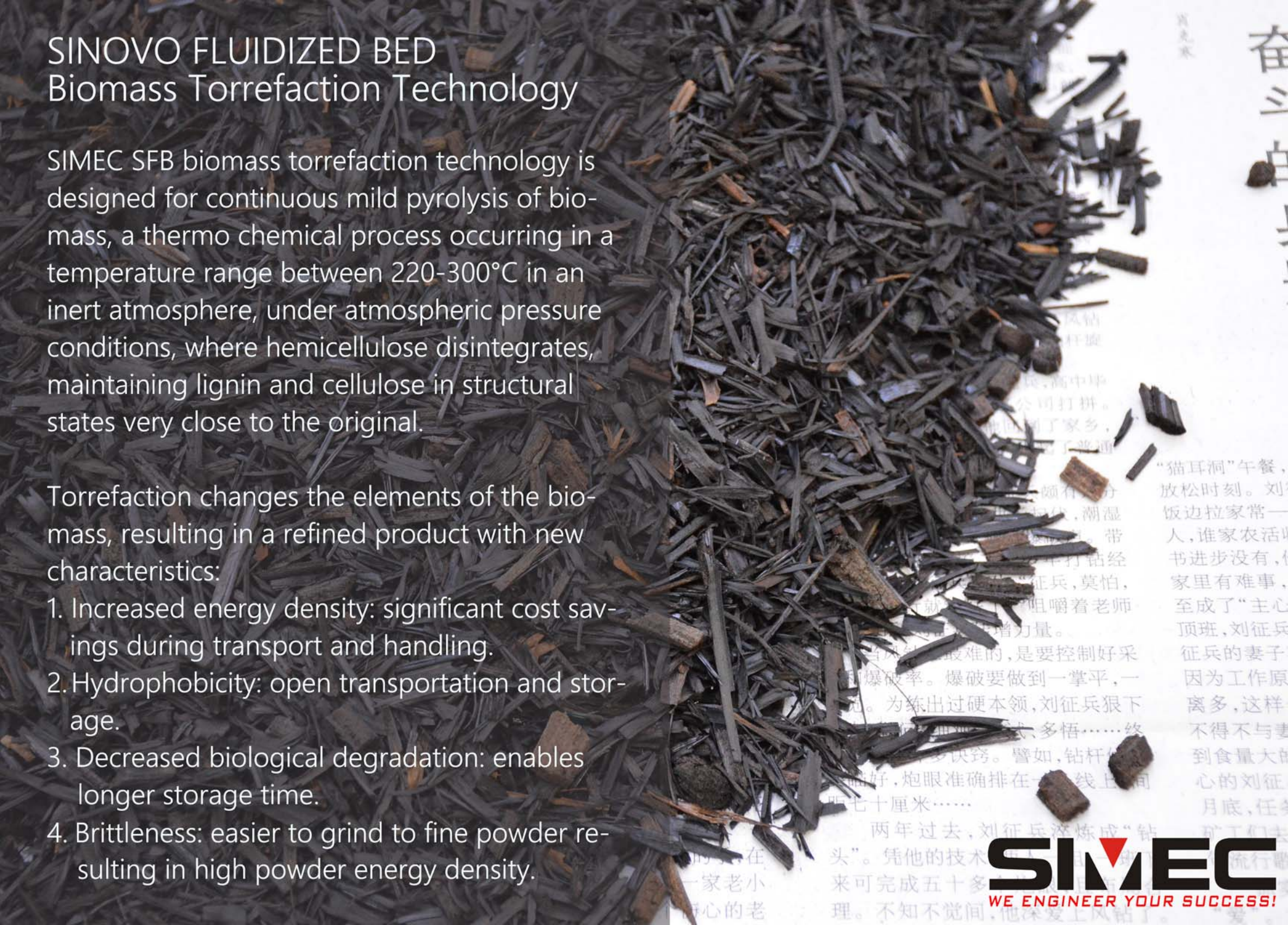
SINOVO FLUIDIZED BED
Biomass Torrefaction Technology

SIMEC SFB biomass torrefaction technology is designed for continuous mild pyrolysis of biomass, a thermo chemical process occurring in a temperature range between 220-300°C in an inert atmosphere, under atmospheric pressure conditions, where hemicellulose disintegrates, maintaining lignin and cellulose in structural states very close to the original.

Torrefaction changes the elements of the biomass, resulting in a refined product with new characteristics:

1. Increased energy density: significant cost savings during transport and handling.
2. Hydrophobicity: open transportation and storage.
3. Decreased biological degradation: enables longer storage time.
4. Brittleness: easier to grind to fine powder resulting in high powder energy density.



SIMEC
WE ENGINEER YOUR SUCCESS!

SIMEC
WE ENGINEER YOUR SUCCESS!

Biomass Torrefaction Technology

Torrefied biomass can be used for co-firing with coal, in CHP plants and for industrial applications such as steel and cement production. Torrefied biomass is also better than non-pretreated biomass for production of synthesis gas in gasification processes.

SIMEC torrefaction technology benefits industrial production of advanced solid biomass fuel. It provides a sustainable, green renewable energy source utilizing biomass and reducing carbon emissions.

Complete biomass torrefaction system consists of Sinovo Fluidized Bed reactor, an integrated pre-drying system, a biomass receiving & sorting system, a biomass feeding & distribution system, a hot gas distribution system, a heating system, a cooling system and an Artificial Intelligence (AI) powered process control system with internet access.

SIMEC
WE ENGINEER YOUR SUCCESS!

1. SIMEC advanced SFB reactor offers the clearest and most economical solution for industrial scale torrefaction process, where an energy balance is established in both the cooling loop and heating loop by using innovative recirculating gas flows.
2. SFB biomass torrefaction reactor is designed for year round non-stop production in large scale, achieving homogeneity of torrefaction for each particle produced as well as the homogeneity among the total production.
3. Homogenized torrefaction of biomass, precise control of thermal conversion process. The optimal temperature curve is maintained during endothermal and exothermal reactions of the feedstock introduced.
4. After initial start up, torrefaction reactor can work continuously without external heat source.
5. Torrefaction temperature, residence time and heating rate can be adjusted to fulfill different process requirements, to allow for a homogenous end product quality.
6. Advanced heat penetration technology, maximized thermal conversion efficiency.
7. AI integrated automatic process control with real time monitoring system, torrefaction degree can be regulated according to pre-set production data.

Technical features

1. Acceptable feedstocks: a variety of woody biomass, nut shells, agricultural herbaceous biomass such as straw, miscanthus, switch grass, corn stover, etc.
2. Mass conversion rate: 70-85%, from 15% moisture raw biomass to torrefied biomass. Torrefied biomass can be pelletized without additional binder.
3. Torrefaction temperature: 220-300°C adjustable.
4. Residence time: 15 to 25 minutes adjustable.
5. Capacities: 0.2 tons/hour, 2 tons/hour, 5 tons/hour, 10 tons/hour of torrefied biomass.
   Yield figures are based on using G30 wood chips with a moisture content of less than 15%.
6. Installed power: 20 kW to 150 kW subject to design of SFB biomass torrefaction reactor.
7. Equipment footprint: 80-800 square meters, 3.5-20 meters above the ground.

For more information, please contact SIMEC.
Email: info@simecpellet.com
Technical specifications are subject to change without notice in the future.

Technical parameters

SIMEC
WE ENGINEER YOUR SUCCESS!

SFB biomass torrefaction reactor