

# Optimising the combustion process

And reducing the emission values

## ■ The design of a new combustion system

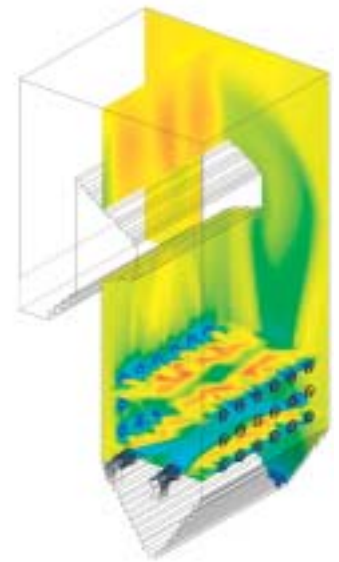
“Do we meet the efficiency levels that we hoped for while still meeting the legal emission standards?” This question is crucial both when constructing a new plant and when retrofitting an existing one. We may be able to find the answer from a computer model on which we can test a plant’s operation before finalising its design. In this way we can also study the impact of various types of fuel. We can then alter the design to meet the optimum parameters. Modelling of this type requires an in-depth knowledge of combustion processes and CFD (Computational Fluid Dynamics). This expertise is available at Laborelec.

## ■ Meeting stricter standards

As the emission standards are becoming more stringent, this causes problems for many fossil fuel combustion plants. Nevertheless, there are often a number of low-budget solutions available. By measuring and analysing the present emission values, and deriving a few simple measures from the results, we can often bring emissions below the standard values. If there is no obvious solution available, a simulation may point us in the right direction. In this way our Laborelec experts can bring your emissions below the standard values in the most efficient way possible.

## ■ Use of substitute fuels

It also takes considerable know-how to set up a combustion plant for a certain type of fuel. This type of adjustment is needed, for example, when switching to a new fuel or adding a substitute fuel. These new fuels often have a detrimental effect on how the combustion chamber works and can lead to excessive waste products, the formation of nitrous oxides, corrosion or unburned particles. We conduct a preliminary study to map out these influences and recommend appropriate steps. This helps to maintain an efficient plant operation.



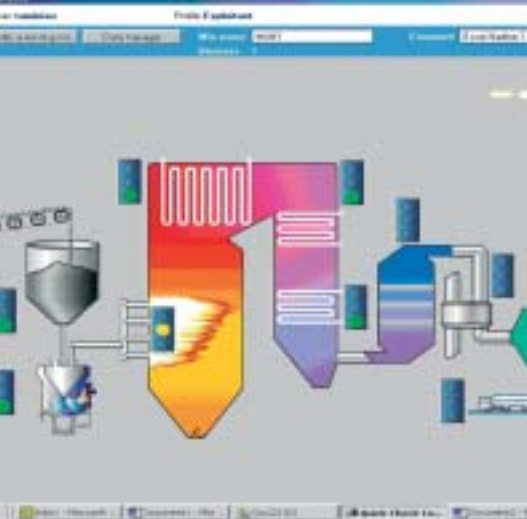
## A specialised service

### ■ We can help you to optimise combustion in:

- Utility power plants (fossil fuel)
- Steam and gas, and combined heat and power stations
- Engines
- Incinerators



The technical Competence Center  
in energy processes and energy use.  
**From innovation to operational assistance.**



We will gladly help you find the best combustion process from a technical, economic and ecological point of view.

■ **In cooperation with the operating and maintenance personnel we will define the system requirements and then take the necessary action. For example:**

- Installing and calibrating equipment to measure the flue gases
- Measuring and analysing combustion air, fuels, flue gases and residual products to define the combustion and emission parameters
- Giving recommendations on the use of biomass, waste and other fuel alternatives
- Technical, economic and ecological optimisation of the combustion process
- Carrying out a design study of new and retrofitted incinerators

During these steps our experts will work with your personnel as closely as possible to ensure that everything runs smoothly. They will also ensure that any outage of your production processes is kept to a minimum.

■ **All necessary equipment**

We have a broad range of measuring equipment at our disposal :

- Probes of various types and lengths for
  - ◆ gas samples
  - ◆ speeds and temperatures
  - ◆ heat fluxes
  - ◆ dust and particles
  - ◆ dew point measurements
- a multi-point sampling system
- various gas conditioning systems
- analysers for O<sub>2</sub>, CO<sub>2</sub>, CO, NO<sub>x</sub>, SO<sub>2</sub>, and dust

■ **Efficient gas turbine regulation**

Laborelec can regulate a gas turbine to make it much more efficient after maintenance or overhaul. This type of 'mapping' is highly sensitive: the oxygen supply should not be too low to prevent the formation of HC and CO, or too high to restrict the percentage of NO<sub>x</sub>. We have a mobile measuring unit at our disposal, which we can quickly install when re-starting the turbine. It consists of a measuring probe for NO<sub>x</sub>, CO, HC and O<sub>2</sub>, connected to a PC that processes the measurement data and presents the results in graphic form. These graphs are remotely signalled to the power station control center, and can be used to regulate the gas turbine immediately.



**Five reasons for you to choose Laborelec:**

- you have one-stop shopping for your energy needs;
- you get access to more than 40 years of experience;
- you get rapid service with reliable solutions;
- you increase the profitability of your installations;
- you benefit from independent and confidential advice.

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