



BREF: EASY IS NOW POSSIBLE

SICK SUPPORTS COMPLYING WITH
THE NEW BREF REGULATIONS

SICK
Sensor Intelligence.

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.



NEW EU ENVIRONMENTAL STANDARDS
FOR LARGE COMBUSTION PLANTS
BY THE EUROPEAN COMMISSION

BREF REQUIREMENTS

1

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.

LARGE COMBUSTION

2

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.

TIMELINE

3

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.

COAL AND
LIGNITE

4

NEW COMPONENT TO BE MONITORED

	Plant size Example new component	Fuel type	New plants (mg/Nm ³)		Existing plants (mg/Nm ³)	
			Yearly average and average over the sampling period			
NEW: HG is one of the components obligatory to measure	HG	COAL	< 1 - 3		< 1 - 9	
			< 1 - 2		< 1 - 4	
	HG	LIGNITE	< 1 - 5		< 1 - 10	
			< 1 - 4		< 1 - 7	

NATURAL GAS

5

TIGHTER EMISSION LIMITS TO BE OBSERVED

	Type of combustion plant Example from range of new components	Total rated thermal input (MW _{th})	BAT-AELs (mg/Nm ³)	
			Yearly average	Daily average or average over the sampling period
NO _x	Open-cycle gas turbines (OCGTs)			
	<ul style="list-style-type: none"> New OCGT Existing OCGT (excl. turbines for mechanical drive applications) – except for plants operated < 500 h/yr 	<ul style="list-style-type: none"> ≥ 50 ≥ 50 	<ul style="list-style-type: none"> 15 - 35 15 - 50 	<ul style="list-style-type: none"> 25 - 50 25 - 55
NO _x	Combined-cycle gas turbines (CCGTs)			
	<ul style="list-style-type: none"> New CCGT 	≥ 50	10 - 30	15 - 40
	<ul style="list-style-type: none"> Existing CCGT with a net total fuel utilisation < 75 % 	50 - 600	10 - 45	35 - 55
	<ul style="list-style-type: none"> Existing CCGT with a net total fuel utilisation of ≥ 75 % 	50 - 600	25 - 50	35 - 55
	<ul style="list-style-type: none"> Existing CCGT with a net total fuel utilisation of < 75 % Existing CCGT with a net total fuel utilisation of ≥ 75 % 	<ul style="list-style-type: none"> ≥ 600 ≥ 600 	<ul style="list-style-type: none"> 10 - 40 10 - 50 	<ul style="list-style-type: none"> 18 - 50 18 - 55
NO _x	Open- and combined-cycle gas turbines			
	<ul style="list-style-type: none"> Gas turbine put into operation no later than November 27, 2003, or existing gas turbines for emergency use and operated < 500 h/yr Existing gas turbine for mechanical drive applications – except for plants operated < 500 h/yr 	<ul style="list-style-type: none"> ≥ 50 ≥ 50 	<ul style="list-style-type: none"> No BAT-AEL 15 - 50 	<ul style="list-style-type: none"> 60 - 140 25 - 55

Guideline values in the field of analytical measuring technology

Type of Industry	Power - LCP 2017	1	Your
Plant type	Solid Fuels	1	
Type of Installation	existing	1	
Average type	Yearly	1	
Process type	Coal	1	
Combustion MW(th)	> 100	1	

Process_Type	Component	Limit	Operating_hours	Operating_date	Average
Coal	SO2	95-200 mg/Nm ³	---	---	Yearly
Coal	Nox	100-180 mg/Nm ³	---	---	Yearly
Coal	DUST	2-14 mg/Nm ³	> 1500 h/yr	---	Yearly
Coal	HCl	20 mg/Nm ³	---	---	Yearly
Coal	HCl	1-7 mg/Nm ³ FGD	---	---	Yearly
Coal	HF	< 1-3 mg/Nm ³	---	---	Yearly
Coal	HF	1-7 mg/Nm ³	---	---	Yearly
Coal	Hg	< 1-9 mg/Nm ³	---	---	Yearly
Coal	HCl	20 mg/Nm ³	< 500 h/yr	---	Yearly
Coal	HCl	20 mg/Nm ³ FBC	---	---	Yearly
Coal	HCl	1-5 mg/Nm ³	---	---	Yearly

SICK BREF SELECTOR

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 im-

plement 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.

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Remark

These BAT-AELs do not apply to plants operated < 1500 h/yr.

For plants combusting fuels where the average chlorine content is 1000 mg/kg (dry) or higher, the higher end of the BAT-AEL range is 20 mg/Nm³ in the case of plants fitted with wet FGD with a downstream gas-gas heater.

The higher end of the BAT-AEL range is 7 mg/Nm³ in the following cases: plants fitted with wet FGD with a downstream gas-gas heater. The lower end of the BAT-AEL range can be achieved with specific mercury abatement techniques.

For plants operated < 500 h/yr, these levels are indicative.

For FBC boilers, the higher end of the BAT-AEL range is 20 mg/Nm³.

The lower end of these BAT-AEL ranges may be difficult to achieve in the case of plants fitted with wet FGD and a downstream gas-gas heater.

checked and
approved by
TÜV Germany

SELECTION
CRITERIA

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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

BREF
GLOSSARY
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ASK	Annular shaft kiln
BAT	Best available technique
BAT-AEEL	Best available techniques - associated energy efficiency levels
BAT-AEL	Best available techniques - associated emission levels
BREF	Best available techniques reference (document)
CCGT	Combined-cycle gas turbine
COG	Coke oven gas
DLN	Dry low-NOx burners
ESP	Electrostatic precipitator
FGD	Flue-gas desulphurization
GT	Gas turbine
IGCC	Integrated gasification combined cycle
LCP	Large combustion plant
LRK	Long rotary kiln
MFSK	Mixed feed shaft kiln
OSK	Other shaft kiln
PFRK	Parallel flow regenerative kiln
PRK	Rotary kiln with preheater
SCR	Selective catalytic reduction
SNCR	Selective non-catalytic reduction

SICK
PRODUCTS
9

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