European Commission

Best Available Techniques (BAT) Reference Document for the Production of Cement, Lime and Magnesium Oxide (CLM BREF)

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BAT Reference Document for the production of Cement

- ***One of a series*** ***of sectoral BAT Reference Documents (33 + 2 BREFs) elaborated by the EIPPCB***
- ***CL BREF*** ***originally*** **adopted in** **December 2001**
- ***First BAT Reference Document to be revised*** ***(under IPPC) – CLM BREF including Lime and MgO***
- ***Revision finalised under*** ***the Industrial Emission Directive 2010/75/EU (IED)***

Sevilla process

IPPC approach and related legislation

Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control

Directive 2008/1/EC of 15 January 2008 Codified version

CLM BREF revised under IPPC - BATC transformed under IED

Directive 2010/75/EU of 24 November 2010 On industrial emissions (integrated pollution prevention and control) (Recast)

IED Industrial Emissions Directive

The European Industrial Emissions Directive (IED)

- ***Driving forces of the Industrial Emissions Directive 2010/75/EU:***
  - Give priority to intervention at source, e.g. efficiency of processes, management improvement
  - Implement the Best Available Techniques (BAT)
  - Assure compliance, enforcement and environmental improvements
  - Provide a level playing field in the European Union by aligning environmental performance requirements for industrial installations

The instrument for determining Best Available Techniques

- ***Article 13(1) of Industrial Emissions Directive 2010/75/EC:***
  - "In order to draw up, review and, where necessary, update **BAT reference documents**, the Commission shall organise an **exchange of information** between Member States, the industries concerned, non-governmental organisations promoting environmental protection and the Commission"

- ***The exchange of information should address:***
  - the **performance** of installations and techniques **in terms of emissions and consumptions**
  - the **techniques** applied, associated **monitoring**, **technical and economic viability**

BAT Reference Documents (BREFs)

Sector-specific documents identifying Best Available Techniques (BREFs)

35 BREFs

BAT Conclusions with associated emission (and consumption) levels (BAT-AELs)

Emission Limit Values (ELVs) and/or other permit conditions for industrial installations

BAT Reference documents publicly available

Large Combustion Plants	BREF (07.2006)		MR (10.2011)	
Large Volume Inorganic Chemicals – Ammonia, Acids and Fertilisers Industries	BREF (08.2007)			
Large Volume Inorganic Chem… Others Industry				
Large Volume Organic Chemic…				
Management of Tailings and Waste-rock in Mining Activities	BREF (01.2009)			
Manufacture of Glass	BATC (03.2012) BREF (03.2012)			
Manufacture of Organic Fine Chemicals	BREF (08.2006)			
Non-ferrous Metals Industries	BREF (12.2001)	D3 (02.2013)	MR (09.2007)	
Production of Chlor-alkali	BREF (12.2001)	D1 (12.2011)	MR (09.2009)	
Production of Polymers	BREF (08.2007)			
Production of Speciality Inorganic Chemicals	BREF (08.2007)			
Pulp and Paper Industry	BREF (12.2001)	D2 is currently unavailable due to data confidentiality concerns	MR (11.2006)	
Refining of Mineral Oil and Gas	BREF (02.2003)	D2 (03.2012)	MR (09.2008)	

http://eippcb.jrc.es/reference/

Actors in the information exchange on BAT

EU Member States Committee (IED Article 75)

Members of the Committee
- Vote the BAT conclusions

'Forum' (IED Article 13)
Industry, Member States, Env. NGOs, Commission

Forum members
- Guidance to COM
- Nominate experts in TWGs
- Give formal opinion on BREFs

European IPPC Bureau (EIPPCB)

GLS
(Glass)
- Industry
- Member States
- Env. NGOs
- Commission

I&S
(Iron and Steel)
- Industry
- Member States
- Env. NGOs
- Commission

REF
(Refineries)
- Industry
- Member States
- Env. NGOs
- Commission

BREF authors
- Lead TWGs
- Validate/check information
- Draft BREFs
- Present BREF to Forum

TWG members
- Research information
- Peer review draft BREFs

35 Technical Working Groups (TWGs)

Main steps of the CLM BREF review process

Step	Date
Reactivation of the TWG (117 Members)	January-June 2005
Kick-off meeting	September 2005
Information and data collection (deadline)	June 2006
Release of two Drafts	Sept. 2007- May 2008
Final TWG meeting (under IPPC)	September 2008
Adoption (under IPPC)	May 2010
New Industrial Emissions Directive	December 2010
Transformation BAT conclusions	February 2012
TWG meeting on the BATC (under IED)	May 2012
Opinion of the Art. 13 Forum	September 2012
Vote of the Art. 75 Committee	November 2012
Publication of BAT conclusions on EU OJ	**April 2013**

BAT conclusions for the production of Cement

- ***Activities covered (IED - 3.1 Annex I):***
  - *Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other kilns with a production capacity exceeding 50 tonnes per day*
- ***Activities not covered:***
  - *Shaft kilns for cement kiln production*

Definition of BAT in the IED

Best — Most effective in achieving a **high general level** of protection of the environment **as a whole**

Available — Developed on a scale which allows implementation in the relevant industrial sector, under **economically and technically viable conditions**

Techniques — **Both** the technology used and the way in which the installation is **designed, built, maintained, operated and decommissioned**

Guidelines for the BAT conclusions

- ***Actions involved:***
  - ***Evaluate performance*** *of candidate BAT*
  - ***Establish Best Available Techniques*** *(BAT) for the sector*
  - *Where possible,* ***define BAT-associated Emission Levels (BAT-AELs)*** *or other BAT-associated Environmental Performance Levels (BAT-AEPLs)*

IED - Definition of BAT conclusions

- ***"BAT conclusions means:***

  A document containing the parts of BAT reference document laying down the conclusions on best available techniques, their description, information to assess their applicability, the emission levels associated with the best available techniques, associated monitoring, associated consumption levels and, where appropriate, site remediation measures."

Transformation of the CLM BAT conclusions under IED

- *Formulation of the BAT conclusions in line with IED requirements and based on the Commission Decision 2012/119/EU, without altering the technical content of the conclusions as presented in the adopted CLM BREF (2010)*

- *BAT conclusion: standalone document, containing the necessary information but without references to other BREF sections*

BATC translated in all EU languages

Individual BAT formulation

- ***The environmental objective of the BAT is given***
  - In order to minimise the emissions of metals from the flue-gases of the kiln firing processes, BAT is to use on or a combination of the following techniques…..
- ***In general, a list of techniques (BAT) is given; however:***
  - The list is neither prescriptive nor exhaustive
  - Other techniques may be used that ensure at least an equivalent level of environmental protection

BAT conclusions for Hg emissions from cement kilns

- ***Prevention measures:***
  - *BAT on careful selection of raw materials*
  - *BAT on the use of waste as fuel or raw material*
  - *Analysis of any waste for: constant quality, physical and chemical criteria*
- ***Control and monitoring of emissions***
  - *Periodic monitoring of metal emissions, including Hg*
  - *Continuous monitoring of dust emissions*
  - *BAT and BAT-AELs for metal emissions*

BAT conclusions for metal emissions

28. In order to minimise the emissions of metals from the flue-gases of the kiln firing processes, BAT is to use one or a combination of the following techniques:

	Technique
a	Selecting materials with a low content of relevant metals and limiting the content of relevant metals in materials, especially mercury
b	Using a quality assurance system to guarantee the characteristics of the waste materials used
c	Using effective dust removal techniques as set out in BAT 17

BAT-AELs for mercury emissions

Table 4.5: BAT-associated emission levels for metals from the flue-gases of kiln firing processes

Metals	Unit	BAT-AEL (average over the sampling period, spot measurements, for at least half an hour)
Hg	**mg/Nm^3**	**<0.05 ([2])**
∑ (Cd, Tl)	mg/Nm^3	<0.05 ([1])
∑ (As, Sb, Pb, Cr, Co, Cu, Mn, Ni, V)	mg/Nm^3	<0.5 ([1])

([1]) Low levels have been reported based on the quality of the raw materials and the fuels.

([2]) Low levels have been reported based on the quality of the raw materials and the fuels. Values higher than 0.03 mg/Nm^3 have to be further investigated. Values close to 0.05 mg/Nm^3 require consideration of additional techniques (e.g. lowering of the flue-gas temperature, activated carbon).

At 10 % O_2

BAT conclusions for dust emissions from kilns

17. In order to reduce dust emissions from flue-gases of kiln firing processes, BAT is to use dry flue-gas cleaning with a filter.

Technique ([1])	Applicability
a. Electrostatic precipitators (ESPs)	Applicable to all kiln systems
b. Fabric filters	
c. Hybrid filters	
([1]) A description of the techniques is given in Section 4.5.1.	

BAT-AELs for dust emissions from kilns

- ***BAT-associated emission levels***

The BAT-AEL for dust emissions from flue-gases of kiln firing processes is

<10 – 20 mg/Nm³ ← At 10 % O_2

as the daily average value. When applying fabric filters or new or upgraded ESPs, the lower level is achieved.

Available information on mercury emissions (for the review of the CLM BREF)

- ***Quality of available information***
  - *Emission levels <0.05 mg/Nm^3 reported as achievable; however, lack of evidence concerning the conditions for achieving these levels*
  - *Levels of emissions mainly influenced by raw materials*
- ***Lack of information:***
  - *Mercury emissions and link with technical options for Hg removal*
  - *Monitoring techniques for Hg (continuous monitoring of Hg, suitability to be verified)*

Work for the next review of the CLM BREF

- ***Collect information on the following topics:***
  - *Relationship between emissions and waste used in the process (type, amount)*
  - *Data on process input, specifically for Hg*
  - *"New" techniques for the reduction of mercury emissions*
  - *Removal efficiencies and costs of abatement techniques*
  - *Continuous monitoring of Hg in the cement industry*

Thank you for your attention

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