3.2 General emission standards

3.2.1 Compulsory minimisation substances

Some substances are so (environmentally) hazardous that their emissions should be zero. To tackle the process emission of such substances, the effort must be focused on achieving zero emission. This is called compulsory minimisation (see §2.3.7).
Compulsory minimisation applies to all substances that can be released to the air and are classified in the category Very High Risk Substances and compulsory minimisation applies to all substances classified in the category MVP 1 and MVP 2 (see the overview of all classified substances in Appendix 4.5).

Very High Risk Substances
A substance is classified in the category Very High Risk Substances on the basis of extreme toxicity, persistence and bio-accumulation behaviour (extreem risicovolle stoffen, ERS)(see table).
The effort must be focused on achieving zero emission of Very High Risk Substances. These substances are subject to compulsory minimisation.
For an emission load of more than 20 mg per year, an emission requirement of 0.1 nanogram teq /m_o^3 applies.

Very high risk substances
Name of substance
• Polybromated dibenzodioxins
• Polybromated dibenzofurans
• Polychlorinated bifenyles (PCB)
• Polychlorinated dibenzodioxins (PCDD)
• Polychlorinated dibenzofurans (PCDF)
• Polyhalogenated dibenzodioxins
• Polyhalogenated dibenzofurans

Compulsory minimisation substances class MVP 1 and MVP 2
A mass flow limit applies for compulsory minimisation substances. When it is exceeded, the requirements on the emission of compulsory minimisation substances can be established in accordance with the following step-by-step plan.

The compulsory minimisation procedure occurs in five steps. The core of the procedure is that, on the basis of information concerning the company, an inventory is taken of the possibilities available to prevent or reduce the emission of compulsory minimisation substances. In so doing, explicit account must be taken of the preference order of the measures to be taken: 1. *prevention* of the emission and 2. *reduction* of the emission.

In the case of prevention of an emission, the effort must first be focused on replacing the compulsory minimisation substance with a less harmful substance. If that proves impossible, alterations of the process and the installation must be considered.

The step-by-step process is repeated every five years with the aim of implementing new insights and developments in Best Available Control Technology to curb the emission of substances subject to compulsory minimisation.

Assessment of compulsory minimisation substances
The assessment of compulsory minimisation substances in the NeR is based on the approach in SOMS, the substances policy of the Cabinet (see *Strategienota Omgaan Met Stoffen* (Policy document Strategy on Management of Substances) adopted by the Council of Ministers on 16 March 2001. This assessment is based on a deliberation that occurs in two tracks. The final conclusion is the result of both tracks.

The first track is the technical track: what emission reduction is feasible? The other track is the environmental risk: when does an emission no longer produce undesired environmental and health risks? The technical track leads to the establishment of emission levels. These levels correspond, in principle, with the emission requirements in substance classes MVP 1 and MVP 2.

The second track is the environmental track. This consists of a qualitative testing of the consequences of the emission for the environmental quality. The immission, or the environmental quality, resulting from the emission of the MVP substance is tested against the legal limit values for air quality. For substances not subject to legal limit values, a test is made against an environmental quality standard established by the competent authorities. Until the year 2010, the competent authorities can use the level of the Maximum Permissible Risk (Maximaal Toelaatbaar Risico, MTR) as environmental quality standard. From 2010 and in the assessment of new situations, the competent authorities must use the level of the negligible risk (VR) as environmental quality standard. If no value for the level of the MTR or VR is known for the substance in question, the competent authorities must determine a provisional value for the MTR or VR. Such an estimated value for the VR is called the indicative negligible risk (indicatief Verwaarloosbaar risico, iVR) in the NeR.

The tests of concentration levels against an established VR or iVR level is done in the same way in the system of the NeR. If in this section reference is made to VR, it also means iVR, unless stated otherwise.

If application of the general emission requirement involves underspending the environmental quality standard, the general requirement for the MVP substance in question can be prescribed.
If application of the general emission requirement involves exceeding of the environmental quality standard, a lower emission requirement than the general requirement for the MVP substance in question must be prescribed to ensure the environmental quality aimed for is complied with.
If the permit applicant is of the opinion that a higher emission than the general requirement for the MVP substance in question must be prescribed, an extensive risk analyses must be made showing that the VR level is not exceeded.

The step-by-step plan in brief
The step-by-step plan is presented in detail in Appendix 4.15: 'Compulsory minimisation procedure'.

Step 1: Determining the emission situation of the company.
The company furnishes information on the substances being used, what the emission situation is and which substances are emitted to the air. Here it is indicated which MVP substances are released.

Step 2: Preliminary investigation – inventory possibilities.
The pemit applicant prepares an overview of the existing emission-abatement and emission-prevention techniques / measures and the possibilities for replacement. Different aspects (environmental health, economic and feasibility) are mapped qualitatively for each technique.

Step 3a: Further investigation – limited immission check.
The permit applicant prepares a qualitative risk assessment. The immission is tested against the environmental quality standard.

Step 3b: Further investigation – comprehensive immission check.
If in step 3a it is shown that the immission level exceeds the environmental quality standard, the permit applicant must perform a comprehensive immission test. The purpose of this test is to determine more precisely what the immission is and if the environmental qualty standard is exceeded.
The permit applicant prepares a qualitative risk assessment. The immission is tested against the environmental standard.

The permit applicant conducts a further investigation for a limited number of promising techniques / measures from the preliminary investigation. The purpose of this investigation is to collect information in order to make a well-founded choice for a technique possible.

Step 4: Implementation of measures.
If the environmental quality standard is complied with or if the competent authority permits an immission above the environmental quality standard (see Appendix 4.15) the permit can be granted.
On the basis of the information from the preliminary investigation, a choice is made for a technique or measure. If the preliminary investigation produces insufficient information, the company must prepare a plan of investigation that can be used to obtain the missing information.

Step 5: Compulsory investigation and re-assessment.
Compulsory minimisation is a continuous effort to reduce the emission. It is achieved by assessing and supplementing the existing information and possibilities every five years.

Risk assessment
The risk assessment in step 3 comprises a qualitative test of the emission applied for against the environmental quality standard (MTR or VR level). The risk assessment is of a qualitative nature because in many cases a quantitative assessment is not possible due to lack of information; often it is of no significance given the scale of the emission.

The risk assessment is performed as follows:
Upon applying for a permit, information is furnished on the substances being released. The competent authority determines the air quality standard. If no MTR or target level / VR has been derived for the substance in question, the Chemicals Expertise Centre (SEC) of the National Institute for Public Health and the Environment (RIVM) can make an estimate of the MTR or VR for that substance. This value can be used as an indicative VR (iVR).

It is also determined what immission level belongs to the emission of a MVP substance at the level of the general requirement in the NeR. If the actual emission is lower than the general requirement, the emission test can also be based on the actual emission. The immission level is tested against the air quality standard. If the immission level remains below the air quality standard, the general emission requirement can be included in the permit. If the test is based on the actual emission, the actual emission should be included in the permit. If the air quality standard is exceeded, additional measures must be taken and a value lower than the general requirement must be included in the permit.

If the permit applicant is of the opinion that a higher emission than the general requirement for the MVP substance in question must be prescribed, a comprehensive risk analysis must be performed showing that the environmental quality standard is not exceeded.

To perform the risk assessment, a model has been developed for estimating the effect of the emission on the environmental quality. This model for the limited immission test is available on the website of InfoMil. A list of examples of known values of MTR and VR levels will also be given there.

Emission requirements

The substances in the category compulsory minimisation substances are classified in one of the two substance classes MVP 1 and MVP 2 (see table). Limit levels belong to these substance classes. These requirements indicate what emission levels are feasible at maximum application of the available measures. For new situations these values can be regarded as an absolute upper limit for the emission concentration for which a permit is sought.
For existing situations, a higher emission concentration than the values of the mvp requirements may be allowed on the basis of a weighing of the technical and economic possibilities. This is subject to the condition that the environmental effects remain below the level of the air quality standard.
Even if the target levels are complied with, a continuous effort must be made to reduce the emission. This will be fleshed out later by means of the compulsory investigation.

The following emission requirements apply for substances subject to compulsory minimisation.

MVP 1: For an emission load of 0.15 gram per hour or more, an emission requirement of 0.05 mg/m_o^3 applies. Class MVP 1 is applies to the emission of solid substances, because for solid substance a very high degree of cleaning is possible with filtering separators.

MVP 2: For an emission load of 2.5 grams per hour or more, an emission requirement of 1 mg/m_o^3 applies. Class MVP 2 is applies to gaseous or vaporous substances. The upper emission level of 1 mg/m_o^3 is feasible with existing cleaning techniques.

Overview of MVP 1 substances in NeR 2004

CAS number	Chemical name	Class
108-70-3	1,3,5-trichlorobenzene	MVP1*
115-32-2	dicofol	MVP1*
118-74-1	hexachlorobenzene	MVP1*
1321-64-8	pentachloronaphthalene	MVP1*
1321-65-9	naphthalene, trichloro-	MVP1*
1335-87-1	naphthalene, hexachloro-	MVP1*
1335-88-2	naphthalene, tetrachloro-	MVP1*
140-66-9	1,1,3,3-tetramethyl-4-butylphenol (4-tert-octylphenol)	MVP1*
143-50-0	chlordecone	MVP1*
1582-09-8	trifluraline	MVP1*
16812-54-7	nickel sulfid	MVP1 3)
1825-21-4	Pentachloroanisole	MVP1*
18450-29-9	chromium VI compounds	MVP 1 6)
189-55-9	dibenzo[a,i]pyrene (PAH)	MVP1
191-24-2	benzo(ghi)perylene (PAH)	MVP1
191-30-0	dibenzo[a,l]pyrene (PAH)	MVP1
192-65-4	dibenzo[a,e]pyrene (PAH)	MVP1
193-39-5	indeno(1,2,3-cd)pyrene (PAH)	MVP1
194-59-2	dibenzo[c,g]carbazol (PAH)	MVP1
205-82-3	benzo[j]fluoranthene (PAH)	MVP1
205-99-2	benz[e]acephenanthrylene(= benzo [b]fluoranthene) (PAH)	MVP1
206-44-0	fluoranthene (PAH)	MVP1
207-08-9	benzo[k]fluoranthene (PAH)	MVP1
2104-64-5	EPN	MVP1*
218-01-9	chrysene (PAH)	MVP1
2227-13-6	Tetrasul	MVP1*
224-42-0	dibenz[a,j]acridine (PAH)	MVP1
226-36-8	dibenz[a,h]acridine (PAH)	MVP1
23593-75-1	1H-imidazol, 1-[(2-chlorophenyl) diphenylmethyl]-	MVP1*
28680-45-7	heptachloronorbornene	MVP1*
294-62-2	cyclododecane	MVP1*
309-00-2	Aldrin	MVP1*
32241-08-0	naphthalene, heptachloro-	MVP1*
32534-81-9	diphenyl ether, pentabrome	MVP1*
330-54-1	Diuron	MVP1*
3424-82-6	DDE, o,p- isomer	MVP1*
36065-30-2	benzene, 1,3,5-tribromo-2-(2,3-dibromo-2-methylpropoxy)-	MVP1*
465-73-6	Isodrin	MVP1*
470-90-6	Chlorfenvinphos	MVP1*
4904-61-4	1,5,9-Cyclododecatriene	MVP1*
50-29-3	DDT, 4,4'- isomer	MVP1*
50-32-8	benzo[a]pyrene (PAH)	MVP1
512-04-9	spirost-5-en-3-ol, (3beta,25R)-	MVP1*
53-70-3	dibenz[a,h]anthracene (PAH)	MVP1
55525-54-7	urea, N,N'-bis[(5-isocyanato-1,3,3-trimethylcyclohexyl)methyl]-	MVP1*
56-55-3	benz[a]anthracene (PAH)	MVP1
603-35-0	fosphine, triphenyl-	MVP1*
608-93-5	pentachlorobenzene	MVP1*
7440-41-7	beryllium and its compounds	MVP1 5)
7486-35-3	tributyltin compounds	MVP1*
76-44-8	heptachlorine	MVP1*
76-87-9	fentin hydroxide	MVP1*
77-47-4	1,3-cyclopentadiene, 1,2,3,4,5,5-hexachloro-	MVP1*
789-02-6	DDT, 2,4'- isomer	MVP1*
793-24-8	1,4-benzenediamine, N-(1,3-dimethylbutyl)-N'-phenyl-	MVP1*
8001-35-2	Toxafene	MVP1*
85-22-3	benzene, pentabromo-ethyl-	MVP1*
85535-84-8	C10-13,aliphatic chloro-hydrocarbons	MVP1*
87-68-3	hexachlorobutadiene	MVP1*
87-86-5	Pentachlorophenol	MVP1*
91-59-8	2-naphtylamine	MVP1
91-94-1	[1,1'-biphenyl]-4,4'-diamine, 3,3'-dichloro-	MVP1

Overview of MVP 2 substances in NeR 2004

CAS number	Chemical name	Class
106-89-8	oxirane, chloromethyl- (epichlorohydrine)	MVP2 [1]
106-93-4	ethane, 1,2-dibromo-	MVP2 [2]
106-99-0	1,3-butadiene	MVP2 [2]
107-06-2	ethane, 1,2 dichloro	MVP2 [2]
107-13-1	2-propenenitril (acrylonitril)	MVP2 [2]
13463-39-3	nickel tetracarbonyl	MVP2
302-01-2	hydrazine	MVP2
64-67-5	diethyl sulfate ester	MVP2
71-43-2	benzene	MVP2 [4]
75-01-4	chloroethene (vinylchloride)	MVP2
75-21-8	oxirane (ethylene oxide)	MVP2
75-56-9	methyloxirane (propyleneoxide)	MVP2 [2]
77-78-1	dimethylsulfate	MVP2
79-46-9	2-nitropropane	MVP2

* For this substance, no emission requirement was yet included in the NeR or the substance was not mentioned as a separate substance in he NeR but was part of a group of substances.

[1] In 2004, the detection limit for measuring methods is 2 mg/m^3.

[2] For existing situations a concentration requirement of 5 mg/m^3 and a mass flow limit of 25 g/u apply until 2015.

[3] For existing situations it is possible on the basis of technical and economic considerations to allow a higher emission concentration than the MVP 1 requirement following a test of the environmental effects against the iVR.

[4] For existing situations, a concentration requirement of 5 mg/m^3 and a mass flow limit of 25 g/u apply until 2015. The Ministry of Housing, Spatial Planning and the Environment will make an effort to include, for specific sectors, deviating requirements for benzene in the BREFs and/or guidance notes of the BREFs.

[5] The MVP 1 requirement may be deviated from (up to maximally the old requirement of C.1: 0.1 mg/m^3) if the MVP 1 requirement is technically or economically unfeasible in specific situations.

[6] For chromium VI, an emission requirement of 0.1 mg/m^3 and a mass flow limit of 0.5 g/u apply for existing and new situations.

3.2.2 Emission standards for total particulate

The total particulate category has no mass flow limit under which no standards apply.

For the emission of particulate matter in a general sense (called S category), an emission standard of 5 mg/m$_o^3$ applies for an emission load of 0.2 kilogram or more per hour.

If it is not possible to use filtering separators, an emission standard of 20 mg/m$_o^3$ applies for an emission load of 0.2 kilogram or more per hour. Filtering separators mean cloth filters, laminated filters and other filter systems in which use is made of a medium through which the waste gas is passed.

If, due to specific waste gas parameters, it is impossible to use filtering separators, non-filtering dust control techniques may be used, such as electrostatic separators, wet dust collectors or rotating particulate separators.

Applicability of filtering separators

Use of filtering separators is not possible in all cases. A cloth filter can, for instance, slam shut due to sticky particulates or catch fire due to hot or reactive particulates.

Bottlenecks arise particularly in situations involving:

- high temperature from the waste gas
- sticky particulates, particulates with unfavourable hygroscopic properties
- high moisture content in the waste gas
- risk of volatile or chemically reactive particulates in the waste gas
- strongly variable conditions of the waste gas
- negative effects of the filter system on operational management

In practice, the separate occurrence of one of the effects mentioned can usually be overcome. If a number of the effects mentioned can occur simultaneously, the application of filtering separators is often no longer possible and non-filtering separators should be used.

Furthermore, there are situations in which it is impossible to realise a concentration below 5 mg/m^3 with filtering separators, for example, due to an unfavourable pre-load or due to very fine particulates. In those cases, a filtering separator must be used, but the general standard for particulates may be departed from on duly stated grounds.

In general, filtering separators can be used if the untreated mass flow (possibly after pre-treatment) meets the following conditions:

- temperature < 1000° C for ceramic filters
  < 280°C for cloth filters
  < 80°C for laminated filters
- relative humidity < 90°C
- particulate size (dp) > 0.1 µm

In that case, the filters must meet the following indicative specifications (NeR particulate study / Haskoning):

cloth load	1-2	m^3(m^2 x minute) for cloth filters
cloth load	1.3	m^3(m^2 x minute) for laminated filters
filter resistance	70–80	mbar for fine cloth filters
(on the cloth)	15–25	mbar for coarse cloth filters
	2.5	mbar for very coarse cloth filters
	40	mbar for laminated filters

bottlenecks for use:	*possible solution:*
hygroscopic dust	heating filter cloth material
stickiness	pre-coating filter cloth
explosion risk	explosion-safe design of filter

If it is necessary to pretreat the waste gas flow (e.g. cooling) in order to use filtering separators, it can have a negative effect on the cost effectiveness of the installation if the pre-treatment is not coupled to the emission control of other substances.

An emission standard of 50 mg/m_o^3 applies for an emission load less than 0.20 kilogram per hour. If filtering separators can be used on such small sources, much lower emissions are often realised in practice. Unless it is explicitly stated otherwise in a special regulation, 'particulates' mean solid floating particles; for this see §2.10. It concerns total particulates, that is to say, no distinction is made between particles with an aerodynamic diameter greater than 10 micrometre and those less than 10 micrometre (PM10).

3.2.3 Emission standards for inorganic substances

Inorganic substances are subdivided into particulate inorganic substances and gaseous or vaporous inorganic substances.

Particulate inorganic substances (Category sA)
In the case of particulate inorganic substances the cumulation rule applies and also the following considerations:

Class sA.1
In the case of an emission load of 0.25 gram per hour or more an emission standard of 0.05 mg/m_o^3 applies.

Class sA.2
In the case of an emission load of 2.5 gram per hour or more an emission standard of 0.5 mg/m_o^3 applies.

Class sA.3
In the case of an emission load of 10 gram per hour or more an emission standard of 5 mg/m_o^3 applies.

Filtering separators are deemed the best available control technology for the control of particulate inorganic substances in Class sA.3. In principle, these systems must be used as much as possible to control the emission of substances of Category sA.3. This also applies if other systems, such as non-filtering separators, could comply with the concentration standards.

If during the venting of waste gases physical conditions (pressure, temperature) occur resulting in the above-mentioned components to be present in substantial amounts in a vaporous or gaseous form, then the applicable concentrations must also be applied to the total of all particulate, gaseous and vaporous emissions. This does not apply if separate requirements are mentioned in the category gaseous and vaporous inorganic substances for the gaseous and vaporous emission concerned.

Respirable quartz
Silica (quartz) is released in many treatments of sand-containing material (sand-blasting of stone, cutting of concrete, grinding etc.). For respirable quartz, a low MAC value applies (0.075 mg/m^3). To achieve this value at the workplace, point suction is used near the source or a high ventilation rate. In the latter case, the extracted ventilation air always complies with the NeR emission requirement if the MAC value is complied with at the workplace. Monitoring by means of measuring the emission is then no longer necessary. If point suction is used near the source, the percentage of quartz and other silicates in the waste gas may be higher than the requirements. In that case, an end-of-pipe particulate separation and monitoring by means of measurements is necessary (see §3.7.2).

Classification of particulate inorganic substances
Particulate inorganic substances have been classified on the grounds of the MAC value into one of the 3 following classes:

Class	MAC value mg/m_0^3
sA.1	< 0.1
sA.2	≥ 0.1 and < 0.5
sA.3	≥ 0.5

If more than one MAC value applies to a group of substances, the lowest value will be the norm.
Although the classification system does not recognise an upper limit, substances which can be regarded as relatively non-hazardous may be considered as 'particulates'. These substances must then meet the requirements of the category 'particulates, general (S)'.
The following inorganic substances will not be counted as belonging to category sA.3 but to class S:

CAS number	*Substance*
[..]	Aluminium and its compounds
[..]	Borium and compounds in particulate form
[..]	Calcium compounds
[1305-78-8]	with the exception of calcium oxide
[7782-42-5]	Graphite
[..]	Magnesium compounds
[..]	Molybdenum and its compounds
[..]	Portland cement, Portland slag cement, Portland fly ash cement, blast-furnace cement*
[..]	Sand and other silicon compounds with the exception of crystalline and/or fibrous compounds
[13463-67-7]	Titanium dioxide
[..]	Zinc and its compounds
[13530-65-9]	with the exception of zinc chromate
[7646-85-7]	with the exception of zinc chloride (fume)

* The percentage of radioactivity in blast-furnace slag may not differ from the percentage of radioactivity in powder coal fly ash.
A description of the characteristics of different types of cement is available in the publication EN 197-1.

Classification of fibrous particulates
Fibre here will mean: a particle with a length in excess of 5 µm, a width of less than 3 µm and a length/width ratio of more than 3:1. (Guidelines of the Council of the European Communities dated 19 March 1987; 87/217/EEC).
Ceramic and slag wool fibres must be placed on a par with silica fibres as far as the hazard that they represent is concerned; they can therefore be classified as Class sA.1 substances.
In circles concerned with labour conditions the risk posed by glass and rock wool fibres is estimated a factor 5 lower (Working with glass and rock wool, Ministry of Social Services and Employment, 1991). For emissions of such fibres it is therefore acceptable to apply the regulation for substances of class sA.2.

Gaseous or vaporous inorganic substances (Category gA)

The cumulation rule does not apply to gaseous or vaporous inorganic substances. The following applies:

Class gA.1
An emission standard of 0.5 mg/m_o^3 applies to an emission load of 2.5 gram or more per hour per substance.

Class gA.2
An emission standard of 3.0 mg/m_o^3 applies to an emission load of 15 gram or more per hour per substance.

Class gA.3
An emission standard of 30 mg/m_o^3 applies to an emission load of 150 gram or more per hour per substance.

To control the emission of hydrochloric acid, the following applies for an emission load of 150 gram or more per hour:
- If the emission concentration in the untreated waste gas is less than 1 gram/m^3, an emission standard of 10 mg/m_o^3 applies.
- If the emission concentration in the untreated waste gas is greater than 1 gram/m^3, an emission standard of 30 mg/m_o^3 applies.

Reference oxygen content
For the substances in Class gA.4, the standards apply for incineration emissions involving 3% oxygen and for process emissions involving the usual oxygen percentage for normal process conditions, unless it is expressly stated otherwise in Special Regulations.

Classification of gaseous or vaporous inorganic substances (Category gA)
On the ground of the MAC value, the vaporous or gaseous inorganic substances are classified into one of three classes:

Class	MAC value mg/m_0^3
gA.1	< 0.5
gA.2	≥ 0.5 and < 3
gA.3	≥ 3

Hydrogen sulphide is classified into Class gA.2 on the ground of the low odour threshold value.

In anticipation of a formal classification, the regulation of Class gA.2 applies to emissions of sulphuric acid (7664-93-9) and phosphoric acid (7664-38-2 (mists) and Class gA.3 to nitric acid (7697-37-2) (mists).

Limitation of emission of hydrochloric acid
In special situations, for example, when a waste gas flow contains harmful components of different substance categories, a standard of 10 mg can be unfeasible for a pre-load of less than 1 g/m^3 as well. In such a case, the competent authority can depart from the general standard on duly stated grounds.

Cost effectiveness of ammonia reduction
Using measures in accordance with Best Available Control Technology, the emission of ammonia can be reduced to below 30 mg/m^3. For some sources, often with a biological origin, the ammonia emission can have a relatively low concentration (merely a little above the emission standard). In such a case, the cost effectiveness of the control measure can turn out to be unfavourable. In that case, the competent authority can depart from the general standards on duly stated ground.

The NeR advisory group endeavours to establish an indicative reference value for the cost effectiveness of ammonia reduction before the expiry of the realisation period referred to in §2.5.4. This can be taken into account upon making existing situations compliant.

Class gA.4
An emission standard of 50 mg/m_o^3 applies to an emission load of 2 kilogram or more per hour. In case the load of the emission before treatment is greater than 1 mg/m_o^3 and the emission limit value cannot be achieved with measures in accordance with Best Available Control Technology, the yield of the treatment installation used must be at least 95% and an emission standard of 200 mg/m_o^3 applies.

gA.4
For a high untreated load of SO2, the limit value can sometimes be difficult to achieve, particularly when it involves unfavourable side effects of the emission abatement measures. In that case, the concentration standard does not apply, but the treatment technique used must have a high yield. The treated emission may, in that case, never amount to 200 mg/m^3 (the standard in the NeR 2000). In practice, this means that, upon checking the emission limit value, the concentration in the untreated flue gas must also be determined.

Class gA.5
Emission abatement techniques must be applied in accordance with Best Available Control Technology for an emission load of 2 kg/hour or more.

Best Available Control Technology for abatement of NO_x emissions
The techniques for controlling NO_x emissions fall into two main groups:
- process-integrated measures
- end-of-pipe $DeNO_x$

There are many measures that are regarded as process-integrated measures. Relevant are:
- burner measures
- use of other fuel types
- oxy fuel burning
- water injection
- other process adjustments

The most important end-of-pipe techniques are:
- SNCR: selective non-catalytic reduction
- SCR: selective catalytic reduction
- biological $DeNO_x$

The performance of these techniques can vary widely, depending on the selected technique and the nature of the emission to be reduced. The following emission levels are generally feasible:
- process-integrated measures: 50 to 500 mg/m^3
- SNCR: 50 to 200 mg/m^3
- SCR: 50 to 100 mg/m^3

Here the rule is that the lowest level stated must be achieved at favourable process conditions and new installations and the highest level stated for measures to existing installations at unfavourable process conditions. The highest levels for process-integrated measures occur in processes with high temperatures and direct contact between flame and product (glass furnace, cement factory, ceramic processes).

For new installations, the ammonia emission can, in the case of both SCR and SNCR, be limited to below 5 mg/m_o^3. For existing SCR and SNCR installations, an NH3 emission of 5 mg/m_o^3 may be unfeasible upon optimisation of the NO_x emission. A higher value can than be permitted.

NO_x standards in combination with other NO_x policy
For controlling NO_x emissions, there are various policy instruments and several new instruments under development. In general, the NeR standards do no apply to situations in which other policy already applies (see §2.2). Furthermore, the competent authority must treat the NeR standards with reservation in situations in which new policy instruments are being developed. In such a case, a standard on the ground of the NeR would, for example, be outdated within several years. This applies, for instance, to NO_x standards for installations above 20 MW, which could become subject to the emission trade. Because the emission trade will start before the compliance deadlines are expired, no problem will arise for existing installations.
For new installations, one should, in any event, apply Best Available Control Technology, and standards must be set in accordance with Best Available Control Technology.

3.2.4 Emission standards for organic substances

In Appendix 4.5, organic substances (Category O) are classified into various classes: O.1 to O.3. The list of organic substances is not limitative and, if necessary, new substances can be added to it.

Volatile organic substances
Volatile organic substance means: an organic compound of anthropogenic nature with the exception of methane, which at 293.15 K has a vapour pressure of 0.01 kPa or more, or under specific use conditions, has a comparable volatility.
An organic compound is a compound that at least contains the element carbon and one or more of the following elements: hydrogen, halogen, oxygen, sulphur, phosphorus, silicon or nitrogen, with the exception of carbon oxides, inorganic carbonates and bicarbonates.

For various inorganic substances, the following emission standards apply. The cumulation rule also applies.

Class gO.1
An emission standard of 20 mg/m_o^3 applies for an emission load of 0.10 kilogram or more per hour.

Class gO.2
An emission standard of 50 mg/m_o^3 applies for an emission load of 0.5 kilogram or more per hour.

Class gO.3
An emission standard of 100 mg/m_o^3 applies for an emission load of 0.5 kilogram or more per hour.

Other VOC reduction policies

In the area of the reduction of solvents there are other policy instruments that have precedence over the NeR.

- On the ground of the European Solvents Directive, separate standards apply for emissions of organic substances in specific industrial processes. This is included in the Solvents Decree conversion of EU-VOC Directive (*Oplosmiddelenbesluit omzetting EU-VOS richtlijn*). These standards have precedence over the NeR. And overview of the activities that relate to this is given in §2.8.2.
- In addition, many industries formulate VOC reduction plans that are focused on 30% reduction in 2010. The competent authority must take this into account.
- Some BREFs contain measures to reduce VOC emissions. The enforcement notes of the BREF specify how to deal with this.

In addition to the general standards, special regulations apply or other arrangements in other policy frameworks for a number of activities where organic substances are released. These are included in §3.4. In §2.8.4.6 it is indicated in which way they must be applied.

Clarification of the concepts

(Suspected) carcinogen

See Appendix 4.8

MAC

Although the MAC value is established on other grounds besides health effects, the MAC value is, as yet, of particular importance in assessing the degree of environmental harmfulness.

The following classification can be used:

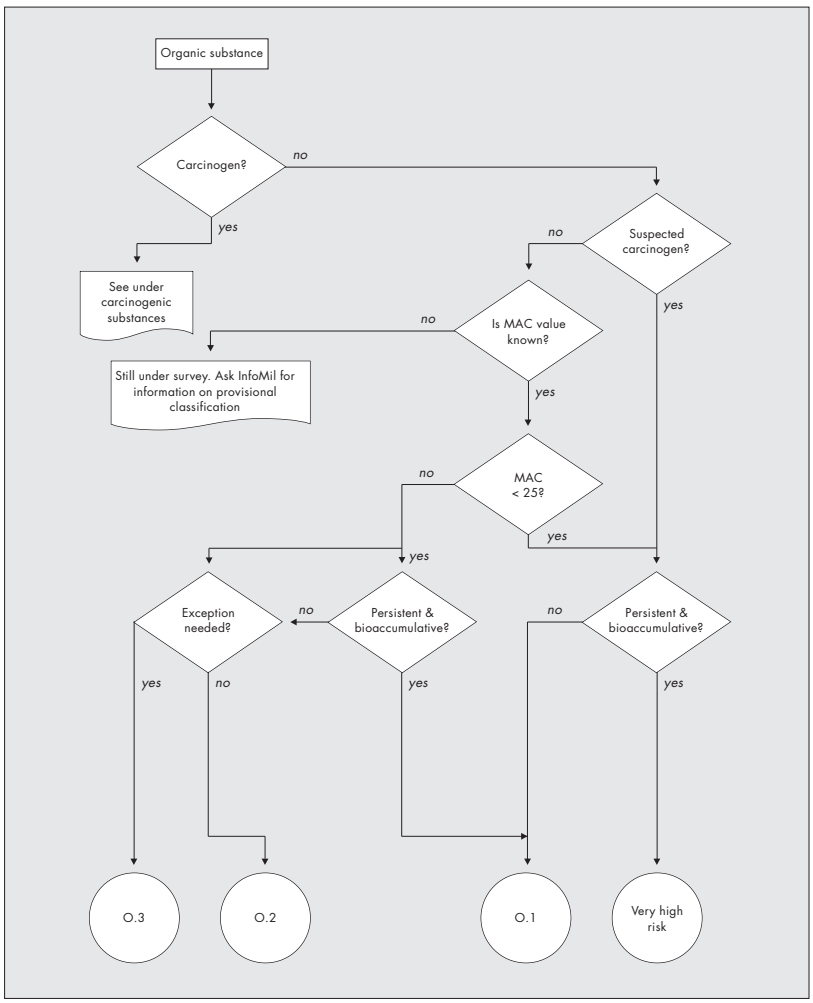
Class	Toxicity	MAC value (mg/m^3)
0.1	high	< 25
0.2	moderate	≥ 25

For the classification of organic substances for which no MAC value has been established, for the time being refer to InfoMil.

Very toxic, persistent and bioaccumulative

Organic substances with a very high risk for humans and the environment are classified into the group 'Very high risk substances' on the basis of toxicity, persistence and bioaccumulation. Examples of such substances are dioxins and PCBs.

Figure 1 Diagram of classification of organic substances



Bioaccumulation
When the logarithm of the partition coefficient log(Po, w) between n-octanol and water is greater than 2.7, the risk of bioaccumulation is assessed as being 'high'.

Persistence
To assess the persistence of a substance, it is necessary to first know the partition of an emitted substance and any reaction product over the three compartments air, water and soil. The partition can be determined using the Mackay model (re.: Mackay, P. and S. Paterson: Calculating fugacity, Environ. Sci. Technol. 15 (1981) S. 1006/1014).

If the substance in question occurs in substantial quantities in a particular compartment, or > 10% of the total, the degradation possibilities are taken into account in that compartment. In the air, the degradation of a substance will primarily take place chemically / physically (a-biotic) and, in water and soil, primarily biologically For the compartment air, a substance is deemed persistent when its half-life is greater than 10 days (t½ >10 days). For the compartments water and soil, a substance is deemed difficult to degrade if this is shown by a suitable 'Grundstufentest' in accordance with Appendix V of EC Directive 79/831/EWG.

Particulate organic substances

Class sO
An emission standard of 5 mg/m_o^3 applies for an emission load of 0.1 kilogram or more per hour. If it is not possible to use filtering separators, an emission standard of 20 mg/m_o^3 applies for an emission load of 0.1 kilogram or more per hour.

An emission standard of 50 mg/m_o^3 applies for an emission load less than 0.1 kilogram per hour.