

## **7.38 Wood impregnation**

### **7.38.1 Coverage**

This sector covers the wood impregnation in organic solvent-based preservatives, creosote and water-based preservatives. Wood preservatives may be supplied for both industrial and domestic use. Only industrial applications are treated in this section.

### **7.38.2 Emission sources**

Wood is preserved to protect it against fungal and insect attack and also against weathering. Different types of preservatives are used [1]:

solvent-based preservatives: traditional preservative systems consist of approximately 10% active ingredient and 90% organic solvents, usually whit spirit or other petroleum-based hydrocarbons. Without additional measure, the reference VOC emission is about 19.8 kg/m<sup>3</sup> of wood treated,

concentrated pesticide systems: these are solvent-based solutions with a higher concentrations of pesticides,

water-based preservatives: they consist of solutions of salts in water. VOC emission reductions above 99% are observed compared to the reference situation,

creosote: it is an oil prepared from coal tar distillation. Approximately 10% of the creosote used for wood preservation is made up of VOC.

The estimation of emissions can either be based on the quantity of preservatives consumed or on the quantity of timber treated.

The application of the preservative may be carried out via vacuum processes, pressure processes, dipping, spraying or brushing. The vacuum process may vary slightly, depending on the preservative product. The application efficiency of the pesticide for dipping and brushing is close to 90% and using the vacuum process with full containment is close to 100%. Spraying has a much lower efficiency, i.e. from 5 – 50%.

### **7.38.3 BAT, Associated Emissions Levels (AEL)**

According to the STS BREF [1], it is BAT to use a vacuum impregnation with water-based or high concentration pesticide solvent systems or waste gas treatment such as activated carbon or condensation. 99% reduction can be achieved using water-based systems and 70% with solvent-based systems and waste gas treatment (about 15 to 25% of the solvent remains in the wood and evaporate over the life of the product).

As a significant amount of solvent is released after the wood has been treated, it is BAT to use solvents with lower ozone-forming potentials.

Techniques and corresponding associated emission factors defined in the table below originate from the EGTEI background document [2].

**Table 1: Emission sources and selected VOC control measures with associated emission levels for impregnation of wooden surfaces**

Emission source	Combination of control measures	BAT associated emission levels for VOC [2] [Defined for the following averaging period: yearly for total AEL]
All installations	100% of solvent based preservatives vacuum impregnation system and waste gas treatment such as activated carbon or condensation* (adsorption on cartridges with off-site recovery or disposal may also be considered)	~ 6 kg/m <sup>3</sup> wood treated
	Process optimisation 100% of more concentrated solvent based preservatives vacuum impregnation system	11 kg/m <sup>3</sup> wood treated
	100% of water based preservatives vacuum impregnation system	~ 0.2 kg/m <sup>3</sup> wood treated

\* According to the STS BREF [1], treatment of emissions is carried out in large installations when, in small plants, abatement equipment may not be economically viable.

#### 7.38.4 Cost data for emission reduction techniques

Costs and methodologies are defined in the EGTEI documents concerning “preservation of wood” [2]. Abatement costs for primary measures vary from 0.3 to 0.7 k€/tonne of VOC abated and are even negative in some particular cases. When secondary measures are implemented, abatement costs vary from 1 to 21 k€/tonne of VOC abated depending on the size of the installation and on the technique used.

**Caution:** these documents are susceptible to evolve if new updated data are available.

#### 7.38.5 Emerging techniques

No data is available.

#### 7.38.6 References used for chapter 7.38

[1] STS BREF – August 2007

[2] EGTEI background document/synopsis sheet: Wood preservation – 2004/2005