

UL 2771

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Standard for Sustainability

Paper Products

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Standard for Sustainability for Paper Products, UL 2771

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INTRODUCTION

1 General

1.1 This Standard is designed to recognize and support continuing efforts to improve or maintain environmental metrics, by recognizing the ongoing efforts by manufacturers to minimize their consumption of energy and materials per unit of production.

1.2 This Standard was developed using a multi-parameter approach that identifies the most important environmental indicators from all stages of the product's life cycle.

1.3 This Standard is a republication of Ecologo Certification Criteria Document (CCD) 077, Paper Products. The criteria have been reformatted for consistency with the Style Manual for UL Standards.

2 Scope

2.1 This Standard includes all printing, office and fine papers, including wood-free, clay coated, and free sheet papers. It also includes newsprint.

2.2 This Standard explicitly excludes converted paper products, including envelopes, tags, continuous forms, labels, and bound materials. Moreover, this category does not include sanitary paper products.

2.3 For each of these environmental indicators identified, criteria have been devised with the goal to identify the top overall environmental performers on the market. These best performers have demonstrated that, compared to others on the market, they have an overall reduced potential burden on the environment per unit of production. Some of this reduced potential burden can be manifested in any of the following:

- a) Lower noxious emissions to water;
- b) Lower wastewater discharge levels;
- c) An efficient use of fiber through the use of recycled content;
- d) Lower solid waste volumes;
- e) A lower potential contribution to acid rain and climate change;
- f) A reduced amount of energy use;
- g) The adoption of best forestry practices and habitat conservation;
- h) Vehicle Cleaners; and
- i) Window and Glass Cleaners.

3 Units of Measurement

3.1 For the purposes of these requirements, values shall be reported in accordance with the requirements of the specific criteria and shall be in metric units. If a manufacturer's choice of units deviates, that change shall be documented and justified as to the reason and relevance for that change.

4 Undated References

4.1 Any undated reference to a code or standard appearing in the criteria of these requirements shall be interpreted as referring to the latest edition of that code or standard. The exception shall be in the case where the criterion explicitly states a certain version or date to be used.

5 Glossary

5.1 For the purpose of these requirements, the following definitions apply.

5.2 ACIDIFICATION POTENTIAL – A measure of the impact of emissions on potential acid rain formation. It is calculated using atmospheric emissions of sulphur dioxide (SO₂) and nitrogen oxide (NO_x) compounds. In Canada SO₂ is emitted by mills that use sulphur bearing coal and oil. For the purposes of this standard acidification potential is based on measured SO₂ emissions from the pulp and paper mill.

5.3 ADMT – Air-dried metric ton, where air-dried is 10% moisture content.

5.4 AGRICULTURAL FIBER – The fiber source from plants cultivated specifically for making paper (e.g., hemp, cotton, bamboo and straw) or the solid residues arising from the harvesting and processing of these agricultural crops which would otherwise be incinerated or sent to landfill as waste.

5.5 AS FUEL – When fuels are used to generate heat for the paper making process or for on-site mill use. Included in this category would be steam generation (excluding sales), building/air heating, lime kilns, and dryers.

5.6 CHEMICAL OXYGEN DEMAND (COD) – A measure of the amount of oxygen required to oxidize organic and oxidizable inorganic compounds in water. It measures the fraction of organic substances present in mill effluent that the natural environment cannot readily degrade. COD is measured by the Water quality – Determination of chemical oxygen demand, ISO 6060 test method, or by method 5220 C or D in "Standard Methods for the Examination of Water and Wastewater", 17th Edition, American Public Health Association, American Water Works Association and Water Pollution Control Federation, 1989, Washington, DC.

5.7 ELEMENTAL CHLORINE FREE (ECF) – A process that uses chlorine dioxide in the whitening process.

5.8 ECF WITH EXTENDED OR OXYGEN DELIGNIFICATION – A whitening process that removes more of the lignin from the wood before whitening, thus reducing energy and chemical use during this process. Chlorine dioxide is also used in the final stage of this process.

5.9 ECF WITH OZONE OR HYDROGEN PEROXIDE – A whitening process that removes more of the lignin from the wood before whitening, and that uses ozone or hydrogen peroxide as an agent in the initial stages and chlorine dioxide in the final or near-final stage of this whitening process.

5.10 EFFLUENT DISCHARGE – Water discharged from the waste treatment facility from the pulp and paper mill. For the purpose of this standard, the effluent discharge measure is an average of the discharges for the pulp mill and paper mill.

5.11 ENERGY USE – The energy used by a pulp and paper mill. For the purpose of this standard, the energy use calculation includes all uses of electricity and fuels.

5.12 FOREST STEWARDSHIP COUNCIL (FSC) – The independent, non-governmental, not-for-profit organization established in 1993 to promote the responsible management of the world's forests.

5.13 GLOBAL WARMING POTENTIAL (GWP) – The time-integrated change in radiative forcing due to the instantaneous release of 1 kilogram of a gas expressed relative to the radiative forcing from the release of 1 kilogram of CO₂. For the purpose of this standard, the greenhouse gas emissions measured are CO₂, CH₄ and N₂O from both pulp and paper mills.

5.14 IC₂₅ – Inhibiting concentration that will affect 25% of the test organisms.

5.15 ISO – International Organization for Standardization.

5.16 LANDFILLED AS WASTE – A method of disposing of solid mill waste by transporting it to a designated land area, dumping it into excavations and then applying a covering.

5.17 MEASURABLE CONCENTRATION OF 2, 3, 7, 8-TCDD – A concentration of 2, 3, 7, 8-TCDD that is greater than the level of quantification (15 ppq) when tested using one of the following methods:

a) Method 1613 Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS in Guidelines Establishing Test Procedures for the Analysis of Pollutants; US Environmental Protection Agency, October 1994; or

b) Report EPS 1/RM/19, Reference Method for the Determination of Polychlorinated Dibenzopara-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) in Pulp Mill Effluents, Environment Canada, 1991.

5.18 MEASURABLE CONCENTRATION 2, 3, 7, 8-TCDF – A concentration of 2, 3, 7, 8-TCDF that is greater than the level of quantification (15 ppq) and that when multiplied by 0.1, exceeds 5 ppb, when tested using one of the following methods:

a) Method 1613 Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS in Guidelines Establishing Test Procedures for the Analysis of Pollutants; US Environmental Protection Agency, October 1994; or

b) Report EPS 1/RM/19, Reference Method for the Determination of Polychlorinated Dibenzopara-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) in Pulp Mill Effluents, Environment Canada, 1991.

5.19 PROGRAMME FOR THE ENDORSEMENT OF FOREST CERTIFICATION (PEFC) – The international non-profit, non-governmental organization established in 1999 dedicated to promoting Sustainable Forest Management (SFM) through independent third-party certification.

5.20 PRE-CONSUMER (POST-INDUSTRIAL) MATERIAL – Material diverted from the waste stream during a manufacturing process that has never reached the end-user. Excluded is the reutilization of materials generated in a process and capable of being reused as a substitute for a raw material without being modified in any way.

5.21 POST-CONSUMER MATERIAL – Material that has reached its' intended end-user which is no longer being used for its' intended purpose.

5.22 POST-CONSUMER RECYCLED CONTENT – The proportion of the of post-consumer recycled material, by mass, in a product.

5.23 PROCESSED CHLORINE-FREE (PCF) – A whitening process that does not use chlorine or chlorine dioxide to whiten the raw fiber content in paper.

5.24 PULP – Fibrous material produced mechanically or chemically by reducing woody or agricultural plants into their component parts from which paper or paperboard sheets are formed.

5.25 RECYCLED CONTENT – The proportion of pre-consumer or post-consumer recycled material, by mass, in a product.

5.26 RAW FIBER – Wood or agricultural fiber which has not previously been pulped.

5.27 RECYCLED MATERIAL – Material that has been reprocessed from recovered (reclaimed) material by means of a manufacturing process and made into a final product or into a component for incorporation into a product.

5.28 SOLID WASTE – For the purpose of this Standard, only those amounts of solid waste (in m³/ADMT) that are landfilled as waste and incinerated without energy recovery by the pulp and paper mill.

5.29 SOUND ENVIRONMENTAL MANAGEMENT PRACTICES – Those practices and goals used to manage forest and/or agricultural products within a sound environmental management system that have the objectives of maintaining environmental values of the surrounding ecosystem.

5.30 SOUND ENVIRONMENTAL MANAGEMENT SYSTEM – A system, including inter alia the ISO 14000 series of standards, used to manage forest and/or agricultural products that incorporates sound environmental management practices. At a minimum, system elements shall include the following:

- a) Planning elements such as: identifying forest and/or agricultural resources; identifying environmental aspects; assessing environmental impacts; identifying environmental governmental policies, regulations and guidelines and committing to meeting or surpassing these within an adaptive management context; and defining and committing to environmental policies, objectives and targets;
- b) Operational elements such as: defining roles and assigning responsibilities; providing adequate staff training; communicating environmental aspects and policies both internally and externally; implementing an environmental management program based on identified environmental aspects and impacts; documenting all policies, goals and procedures; periodically reviewing and, where necessary, revising the system; performing public consultation and/or outreach; and establishing an environmental emergency preparedness and response plan; and
- c) Monitoring and measurement elements such as: monitoring and measuring key aspects of the system; evaluating and mitigating negative environmental impacts; correcting non-conformance with the management system; performing internal reviews; and having third party audits performed.

5.31 SPECIES DIVERSITY – A measure of the diversity within an ecological community that incorporates both species richness (the number of species in a community) and the evenness of species' abundances. Evenness measures the variation in the abundance of individuals per species within a community.

5.32 SUBLETHAL TOXICITY – The effects that a substance has on a test organism over a significant portion of the test organism's life (10% or more), such as growth, reproductive or metabolic inhibition.

5.33 TEF_{sub} – Sublethal Toxicity Equivalency Factor. It is calculated as $TEF_{sub} = [\log (100/IC_{25} \text{ mean})] \times [\text{annual mill effluent flow in m}^3] / [\text{annual mill tonnage in ADMT}]$. To determine the IC_{25} values, required tests are:

a) For freshwater receiving environments:

- 1) For invertebrate species: Environment Canada's Test of Reproduction and Survival Using the Cladoceran *Ceriodaphnia dubia* (Report EPS 1/RM/21 Second Edition), February 2007, or the US Environmental Protection Agency's Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (*Ceriodaphnia dubia*) (EPA-821-R02-013), 2002; and
- 2) For algal species: Environment Canada's Biological Test Method: Growth Inhibition Test Using a Freshwater Alga (Report EPS 1/RM/25 Second Edition), March 2007, or the Centre d'expertise en analyse environnementale du Québec's Détermination de l'inhibition de la croissance chez l'algue *Selenastrum capricornutum* (Reference Method MA 500-S. cap.2.0), September 1997, or the US Environmental Protection Agency's Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (*Selenastrum capricornutum*) (EPA-821-R02-013), 2002; or

b) For marine and estuarine receiving environments, the two required tests are:

- 1) For invertebrates, Environment Canada's Biological Test Method: Fertilization Assay Using Echinoids (Sea Urchins and Sand Dollars) (Report EPS 1/RM/27), December 1992, or U.S. Environmental Protection Agency's Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms (Sea Urchin) (Third Edition) (Reference Method EPA/821/R/02-014), October 2002; and
- 2) For algal species, the U.S. Environmental Protection Agency's Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms (*Champia parvula*) (Third Edition) (Reference Method EPA/821/R/02-014), October 2002.

5.34 TO PRODUCE ELECTRICITY – Those fuels used to generate electricity on-site at a pulp and paper mill (i.e., gas/steam turbines or back-up generators).

5.35 TO PRODUCE STEAM FOR SALE – Those fuels used to generate steam at a pulp and paper mill sold to third parties.

5.36 TOTALLY CHLORINE-FREE – Paper produced without fibers that were whitened using chlorine or chlorine dioxide.

5.37 TOXIC – Those Cat 1-3 chemicals that are acutely toxic to human health, those Cat 1, 1A and 1B reproductive toxicants, and those Cat 1 and 2 chemicals that are acutely toxic to aquatic environments according to the Globally Harmonized System of Classification and Labelling of Chemicals.

5.38 WATER INPUT – Water coming into the mill from inter alia wood and other raw fiber, ground water, surface water and/or recycling water.

5.39 WATER OUTPUT – Water leaving the mill in inter alia products, wood chips, evaporation losses from drying and/or hot pressing and/or otherwise, and energy generation.

COMPLIANCE EVALUATION

6 Product Specific Requirements

6.1 The paper product shall be manufactured from a pulp and paper making process such that the total of load points assessed for Recycled Content, Solid Waste, Global Warming Potential, Energy Use, Chemical Oxygen Demand, Sublethal Toxicity, Acidification Potential and Effluent Discharge does not exceed 8 (Load Point Determination, Section 8, contains the table for calculating Load Points, and the Method for Load Point Determination for Integrated and Non-integrated Mills, Section 9 – 18, contains the methodology for collecting data). Also, the amount of points per environmental indicator shall not exceed 3.

6.2 The paper product shall be manufactured such that if a whitening process is used:

- a) The fiber shall not have been whitened with elemental chlorine; and
- b) The effluent directly downstream of the whitening plant shall not contain a measurable concentration of 2, 3, 7, 8-TCDD or a measurable concentration of 2, 3, 7, 8-TCDF

6.3 The paper product shall be manufactured from agricultural or wood fibers that have been sourced from forestry or agricultural operations that have implemented a sound environmental management system and are adhering to sound environmental management practices for 100% of its activities. At minimum these practices shall contain the following elements:

- a) Sustainable harvest rates;
- b) The conservation of:
 - 1) Species at risk;
 - 2) Species diversity;
 - 3) Wildlife habitat;
 - 4) Soil;
 - 5) Water and aquatic ecosystems (e.g., wetlands, lake and river ecosystems); and
 - 6) Key landscape and ecosystem-level ecological functions and processes, including corridors where necessary to preserve these ecological components;

c) No use of World Health Organization Type 1A and 1B, chlorinated hydrocarbon pesticides, pesticides that are toxic, as well as pesticides banned by international agreement;

d) No use of genetically modified seeds; and

e) No new forestry or agricultural operations on natural forest lands or peatlands (i.e., that have not been previously modified for forestry or agricultural purposes except in very limited areas and timeframes when this will lead to long-term conservation benefits);

6.4 The product shall come from a pulp and paper mill that has a water management plan in place which outlines the following:

a) All water input and output quantities measured and not measured; and

b) All known emissions to water measured and not measured.

6.5 The product shall not be manufactured with bisphenol A.

7 Labeling Requirements

7.1 The product shall disclose the following to purchasers and consumers:

a) The forest or agricultural management system used (e.g., which certification);

b) The percentage of recycled and post-consumer recycled content in the product; and

c) The whitening process used according to this classification or equivalent:

1) ECF with extended or oxygen delignification;

2) ECF with ozone or hydrogen peroxide;

3) Elemental chlorine-free;

4) Processed chlorine-free (PCF); and/or

5) Totally chlorine-free (TCF).