

Comment on the VOC Directive

(January 2008 - cw)



Status of the legislation directives

According to the VOC Directive, VOCs are volatile organic compounds with a vapour pressure of 0.01 kPa or more at 293.15 K and a corresponding volatility depending on the processing conditions, like e.g. benzene.

The Swiss VOC definition which is stricter than the one of the EC Directive includes in addition to the vapour pressure of 0.01 kPa at 293.15 K a limit value for the boiling point which must not be below 240° at 1013.25 hPa. A fee is collected for all VOC substances, exceptions are specified on a positive list.

Due to the characteristics of these substances, the use of VOCs will lead in certain processes and in certain systems to a release of organic compounds into the air which may be harmful to the human health. Besides, VOCs affect the local or limit value exceeding formation of photochemical oxidants in the boundary layer of the troposphere, which may lead to a damage of the natural resources important for the environment and for the economy and, under certain circumstances, this may also be harmful for the human health. This comprises e.g. the summer smog which builds up in air layers near the ground with ozone resulting from VOCs. The companies within the printing industry are also counted among the VOC emitters due to their use of easily volatile cleaning agents and isopropanol in offset printing.

When operating for example a Lithoman IV, the following average consumption quantities are to be expected (all indications in liter):

Silicone:	48.000	(no VOC)
Fountain solution	37.000	(partly VOC)
Cleaning agent	20.000	(partly VOC)
IPA	80.000	(100 % VOC)

VOC Directive

On 11 March 1999 the VOC Directive (Solvent Directive) was passed in Brussels. The objective of this EC Directive is to cut down drastically all over Europe the solvent emissions which contribute to the forming of the harmful ozone near the ground. This shall be achieved by setting limit values for emissions of exhaust gases of plants and also by limiting the volatile contents. Rotary printing presses are subject to the VOC Directive. However, for the various printing processes different registration limits are valid. The VOC Directive has to be put into German legislation within two years. This means that the requirements for avoiding solvent emissions will be extended according to the federal immission control act which does not yet include any limitation of the diffuse emissions.

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Volatile and collected emissions

The emissions which still exist after cleaning of the exhaust gases are called "collected emissions". The "volatile emissions" on the other hand are those quantities which leak uncontrolled through "windows and chinks". The new regulation of the German approval right to be expected due to the VOC Directives will also impose limit values on both emission types for printing presses.

In order to provide comparable and manageable variables for every day use, the evaporable parts are converted into carbon dioxide equivalents.

Released carbon dioxide equivalents for VEGRA Rapid Washes

Rapid Wash 220 063

Based on an average molecular weight of $M = 178$ g/mol and a statistic carbon chain length of C_9 to C_{12} an average amount of released carbon dioxide is calculated of

- 2,050 g CO_2 related to 1,000 ml RW 220 063
- 2,600 g CO_2 related to 1,000 g RW 220 063

Rapid Wash 220 212

Based on an average molecular weight of $M = 198$ g/mol and a statistic carbon chain length of C_{13} to C_{15} an average amount of released carbon dioxide is calculated of

- 2,530 g CO_2 related to 1,000 ml RW 220 212
- 3,110 g CO_2 related to 1,000 g RW 220 212

Rapid Wash 220 221

The content of volatile substances is cut in half with regard to the a.m. cleaner due to reducing the raw oil content by clever substitution with ecological substances.

- 1,260 g CO_2 related to 1,000 ml RW 220 221
- 1,560 g CO_2 related to 1,000 g RW 220 221

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Rapid Wash 220 300

This is a heatset cleaner according to the latest state of the art with especially low VOC contents, even under the conditions in the dryer.

- 1,170 g CO₂ related to 1,000 ml RW 220 300
- 1,380 g CO₂ related to 1,000 g RW 220 300

Please take note that according to the definition, VOC-free products turn into VOC materials when exposed to higher temperatures as they are reached in the drying ovens of heatset presses. Due to the drying temperatures of approx 300°C and paper web temperatures of approx. 130°C the non-VOCs partly evaporate and turn into VOCs.

This explains why RW 220 212 and 220 215 emit 2,530 g CO₂ related to a cleaner quantity of 1000 ml, for RW 220 221 it is 1,260 g and for RW 220 300 it is 1,170 g CO₂.

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