

BEST AVAILABLE TECHNIQUES FOR THE CERAMIC INDUSTRY

The Centre for Best Available Techniques (BAT) is founded by the Flemish Government, and is hosted by VITO. The BAT centre collects, evaluates and distributes information on environment friendly techniques. Moreover, it advises the Flemish authorities on how to translate this information into its environmental policy. Central in this translation is the concept "BAT" (Best Available Techniques). BAT corresponds to the techniques with the best environmental performance that can be introduced at a reasonable cost.

This report discusses the BAT for the ceramic industry. The report is a review of the first version of the BAT-report, which was published in December 1999. When selecting the Best Available Techniques (BAT) for the ceramic industry, special attention was paid to the aspect of air pollution. The flue gases that arise during the firing process, are a source of SO_x, HF, HCl, dust, VOC emissions. Furthermore dust emissions occur during transport and handling of the raw materials.

The selected BAT consist on the one hand side of a number of process integrated measures that can be taken by the ceramic industry to prevent emissions. An important measure in this respect is the addition of low-S and Ca-rich raw materials and additives, e.g. loams or paper fibre, to reduce SO_x and HF emissions. On the other hand side the BAT also include a number of flue gas cleaning techniques by which the remaining emissions can be removed from the flue gases. More specifically, it is BAT to use a dry flue gas cleaning installation (cascade type adsorption installation or dry flue gas cleaning with filter) for removal of SO_x, HF, HCl and dust, and to use thermal afterburning for VOC removal from flue gases with VOC concentrations > 150 mg/Nm³).

By applying BAT, the following emission limit values are considered to be achievable for the Flemish ceramic industry:

	BAT associated emission limit values (in mg/Nm ³ @ 18 % O ₂)	
SO _x	- < 0,25 % S in the main raw material:	500
	- 0,25–0,50 % S in the main raw material:	500
	- 0,50–0,75 % S in the main raw material:	500-1000*
	- > 0,75 % S in the main raw material:	1000-1500*
HF		10
HCl		30
Dust	- cascade type adsorption installations:	50
	- production of expanded clay aggregates:	50
	- other installations:	20
VOC	- without thermal afterburning:	150
	- with thermal afterburning:	50
CO	- production of clay blocks, round kilns and firing in open air:	1500
	- other kilns without thermal afterburning:	800
	- other kilns with thermal afterburning:	100
NO _x		500
*: depending on the availability of low-S and Ca-rich loams		

Application of the BAT is not sufficient for the ceramic industry to reach the SO_x emission reduction targets set by the Flemish authorities in the frame of the NEC-directive. In order to reach these targets, measures beyond BAT are necessary. Amongst these are wet flue gas cleaning, but also the addition of paper fibre to the raw materials, at least on condition that the latter can be done under feasible permit conditions.

The BAT selection in this study was based on a socio-economic study, cost calculations, a comparison with foreign BAT-documents and the European BREF Ceramics, plant visits, discussions with industry experts and authorities, The formal consultation was organised by means of an advisory committee.

Full Dutch version available [here](#) (1933 Kb)

For more information:

Diane Huybrechts

tel. +32 14 33 58 67

e-mail: diane.huybrechts@vito.be