

Solvent laws in Europe

The development

Warum LM-Gesetzgebung?

- The chemical decomposition processes of volatile organic compounds (VOC - any organic substance that evaporates at ambient temperature) causes near-ground OZONE to form.
- This is harmful to humans, flora and fauna if certain limits are exceeded

Discussion of safe limits in Europe (24 h mean figure):

- OZON limit, Europe **120 µg/m³**
- OZON limit, Germany **65 µg/m³**

This means that even with a European directive, each EU member country can set stricter limits.

1. International treaty

1988

30 % reduction in VOC by 1999 as against 1988

- 1% of firms are covered who account for 20% of VOC emissions
- 99 % of firms are not covered by the law, but account for 80% of VOC emissions

2. International treaty

1999

60 - 70 % reduction in VOC by 2010 as against reference period of 1984 - 1990

- can only be achieved if small/medium-sized firms also reduce emissions

EU VOC Directive 2001

- Central element of the directive: Solvent Management Plan (SMP), with substance balance, input/output account, to monitor more efficient material use.

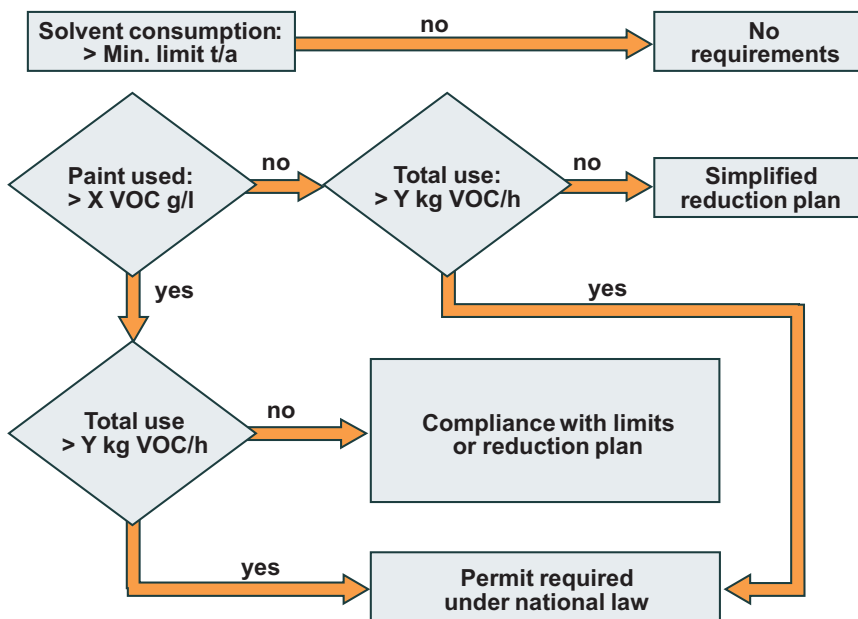
Reduction in VOC:

- Monitoring of permitted limits in flue gas (only 5 - 30% VOC released in furnaces)
- Promotion of low-solvent coatings, application technologies through reduction plan (till today, only 10 - 20% low-solvent products in use)

Examples of VOC reduction

	Threshold	Limits with flue gas cleaning	Diffuse emissions released with air, water, soil or products	Reference value formulation	
				Mean solvent content today	Mean solvent content targeted for 2004/2005
	[t VOC/a]	[mg C/m ³] Appl./Fumace	[% of solvent quantity used]	[%]	[%]
Vehicle and repair paints	< 15	50 / 50	25	71	50
Metal and plastic coatings	5-15 > 15	75 / 75 50 / 20	25 20	60 60	37 18
Aircraft/food-stuff contact paints	5-15 > 15	75 / 75 50 / 20	25 20	67 67	44 23
Wood and furniture paints	(5) / 15 - 25 > 25	75 / 75 50 / 20	25 20	75 75	54 31
Adhesive coating	5-15 > 15	100 / 50 50 / 20	25 20	75 75	47 31

Permit required - yes/no?



Example: Germany, wood sector

VOC Directive:	
Apr/01	Valid Europe-wide
German solvent law:	
New plants	
Apr/01	Threshold values must be met immediately by new plants
Okt/01	Target emission X 1.5
Okt/04	Meet target emission
Existing plants	
Okt/01	Meet threshold value
Apr/05	Target emission X 1.5
Apr/07	Meet target emission
Definition of target emission for the wood sector:	
Solid matter t/a X Factor 1 X Factor 2 (in %) = Target emission t/a	
Factor 1 = 4	
Factor 2 (at 15 - 25 tVOC/a) = 40%	
Factor 2 (at >25 tVOC/a) = 25%	

Wood sector, Germany, in concrete terms:

- > 5 - 15 t/a = Solvent balance, possibly with simplified reduction plan, in concrete terms: 2.9 kg/h solvent consumption
- > 15 t/a = Flue gas cleaning, in concrete terms: 8.5 kg/h solvent consumption

Example: Holland, rules for spray applications

- Painter's certificate, painter is tested every four years.
- From 2004, it is planned to have only organisation-certified spray plants for spray applications.
- Guns only permitted with minimum application efficiency (TE) of 72 % according to official test procedure.

Alternative coating materials

- **Powder paints** (Substrate compatibility, coating thickness, quality)
- **Water-based paints** (Substrate compatibility, stainless steel equipment, drying)
- **High Solids** (spray viscosity, multi-components)
- **Radiation-hardening paints** (Drying, shear/light sensitivity)

Alternative application techniques

- **High application efficiency**
Electrostatic, AirAssist, HVLP
- **Multi-component plants**
ProBatch, ValueMix, Ecomix, ProMix, PMix
- **Plant components**
Saving in cleaning agents through special design