COMBUSTIBLE GASES FROM WASTE: PRODUCTION, CONVERSION, SUPPLY

Become a Self-Supplier

Does your company produce waste and do you want to recover this waste efficiently to supply energy? We can make combustible gases out of your waste, convert the combustible gases to have the grade required, and supply them to recover energy in the form of heat, cooling and power.

Supplying Green Power and Heat Efficiently

Since the percentage of energy produced from waste will grow in the future, we will develop gasifiers and reformers with you, which recover energy from your waste. Gasification systems that supply motors and turbines are the key to efficiency, dependability and environmental compatibility in a local heat and power supply system.

Keywords
- Biowaste
- Industrial waste
- Thermochemical conversion
- Pollutant gases and tar
- Catalytic gas conversion
- Adsorptive gas treatment
- Gas use in motors
- Power and heat supply

Sectors
- Agriculture and forestry
- Food and feed
- Textiles and apparel
- Wood, wicker and cork products
- Paper
- Rubber and plastics
- Automotive
- Waste disposal
- Utilities

Fraunhofer Institute for Factory Operation and Automation IFF

Prof. Michael Schenk
Sandtorstrasse 22
39106 Magdeburg
Germany

Contact
Process and Plant Engineering
Dr. Matthias Gohla
Phone +49 391 4090-361
Fax +49 391 4090-93-361
matthias.gohla@iff.fraunhofer.de

www.iff.fraunhofer.de/en/pat
From Waste to a Plant Design

Individual fuel tests
- Study of your fuel’s potential (quantity, quality, footprint)
- Fuel analysis based on current standards ultimate, proximate and heating value analyses, transport and storage properties

Gasification tests including scale-up
- Gasification tests with different gasification agents: air, steam, flue gas, oxygen, mixtures

Gas purification tests for your recovery technology
- Pollutant gas and tar analysis
- Tests of catalytic and adsorptive gas purification
- Ash analysis of the propensity to slag and countermeasures such as additives and evaluation of recovery options such as use as fertilizer

Development of custom gasifiers and reformers
- Planning and designing of the gasifier and reformer on the basis of your waste

Recovery of your waste
- Material and energy footprinting for your waste
- Research support from the idea through the finished unit

Infrastructure for Excellent Research

Fluidized bed gasifiers
- Laboratory, testing and pilot units with thermal outputs of between 5kW and 1MW

Gas treatment systems
- Small and big fixed and moving granular bed reactors

Gas supply systems
- Gas mixing section with permanent gases, calibration gas supply, steam boiler, real gas supply through connected equipment

Mobile gas measurement systems
- Fuel and flue gas analysis (including moisture) by GC, FTIR and TCD and oxygen probes

Mobile tar measurement systems
- Gravimetric tar and dust measurements employing the “tar guideline” and the Fraunhofer IFF’s methods, tar extraction, GC tar analysis, tar measurements using laser-induced fluorescence

Fuel conditioning
- Drying, milling, pelletizing

Fuel and ash analysis systems
- Laboratory facilities of our own and collaboration with fuel laboratories and academic institutions
- Ash tests of pure and blended fuels, ash fusion point analyses using heating microscopes

Our References

Units
- Stationary fluidized bed gasifier with 5 kW, 15kW, 100 kW and 1 MW

Model projects
- “ProBio”: Development of a gasifier including a gas treatment system
- “Biobrennstoffdesign”: Testing of straw, energy plants, wood waste and mixed fuels

Some tested fuels
- Distillers dried grains from beer brewing and pomace from wine making
- Dried solubles from bioethanol production
- Feed waste
- Straw, chaff, husks
- Landscaping material
- Meat and bone meal
- Digestate from biogas plants
- Chicken excrement
- Sludge
- Textile interior trim of vehicles
- Rejets from paper recycling
- Waste from rotor blade manufacture
- Waste from metal coating

Images: 1 Carsten Keichel, 2 Torsten Birth, 3, 4, 5 Dirk Mahler