BREF: EASY IS NOW POSSIBLE
SICK SUPPORTS COMPLYING WITH THE NEW BREF REGULATIONS
LARGE COMBUSTION PLANTS: BREF REGULATIONS

BREF REGULATIONS

Emissions may differ considerably depending on the type of industrial activity. For each type of industrial activity, there is a document that represents an overview of the Best Available Techniques – called the Best Available Techniques Reference Document, or BREF. Currently, 32 BREFs exist, covering all kinds of industrial processes.

The aim of the EU policy on LCPs is to reduce emissions to air, water and land – including measures related to waste – in order to achieve a high level of protection of the environment as a whole. Legislation exists both on the national level and the EU level to prevent or, as much as possible, to limit emissions of harmful substances into air, water, and soil. The emission levels that are permitted are those consistent with Best Available Techniques, or BATs.

BATs are designed to achieve a high level of protection of the environment and are both economically and technically feasible and accessible to the operator.

LCPs vary significantly in size: Large LCPs are defined with a thermal input between 301 and 500 MWth; very large LCPs with a thermal input greater than 500 MWth.

LCPs use large amounts of fuels to produce useful forms of energy. The range of fuels stretches from solid fuels to gaseous fuels. The focus for LCPs is to reduce their emissions of acid gas pollutants, particulate matter and ozone precursors from LCPs.

Fuels are for example:
- Solids: Coal, lignite, biomass, peat.
- Liquids: HFO (heavy fuel oil), gas oil in boilers and engines, gas oil in gas turbines.
- Gaseous: Natural gas and process gas from iron and steel plants and chemical industry.
- Co-incineration of waste with solid fuels.

Once a BREF has been updated and its BAT conclusions adopted, permitting authorities in the Member States have a period of four years in which they must review and, if necessary, update their permits to ensure that the new Emission Limit Values (ELVs), based on the new BAT conclusions, will be met.

For LCPs this means the implementation will need to be completed by July 2021 at the latest.
### NEW COMPONENT TO BE MONITORED

<table>
<thead>
<tr>
<th>Plant size</th>
<th>Fuel type</th>
<th>New plants (mg/Nm³)</th>
<th>Existing plants (mg/Nm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yearly average and average over the sampling period</td>
<td></td>
</tr>
<tr>
<td>&lt; 300 MW – once every three months</td>
<td>COAL</td>
<td>&lt; 1 - 3</td>
<td>&lt; 1 - 9</td>
</tr>
<tr>
<td>&gt; 300 MW – continuous</td>
<td></td>
<td>&lt; 1 - 2</td>
<td>&lt; 1 - 4</td>
</tr>
<tr>
<td>&lt; 300 MW – once every three months</td>
<td>LIGNITE</td>
<td>&lt; 1 - 5</td>
<td>&lt; 1 - 10</td>
</tr>
<tr>
<td>&gt; 300 MW – continuous</td>
<td></td>
<td>&lt; 1 - 4</td>
<td>&lt; 1 - 7</td>
</tr>
</tbody>
</table>

**NEW:** HG is one of the components obligatory to measure.

**NEW COMPONENT TO BE MONITORED**

**TIGHTER EMISSION LIMITS TO BE OBSERVED**

<table>
<thead>
<tr>
<th>Type of combustion plant</th>
<th>Total rated thermal input (MWth)</th>
<th>BAT-AELs (mg/Nm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yearly average</td>
<td>Daily average or average over the sampling period</td>
</tr>
</tbody>
</table>

**NOₓ**

- **Open-cycle gas turbines (OCGTs)**
  - New OCGT
  - Existing OCGT (excl. turbines for mechanical drive applications) – except for plants operated < 500 h/yr
    - ≥ 50
    - 15 – 35
    - 25 – 50
  - ≥ 50
    - 15 – 50
    - 25 – 55

- **Combined-cycle gas turbines (CCGTs)**
  - New CCGT
  - Existing CCGT with a net total fuel utilisation < 75 %
    - 50 – 600
    - 10 – 45
    - 15 – 40
  - Existing CCGT with a net total fuel utilisation of ≥ 75 %
    - 50 – 600
    - 25 – 50
    - 35 – 55
  - Existing CCGT with a net total fuel utilisation of < 75 %
    - ≥ 600
    - 10 – 40
    - 18 – 50
  - Existing CCGT with a net total fuel utilisation of ≥ 75 %
    - ≥ 600
    - 10 – 50
    - 18 – 55

- **Gas turbine put into operation no later than November 27, 2003, or existing gas turbines for emergency use and operated < 500 h/yr**
  - ≥ 50
  - No BAT-AEL
  - 60 – 140

- **Existing gas turbine for mechanical drive applications – except for plants operated < 500 h/yr**
  - ≥ 50
  - 15 – 50
  - 25 – 55
The new BREF regulations 2017 for large combustion plants are more than complex. In order to assist users for a better understanding of the complex application basics, SICK has developed a corresponding data-based tool, checked and approved by TÜV Germany. To be on the safe side and to implement the new rules and regulations correctly, please ask our sales team for support. We would be happy to provide you with professional advice through using our BREF Selector. Please call your SICK sales person for an appointment.
The following aspects must be observed and considered when updating your plant to be compliant with the new BREF regulations:

- Thermal input in MW
- Type of fuel
- Start of plant operation
- Operation time per year
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASK</td>
<td>Annular shaft kiln</td>
</tr>
<tr>
<td>BAT</td>
<td>Best available technique</td>
</tr>
<tr>
<td>BAT-AEEL</td>
<td>Best available techniques - associated energy efficiency levels</td>
</tr>
<tr>
<td>BAT-AEL</td>
<td>Best available techniques - associated emission levels</td>
</tr>
<tr>
<td>BREF</td>
<td>Best available techniques reference (document)</td>
</tr>
<tr>
<td>CCGT</td>
<td>Combined-cycle gas turbine</td>
</tr>
<tr>
<td>COG</td>
<td>Coke oven gas</td>
</tr>
<tr>
<td>DLN</td>
<td>Dry low-NOx burners</td>
</tr>
<tr>
<td>ESP</td>
<td>Electrostatic precipitator</td>
</tr>
<tr>
<td>FGD</td>
<td>Flue-gas desulphurization</td>
</tr>
<tr>
<td>GT</td>
<td>Gas turbine</td>
</tr>
<tr>
<td>IGCC</td>
<td>Integrated gasification combined cycle</td>
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<tr>
<td>LCP</td>
<td>Large combustion plant</td>
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<tr>
<td>LRK</td>
<td>Long rotary kiln</td>
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<tr>
<td>MFSK</td>
<td>Mixed feed shaft kiln</td>
</tr>
<tr>
<td>OSK</td>
<td>Other shaft kiln</td>
</tr>
<tr>
<td>PFRK</td>
<td>Parallel flow regenerative kiln</td>
</tr>
<tr>
<td>PRK</td>
<td>Rotary kiln with preheater</td>
</tr>
<tr>
<td>SCR</td>
<td>Selective catalytic reduction</td>
</tr>
<tr>
<td>SNCR</td>
<td>Selective non-catalytic reduction</td>
</tr>
</tbody>
</table>

SICK’s analyzer components and solutions provide forward-thinking concepts for measuring tasks in the fields of emission and process measurement technology. Typical fields of application include emission and process measurements in power plants, waste incineration plants, cement plants, and the chemical industry.

One example is the MERCEM300Z extractive mercury gas analyzer, which monitors Hg emissions in flue gases with high reliability, down to the smallest measuring ranges. Our range of dust concentration monitors fulfills the requirements of the new BREF.
Challenges in the power industry

The power industry faces a number of challenges when generating electricity. In every plant, the efficient use of fuel and protection of assets are of utmost importance to ensure optimum profitability. Emission monitoring and pollution control are requirements in nearly every country.

SICK is an ideal partner for the power industry. With our broad range of intelligent sensors and solutions, which have proven their applicability in all areas of the power generation process, from material flow, to pollution control, to emissions monitoring – all from a single source.

Emissions monitoring

The regulatory requirements for emission monitoring and reporting are becoming more stringent in nearly every country in the world. In order to ensure compliance, many customers turn to SICK to meet their needs for monitoring solutions for dust, volume flow, and continuous gas emissions.
SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 8,800 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what customers need. In application centers in Europe, Asia, and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes SICK a reliable supplier and development partner.

Comprehensive services round out the offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

That is “Sensor Intelligence.”

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → www.sick.com