacturing steps:

- efficient drying of wood fibers in a flash dryer
- utilizing a highly reactive PMDI-resin for rapid curing
- application of the resin in a special 'Dry Blowline'
- mechanical mat-forming with dry fiber
- fast heating of the mat according to the Siempelkamp ContiTherm-principle
- cross-cutting of the endless, cured board by a diagonal saw
- cut-to-size online and to demand

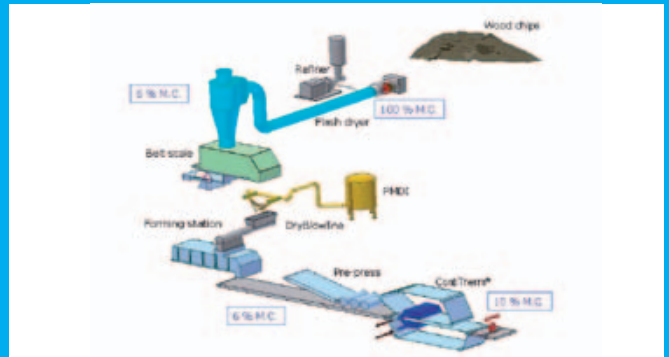
With the **Dry Process** essential advantages are achieved:

- board density can be as low as 80 kg/m³ (5 lbs./cu.ft.)
- thickness is up to 300 mm (9 in.) – homogeneous in one layer
- no water treatment is necessary
- energy costs are low

Optionally, flexible boards may be produced on the same production line, after addition of some equipment, with:

- bonding by bi-component fibers (BICO)
- board density as low as 40 kg/m³

New Siempelkamp Dry Process



> PRODUCTION PLANT DATA

Raw material

Wood (without bark)

Binder

Hydrophobic additive (for special applications)

Fire retardant (depending on density)

softwood (like spruce, fir, pine)

PMDI (for rigidboards)

Option: Bico-fibers (for flexible boards)

paraffin emulsion

ammoniumphosphate

Site

(for the production line without warehouse, infrastructure etc.)

Masterboard width

approx 6,500 m² (70,000 sq. ft.)

approx 150 m x 42 m (500 ft. x 140 ft.)

approx. 2,400 to 2,600 mm (8.0 – 8.5 ft.), depending on final board size

Rigid board – Capacity

(depending on density and thickness)

Throughput

36 – 72 m³/h (1,270 – 2,540 cu. ft./hour)

up to 7 t/h (7.7 ton/hour) wood

Option: flexible board – Capacity

(depending on density and thickness)

Throughput

45 – 75 m³/h (1,585 – 2,648 cu. ft./hour)

up to 3 t/h (3.3 ton/hour) wood

> APPLICATION



Wood-Fiber Insulation Boards are being utilized for thermal and sound insulation in **roofs – walls – floors**. They protect against cold during winter and – most importantly – against heat in the summer.

roofing:

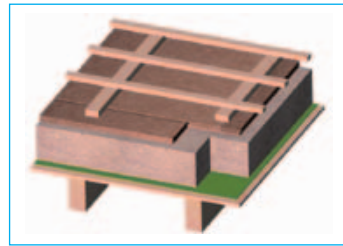
- Insulation on top of rafters (sufficiently compression resistant to carry the load of the cladding, e.g. roofing tiles)
- Insulation under the rafters (formwork) for additional insulation if the rafter height is not sufficient
- Insulation between the rafters (e.g. in the pre-fabricated housing industry)

walls:

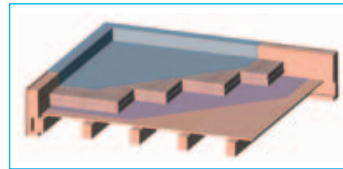
- Insulation of exterior and interior walls (against heat and sound transmission)
- Substrate for EIFS (Exterior Insulating and Finishing Systems) Interior insulation for renovation works

flooring:

- Compression-resistant insulation for floating screeds
- Insulation against impact noise (e.g. under laminate flooring or parquet)



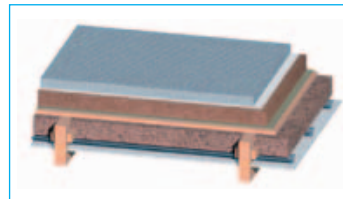
Insulation on top of rafters



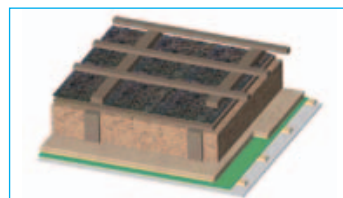
flat roof insulation



Exterior Insulation and Finishing System (EIFS)



Floating floor screed on Wood-Fiber Insulation Board



Option: flexible board insulation between rafters

Wood-Fiber Insulation Board according to the Siempelkamp Dry Process

Property/rigid boards			Density [kg/m ³] / [lbs./cu.ft.]		
			110/6.9	140/8.7	200/12.5
Compression	EN 826	kPa	appr. 20	appr. 70	appr. 200
		p.s.i.	appr. 2.9	appr. 10.1	appr. 29.0
Thermal Conductivity nominal value	EN 13171	W/m*K	appr. 0.037	appr. 0.040	appr. 0.045
Fire behaviour ^{a)}	EN 13501		Class E		

a) with fire retardant (depending on density)



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