

Recommendation on Best Available Techniques in the Chemical Pulping Industry

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The Commission,

recalling Paragraph 1 of Article 2 of the Danube River Protection Convention in which the Contracting Parties shall strive at achieving the goals of a sustainable and equitable water management, including the conservation, improvement and the rational use of surface waters and ground water in the catchment area as far as possible;

recalling also Paragraph 2 of Article 2 of the Danube River Protection Convention according to which the Contracting Parties pursuant to the provisions of this Convention shall cooperate on fundamental water management issues and take all appropriate legal, administrative and technical measures, to at least maintain and improve the current environmental and water quality conditions of the Danube River and of the waters in its catchment area and to prevent and reduce as far as possible adverse impacts and changes occurring or likely to be caused;

recalling further Paragraph 2 b of Article 5 of the Danube River Protection Convention in which the Contracting Parties shall separately or jointly adopt legal provisions providing for requirements including time limits to be met by waste water discharges;

recalling further Paragraph 1 of Article 7 of the Danube River Protection Convention in which the Contracting Parties taking into account the proposals from the International Commission shall set emission limits applicable to individual industrial sectors or industries in terms of pollution loads and concentrations and based in the best possible way on low- and non-waste technologies at source.

Where hazardous substances are discharged, the emission limits shall be based on the best available techniques for the abatement at source and/or for waste water purification;

recalling further Part 1 of Annex 1 of the Danube River Protection Convention in which best available techniques are defined;

recommends to the Contracting Parties of the Danube River Protection Convention that the following measures should be applied in the pulp industry (kraft pulp and sulphite pulp processing):

1. Technical In-Plant Measures for the Reduction of Waste Water Volume and Abatement of Pollution Load

Waste water should only be discharged if waste water volume and pollution load are minimised by in-plant measures using best available techniques, i.a.

- dry debarking of wood;
- optimised delignification before the bleach plant by extended or modified cooking (kraft and sulphite pulp) and additional oxygen stages (kraft pulp only);
- highly efficient brown stock washing and closed cycle brown stock screening;
- total chlorine free (TCF) bleaching (sulphite pulp); elemental chlorine free¹ (ECF) bleaching with low AOX or total chlorine free (TCF) bleaching (kraft pulp);
- effective spill monitoring, containment and recovery system;

¹ Processes using molecular chlorine

- for prevention of unnecessary loading and occasional upsets in the external effluent treatment process due to cooking and recovery liquors and highly polluted condensates sufficiently large buffer tanks for storage are considered necessary;
- recycling of some, mainly alkaline process water from the bleach plant (kraft pulp);
- stripping and reuse of the condensates from the evaporation plant (kraft pulp);
- provision of sufficient capacity of the black liquor evaporation plant and the recovery boiler to cope with the additional liquor and dry solids (kraft pulp);
- neutralising of weak liquor before evaporation followed by re-use of most condensate in the process or anaerobic treatment (sulphite pulp);
- reducing air emission, e. g. by efficient electrostatic precipitators for flue gases from recovery boilers, auxiliary boilers and lime kiln, control of NOX emissions by controlling the firing conditions, control of SO2 emissions from the recovery boilers by firing containing high concentrations of dry solids black liquor in the recovery boiler or by using a flue gas scrubber;
- minimised use of non-biodegradable chelating agents;
- minimised use of APEO-containing auxiliary agents.

2. Reduction of Pollution Loads

After implementation of relevant measures listed under 1., plants of pulp industry discharging to water bodies should meet the following requirements.

2.1. Kraft Pulping Industry

	COD (kg/t)	BOD (mg/l)	AOX (kg/t)
Bleached Pulp	30	30	0,25
Unbleached Pulp	20	30	< 0,1

All values are annual mean values in kg/Adt (Ad = Air dried pulp) except for BOD in mg/l. Assuming that cooling water and other clean waters are discharged separately a water demand of 30 - 50 m³/Adt is regarded as BAT. Unbleached kraft pulp needs 15 to 25 m³/Adt.

2.2. Sulphite Pulping Industry

	COD (kg/t)	BOD (mg/l)	AOX (kg/t)
Bleached Pulp	40	30	< 0,1

All values are annual mean values in kg/Adt (Ad = Air dried pulp) except for BOD in mg/l. Assuming that cooling water and other clean waters are discharged separately a water demand of 40 - 55 m³/Adt is regarded as BAT.

The values in 2.1 and 2.2 refer to the contribution of pulping only. In integrated (pulp and paper) mills emissions from papermaking have to be added according to the product mix.

2.3 Sampling and Analyses

Internationally accepted standardised sampling, analysing and quality assurance methods (e.g. CEN-standards, ISO-standards, DIN-standards and OECD-Guidelines) should be used whenever available.

BOD = BOD₅ = five-day biochemical oxygen demand consumption with suppression of nitrification.

COD = COD_{cr} = chemical oxygen demand consumption using the dichromate method.

Recommends also that this Recommendation should be implemented for new plants (starting operation after 1 January 2002) as from 1 January 2002 and for existing plants from 1 January 2006,

Recommends further that the Contracting Parties should report (see Annex 1) to the Commission on implementation of this Recommendation in 2003 and thereafter every three years.

Recommends further that the Contracting Parties should reconsider this Recommendation in 2006 especially regarding limit values for total phosphorus and nitrogen and the substitution of non-biodegradable chelating agents.

Reporting Format for Recommendation on Best Available Techniques in the Chemical Pulping Industry

Country: _____ Year: _____

The following data have to be reported for every plant of the chemical pulping industry that discharges into water bodies.

- 1) Name of the plant, its location and the river into which the discharge occurs.
- 2) Description of type of plant production capacity and production technology including the sequences of bleaching.
- 3) Waste water volume (m³/d, m³/a) and characterisation of waste water treatment.
- 4) Information on measures taken according to item 1. of the Recommendation.
- 5) Methods of sampling (grab to 24h-sampling) and analyses.
- 6) Effluent characteristics:

	Annual Specific Load (kg/t)	Annual Load (t/a)	Annual Mean Concentration (mg/l)
COD	–		
BOD	–		
AOX	–		
tot-N			
tot-P			
Chelating agents (e. g. EDTA, DTPA)	–		