

Appendix 2 to the Basic Award Criteria RAL UZ 195

Definitions (based on the Industrial Emissions Directive 2010/75/EU):

Volatile organic solvents

Volatile organic solvents" within the meaning of the Basic Award Criteria are organic compounds (VOCs) which have a vapour pressure of 0.01 kPa at 293.15 K (20°C) or have a corresponding volatility under the respective conditions of use (e.g. afterburner in the drier during heatset web offset printing).

Paper

In the context of these Basic Award Criteria, "paper" in the following calculations refers to printable materials (paper, cardboard) incl. maculature and trimmings. Packaging paper and cardboard packaging are not included in the calculations. Paper and cardboard provided by the customer must be taken into consideration.

Reference period

Any previous 12 month period can be selected by the applicant as the reference period for the following calculations. However, the end of the 12 month period must not be earlier than 12 months before the application.

Measurement values

All reference values in the following calculations shall be given in units of mass. If only the volumes of the purchased quantities is known, this information shall be converted into mass using the density stated in the safety data sheet.

Calculation formulas

1. Total emissions:
Total emissions (G) [kg]: $E - Z - A - R - L$
2. Key figure for the quantity:
Key figure for the quantity [kg/t]: $G / P1$
3. Key figure for the surface area:
Key figure for the surface area [kg/m²]: $G / P2$

Input paper (P):

- P1** Amount of paper [t] that was purchased or provided over a 12 month period.
- P2** Surface area of paper [m²] that was purchased or provided over a 12 month period.

Quantity of volatile solvents purchased [kg]:

- E** The quantity of volatile organic solvents purchased or the share of volatile organic solvents in the quantity of mixtures purchased (e.g. toluene, ethanol, ethyl acetate in purchased printing inks or ethanol in dampening solution additives for offset printing) as well as the share of organic solvents which are volatile under the conditions of use (e.g. in the drier during heatset web offset). If the Material Safety Data Sheet does not specify the exact solvent content but gives a certain range the average of such range or an exact manufacturer-documented content shall be used.

Discharge of volatile organic solvents [kg]:

- Q** Waste gas emissions downstream of a treatment plant for volatile organic compounds (oxidation/combustion or recovery), which is calculated by determining the volumetric flow rate [m^3] and total concentration of carbon [mg] (stated for standardised conditions of 273.15 K and 1013.25 hPa), as well as by converting the total carbon into total VOC [mg]. The conversion factor "C->VOC" for individual substances corresponds to the ratio of the molecular weight of the carbon content relative to the complete substance. For emissions from mixtures, a conversion factor for the mixture containing the volatile organic solvent recommended by a testing institution shall be used.
- Z** Amount of volatile organic solvents destroyed by waste gas treatment (e.g. oxidation/combustion). The destroyed amount is defined as the difference between the amount of volatile organic solvents before the waste gas treatment plant and fraction "Q". The conversion of total carbon to VOC is carried out as for fraction "Q". A continuous measurement of the volumetric flow rate and total carbon in the untreated gas (e.g. lower explosive limit (LEL) measurement) should be used where possible as the basis for the calculations.
- A** Proportion of volatile organic solvents in waste, which is properly disposed of and whose destruction or recovery is certified by the waste disposal company. The proportion of volatile organic solvents in waste should be determined using representative measurements of every waste fraction (e.g. volatile organic solvents in ink residues, in contaminated cleaning agents, in distillation sludge). The amount of volatile organic solvents in cleaning cloths that are properly disposed of after being stored in closed containers can be estimated by using the number of cleaning cloths delivered and taking comparative weight measurements of the cleaning cloths with/without solvents.
- R** Recovered volatile organic solvents or their proportion in recovered mixtures, insofar as the solvent has not been reused within the 12 month period being considered but is

instead intended for future internal use and thus increases the company's own stocks compared to the initial stock levels.

- L** Volatile organic solvents contained in commercially produced products (e.g. the manufacture of printing inks, varnishes or adhesives) or recovered during operation and delivered to external companies (e.g. ink manufacturers) for direct recycling. Solvents that are delivered to waste disposal companies for treatment do not belong to the fraction "L" but rather to the fraction "A".

Other fractions that are not relevant to the calculation:

- W** Volatile organic solvents recovered internally within the company in the 12 month period and reused in the same 12 month period.
Increases in the stock levels of recovered solvents (between the start and end of the 12 month period) are to be recorded as fraction "R". Determining the fraction "W" is not required for calculating the key figures.
- X** Volatile organic solvents that find their way into wastewater. It is assumed that these solvents evaporate from the wastewater before they are destroyed by microorganisms and thus escape into the environment as diffuse emissions. Determining the fraction "X" is not required for calculating the key figures.
- V** Volatile organic solvents that are contained in products as impurities or residues (e.g. residual emissions from toluene, ethanol or isopropanol from finished printed matter). It is assumed that these solvents evaporate and thus escape into the environment as diffuse emissions. Determining the fraction "V" is not required for calculating the key figures.
- D** Diffuse emissions of volatile organic solvents insofar as they are not contained in X, V or U – meaning emissions through windows and doors. Roof fans and other discharge outlets without waste gas treatment belong to the fraction "D". Determining the fraction "D" is not required for calculating the key figures.
- U** Volatile organic solvents that are unintentionally released e.g. due to accidents or other unplanned, uncontrolled emissions into the environment. Determining the fraction "U" is not required for calculating the key figures.