



CENER

CENTRO NACIONAL DE
ENERGÍAS RENOVABLES
NATIONAL RENEWABLE
ENERGY CENTRE



BIOMASS ENERGY

LIGNOCELLULOSIC BIOMASS PRETREATMENT SERVICES

Pre-treatment refers to a number of technologies which physically alter biomass structure to either change the amount of hemicellulose, cellulose and lignin or which alter its physical characteristics to increase the efficiency of biomass breakdown and further enzymatic treatments.

There is not 'one-size-fits-all' technology. Pre-treatment technologies are usually bespoke to each production plant and feedstock type.

CENER has been working on optimization of the Pretreatment stage on a wide range of Biomass Feedstocks developing Diluted Acid Hydrolysis (DAH), Hydrothermal and Liquid Hot Water (LHW) pretreatment.

CENER offers tailor made contracts on biomass pretreatment development and optimization on wide range of biomass feedstocks for different applications (biofuels and bio-based products).

LAB SCALE



2 pressurized stirred Reactors volume from 50 up to 100 ml).



1 reactor with an interchangeable vessel with a working volume from 2 up to 4 liters.

Conditions:

- **Catalyst:** acid, alkalis
- **Temperatures:** from room-temperature up to 250°C
- **Pressure:** from atmospheric up to 30-60 bar
- **Solid to liquid ratio** → 10% w/w

PILOT PLANT



Continuous horizontal reactor

- **High flexibility in feedstocks:** lignocellulosic feedstocks such herbaceous and woody, considering as well the OFMSW
- **Particle size:** from 4 up to 12 mm
- **Feed flow:** up to 5 kg/h (dry matter)
- **Temperature:** up to 200°C
- **Pressure:** from 2 bars up to 14,5 bars
- **Catalyst:** acid, alkalis
- **Residence time:** 5 - 15 min
- **Direct steam injection in the reactor**
- **Processes developed:** Liquid hot water // Diluted acid hydrolysis // Hydrothermal

Complementary services

- Full equipped laboratory for product characterization.
- Energy and Material balances for feasibility studies.
- High solid content processes development.
- Enzymatic hydrolysis and fermentation.

CONTACT

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