Critical amounts

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One method for calculating the critical volumes was developed by the Swiss Federal Office for the Environment (FOEN). The calculation is based on calculating the volume of air or water that is polluted up to the critical value due to the existence of each respective harmful substance released into a medium.[1] Thus, a weighing based on critical values takes place.

Key figures for

- ❿ critical amount of air in m³/kg
- ❿ critical amount of water in dm³/kg
- ❿ fixed waste amount in cm³/kg
- ❿ energy equivalent value in MJ/kg

were determined.

1 Swiss method of critical amount

$$critical\,amount_{i,m}\,[m^3]$$
$$= \frac{emission\,load\,of\,harmful\,substance_i \in environmental\,medium_m\,[g]}{critical\,value\,of\,harmful\,substance_i \in environmental\,medium_m\,[g/m^3]}$$

$$total\,critical\,amount_m[m^3] = \Sigma critical\,amount_{[I,m]}[m^3]$$

2 Quantification of exposure:

Determining the absorption doses of harmful substances by organisms according to intensity, frequency and duration:

$$I = \frac{C * [KM * EF * ED * R]}{[KG * AT]} + UB$$

I   dose rate   [mg/kg body weight/d]

C   contact concentration; concentration of harmful substance with which there was contact during   the period of exposure [e.g. mg/l water]

KM   contact amount; amount of contaminated medium with which there was contact per time unit [e.g. l/d]

EF   exposure frequency [d/a]

ED   exposure duration [a]

R   resorption rate [-]

KG   average body weight [kg]

AT   average time period of substance absorption [a]

UB   ubiquitary dose rate from food, water and air [mg/kg body weight/d]

[Müllhandbuch 4322, MuA Lfg. 1/1996]

[1]   Bundesamt für Umweltschutz (BUS) (1984): *Ökobilanzen von Packstoffen*, Schriftenreihe Umweltschutz, Nr. 24., Bern 1984, S.16