



# fiberEX

Extruder concept for processing Wood Plastic Composites

battenfeld-cincinnati 



## Your partner for successful WPC production

The fiberEX extruder series was designed especially for the production of wood plastic composites. With an output window of 15 – 1,000 kg/h the series exactly meets the requirements of the WPC\* industry. Based on its longterm expertise battenfeld-cincinnati offers solutions to process a wide variety of raw material combinations. Maximized flexibility in material choices is ensured by a modular extruder for direct extrusion as well as a two-step production process.

At battenfeld-cincinnati a team of dedicated specialists makes continuous developments possible. Together with its worldwide unique network of competent partners specialized in raw materials, formulation development, tooling, as well as feeding and dosing solutions, battenfeld-cincinnati is able to give the best possible support to start-up and successfully run a WPC extrusion business.

### Our features:

- ✓ fiberEX extruder series with screw diameters from 38 to 135 mm for outputs from 15 to 1,000 kg/h
- ✓ Machine concept especially engineered for WPC processing
- ✓ Diverse screw geometries for processing WPC based on a variety of different raw materials
- ✓ Modular dosing, feeding solutions for all materials even for bulk materials showing poor flow behavior
- ✓ Optimized degassing solutions for maximizing the achievable processing window

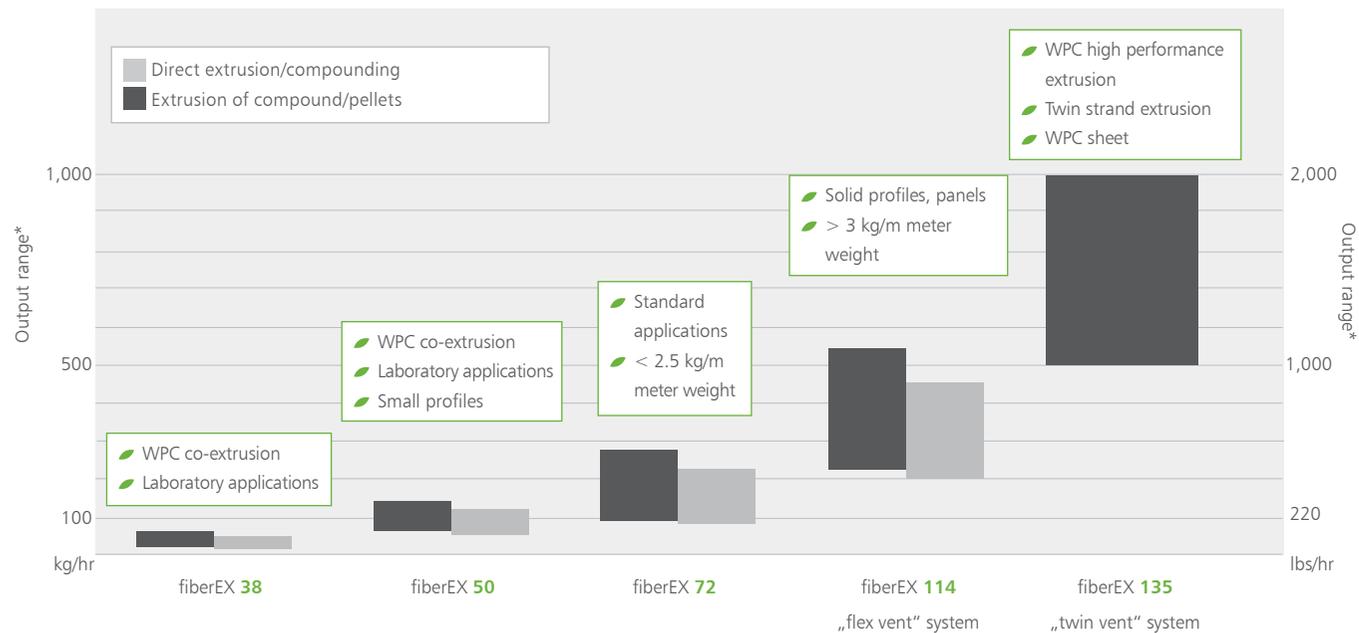
### Your benefits:

- ✓ Expertise gathered by more than 250 lines placed worldwide
- ✓ Modular machine concept for direct extrusion as well as extrusion in two-step process
- ✓ Partnership with the leading system suppliers in the market along the whole supply chain

\* The established market term „wood plastic composites“ (WPC) here refers to natural fiber plastic composites in general.

## fiberEX output range

The extensive output range of battenfeld-cincinnati's WPC extruder series



| Output range* kg/h |             |
|--------------------|-------------|
| fiberEX 38         | 15 - 60     |
| fiberEX 50         | 50 - 140    |
| fiberEX 72         | 80 - 275    |
| fiberEX 114        | 200 - 550   |
| fiberEX 135        | 500 - 1,000 |

\* Actual achievable output depends on residual moisture content, formulation, wood content, polymer types, wood type, tooling and downstream

## Technical specifications

### Machine sizes

The fiberEX extruder series consists of three conical (38, 50, 72) and two parallel counter-rotating extruders (114, 135). With output windows from 15 up to 1,000 kg/h, customers can choose the most flexible and efficient solution for their application based on the latest technical developments.

### Screw geometries

Achieving optimal melt quality is the ultimate goal of extrusion. Heat and shear sensitive materials such as WPC make this task even more challenging. The fiberEX screw geometries, especially made for WPC, were designed from scratch based on the vast experience of 250 lines in the field and more than a decade of experience in natural fibre extrusion accumulated by battenfeld-cincinnati. Thanks to continuous developments according to inputs from customers, partners and raw material suppliers, battenfeld-cincinnati can offer the most flexible extrusion solutions for processing a wide variety of WPC formulations.



### Barrel temperature control

Homogeneous melt temperature due to even barrel temperatures is ensured by battenfeld-cincinnati's maintenance-free air power cooling system apc®. In addition, all fiberEX extruders are equipped with maintenance-free screw core thermoregulation systems that ensure efficient heat transfer between the output and the plastification section in order to provide optimal melt quality.

### Drive

All fiberEX extruders come with maintenance-free and energy efficient AC drives as standard.

### Machine design

In designing extruders battenfeld-cincinnati's engineers aim to provide optimized equipment performance and highest possible process stability. Above that easy handling, low maintenance levels as well as smallest possible footprints are realized.

## Direct extrusion

Direct extrusion allows the direct processing of all components in a WPC formulation within one processing step. Besides patented technology (Pat. No: DE 103 16 232) to feed materials in a direct mode, we have developed an integrated system that allows direct processing of up to 6 different components on counter-rotating machines. Whether direct extrusion can be used or not depends on the quality of the raw materials, the formulation and its dispersion throughout the process, as well as the end product's properties and the performance required.

## Degassing

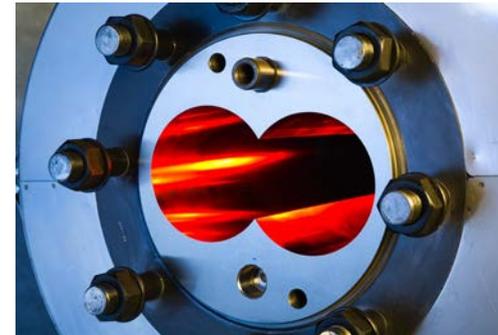
The removal of residual moisture is often referred to as one of the most important and critical steps in WPC extrusion. Depending on the extruder's capacity, executions with single, extended or twin-vent systems are available. Different degassing aggregates enable a focussed maximization of venting performance, thereby optimizing end product quality.

## Wear protection

Due to the abrasive and corrosive nature of WPC formulations, the choice of wear protection is an important criteria for the processing unit's lifetime. WPC requires individually adjusted wear protection. Our fiberEX series, with its diverse metallurgical solutions, offers a variety of possibilities to lengthen the lifetime of the processing unit.

## Compounding on fiberEX

The fiberEX extruder series can be modified with a few steps for the compounding of WPC compound. The focus is on formulations with wood content  $\geq 35\%$ . The fiberEX extruder with direct extrusion arrangement can be combined, according to the requirements, with a hot die face granulator, an under-water granulator or a water ring pelletizer. Which technology is used depends on the output rates needed and the polymer type and content. Formulations with up to 75 % fiber content can be extruded.



## Applications

**With 75 % the main applications for WPC are for outdoor use:**

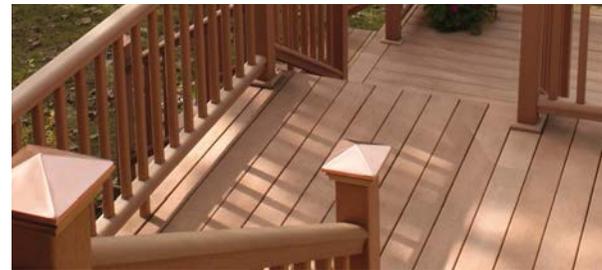
No splintering, no painting, longer lifetime. These are the reasons in the WPC outdoor market for replacing conventional wood products with WPC.

### Outdoor applications

- ✓ Decking
- ✓ Railing
- ✓ Siding
- ✓ Fencing
- ✓ Noise barrier wall
- ✓ Sight screen panels

### Formulations (all applications)

40-75 % wood or natural fibres (rice husks, sisal, cork, bagasse), PE, PP, PVC, anorganical fillers, additives ( $\text{CaCO}_3$ ,  $\text{TiO}_2$ , talcum)



### Applications for indoor use:

Design, function and material properties drive this market segment. Today door frames, skirtings and furniture products are the first profiles where traditional materials are substituted. Alternative products in this segment are mainly MDF products; however, WPC offer decisive benefits compared to MDF, particularly in warm and humid climates.

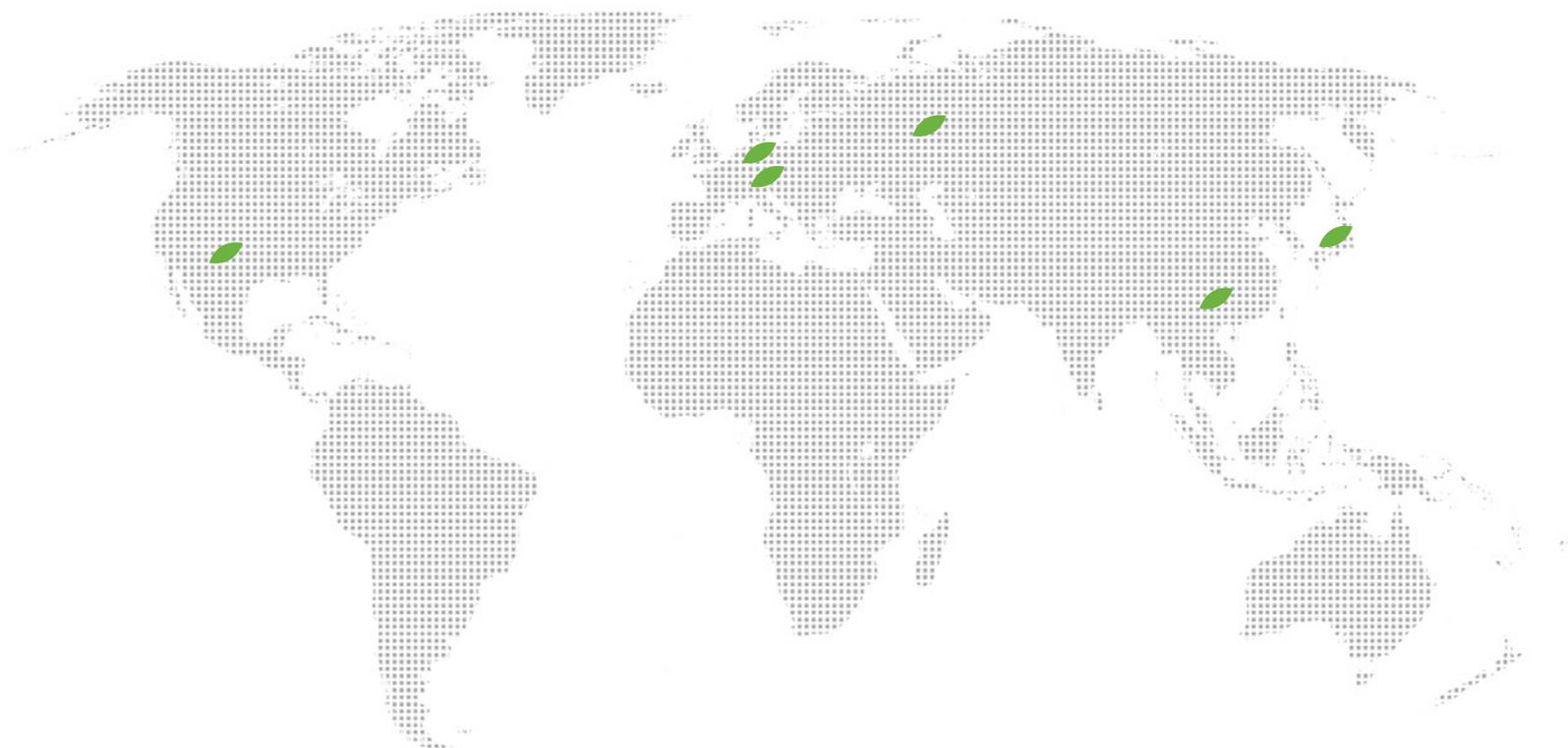
### Indoor applications

- ✓ Doors and doorframes
- ✓ Window sills
- ✓ Furniture
- ✓ Skirting

### Surface treatment (all applications)

- ✓ Polishing
- ✓ Brushing
- ✓ Embossing
- ✓ Co-extrusion incl. WPC-Coex





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