# 2.D.3.g - Chemical Products

## Short description

| Category Code | Method | | | | | AD | | | | | EF | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.D.3.g | T2 | | | | | NS | | | | | CS | | | | |
| | NO$_x$ | NMVOC | SO$_2$ | NH$_3$ | PM$_{2.5}$ | PM$_{10}$ | TSP | BC | CO | Pb | Cd | Hg | Diox | PAH | HCB |
| Key Category: | - | L/- | - | - | - | - | - | - | - | - | -/- | - | - | - | - |

**T** = key source by Trend **L** = key source by Level

| Methods | |
|---|---|
| **D** | Default |
| **RA** | Reference Approach |
| **T1** | Tier 1 / Simple Methodology * |
| **T2** | Tier 2* |
| **T3** | Tier 3 / Detailed Methodology * |
| **C** | CORINAIR |
| **CS** | Country Specific |
| **M** | Model |

\* as described in the EMEP/CORINAIR Emission Inventory Guidebook - 2007, in the group specific chapters.

| AD - Data Source for Activity Data | |
|---|---|
| **NS** | National Statistics |
| **RS** | Regional Statistics |
| **IS** | International Statistics |
| **PS** | Plant Specific data |
| **AS** | Associations, business organisations |
| **Q** | specific questionnaires, surveys |

| EF - Emission Factors | |
|---|---|
| **D** | Default (EMEP Guidebook) |
| **C** | Confidential |
| **CS** | Country Specific |
| **PS** | Plant Specific data |

Source category *NFR 2.D.3.g - Chemical products* comprises NMVOC emissions from the use of solvents in the following manufacture processes:

- Polyester processing
- Polyvinylchloride processing
- Polyurethane processing
- Polystyrene foam processing
- Rubber processing
- Pharmaceutical products manufacturing
- Manufacture of paints and lacquers,
- Manufacture of inks
- Glues manufacturing
- Asphalt blowing
- Adhesive manufacturing, magnetic tapes manufacturing, photographs manufacturing
- Solvents manufacturing:
  - Manufacture of wood preservatives
  - Manufacture of building material additives
  - Manufacture of solvent-based consumer goods
  - Manufacture of surface cleaning agents
  - Manufacture of antifreeze agents and de-icers
  - Manufacture of waxing and dewaxing agents
  - Manufacture of paint strippers

'NMVOC' is defined in accordance with the VOC definition found in the EC solvents directive. For purposes of the definition of solvents, the term 'solvent use' is also defined in accordance with the EC solvents directive.

# Method

### General procedure

NMVOC emissions are calculated in keeping with a product-consumption-oriented approach. In this approach, solvent-based products or solvents are allocated to the source category, and then the relevant NMVOC emissions are calculated from those solvent quantities via specific emission factors. Thus, the use of this method is possible with the following valid input figures for each product group:

- Quantities of VOC-containing (pre-) products and agents used in the report year,
- The VOC concentrations in these products (substances and preparations),
- The relevant application and emission conditions (or the resulting specific emission factor).

The quantity of the solvent-based (pre-)product corresponds to the domestic consumption which is the sum of domestic production plus import minus export.

NMVOC Emission = domestic consumption of a certain product * solvent content * specific emission factor

The calculated NMVOC emissions of different product groups for a source category are then aggregated. The product / substance quantities used are determined at the product-group level with the help of production and foreign-trade statistics. Where possible, the so-determined domestic-consumption quantities are then further verified via cross-checking with industry statistics.

# Discussion of emission trends

### General information

Since 1990, so the data, NMVOC emissions from use of solvents and solvent-containing products in general have decreased by nearly 38%. The main emissions reductions have been achieved in the years since 1999. This successful reduction has occurred especially as a result of regulatory provisions such as the 31st Ordinance on the execution of the Federal Immissions Control Act (Ordinance on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain facilities – 31. BImSchV), the 2nd such ordinance (Ordinance on the limitation of emissions of highly volatile halogenated organic compounds – 2. BImSchV) and the TA Luft.

### Specific information

Since 1990, data of source category 2.D.3.g are recorded. Since 2000, a more detailed data collection procedure enables to follow the development of different applications, which altogether accounts for about 7 - 8% of total NMVOC emissions from solvent-based products.

Total emissions of NMVOC emissions of 2.D.3g remain relatively stable. In some major activities amounts of NMVOC emissions raised, such as from solvents used in polystyrene foam processing and the manufacture of solvent-based consumer products.

# Uncertainties

Emission factors: Relative error rates at ±15% and ±25% (for Asphalt blowing; Adhesive manufacturing, magnetic tapes manufacturing, photographs manufacturing) were applied, but not exceeding 100% or falling below 0%. Uncertainties refer to a 95% confidence interval.

# Recalculations

For specific **information on recalculated emission estimates for Base Year and 2018**, please see the pollutant specific recalculation tables following chapter 8.1 - Recalculations.

# Planned improvements

**Asphalt blowing**

The process of air blowing of asphalt could not only be conducted at oil refineries but also at asphalt processing and asphalt roofing plants. The emissions of air pollutants in that plants depend on various parameters like process conduct and measures to control and abate emissions. All that information is not available to determine the activity rates and emission factors. The Tier 2 emission factors for asphalt blowing in the EMEP/EEA air pollutant emission inventory guidebook 2019 only are uncontrolled emission factors based on US plants before 1980 seeming unsuitable to represent national conditions. Therefore it is planed to gather information to report emissions on a Tier 2 level. That reporting could not start before submission 2022. Meanwhile the correct notation keys for PAH emissions in 2.D.3.g in the NFR-tables must be set to NE.