



UL 100

Standard for Sustainability for Gypsum Boards and Panels

Standard for Sustainability for Gypsum Boards and Panels, UL 100

First Edition, Dated August 22, 2012

Summary of Topics

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Standard for Sustainability for Gypsum Boards and Panels

First Edition

August 22, 2012

This ANSI/UL Standard for Safety consists of the First Edition including revisions through October 10, 2016.

The most recent designation of ANSI/UL 100 as a Reaffirmed American National Standard (ANS) occurred on October 10, 2016. ANSI approval for a standard does not include the Cover Page, Transmittal Pages and Title Page.

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INTRODUCTION

1 General

1.1 For the majority of products going into buildings, no clear definition or standard exists to assess the sustainability of these products. The environmental impact caused by the manufacture and use of building and construction materials creates an opportunity to address such sustainability issues in this standard. This standard will address these issues within the category of gypsum board and panel products.

1.2 Gypsum board and panel products are fundamentally made of natural materials, yet the impacts of extraction through production and ultimate disposal are often left to a broad sweeping statement of sustainability without a true definition of what that means. There are various alternative constructions, materials, manufacturing practices and even disposal options that can minimize environmental burdens.

1.3 This standard provides a life cycle based approach to setting the criteria to be achieved. Starting with life cycle assessment and human health based evaluations; this standard reflects the major areas of impact and provides a criteria structure that will allow manufacturers to demonstrate that any product meeting this standard has made significant gains towards becoming sustainable.

2 Scope

2.1 This standard establishes multiple attribute sustainability requirements for gypsum board and panel products as defined in 5.18 – 5.20.

2.2 The criteria in this standard were developed based on the life cycle stages of gypsum boards and panels. Sustainability factors considered in this standard are: materials, energy, manufacturing and operations, health and environment, product performance, and product stewardship. Credit for innovations in these, or other factors not listed, is also addressed in this standard.

3 Units of Measurement

3.1 For the purposes of this standard, values shall be reported in accordance with the requirements of the specific criterion and shall be in U.S. customary units. Where measurements are to be reported on a per unit basis, the measurement is to be reported per 1000 square feet basis (MSF). 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 requirements of this standard 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 this standard, the following definitions apply.

5.2 ACCEPTABLE HAZARD PROFILE – A product that does not contain ingredients that pose hazards which are immediate and/or have lasting, irreversible impacts, or result in unavoidable prolonged exposure as defined in the Procedure for the Preparation of a Toxicological Assessment, ULE P 113.

5.3 ALTERNATIVE RESOURCES – Resources other than raw or virgin material, including but not limited to bio-based materials, recycled/reclaimed content.

5.4 BIOACCUMULATE – The ability of a chemical to accumulate within an organism over time. [Note – See Appendix D for additional information]

5.5 BIOPERSISTENT – A chemical or physical (fiber, particulate) toxicant that is not readily degraded in the environment or within the organism. [Note – See Appendix D for additional information]

5.6 CARCINOGEN – A chemical that can cause cancer in animals or humans. [Note – See Appendix D for additional information]

5.7 CHRONIC REFERENCE EXPOSURE LEVEL (CREL) – An airborne level of a substance that would pose no significant health risk to individuals indefinitely exposed to that level.

5.8 DEMATERIALIZATION – Reduction in the mass of materials used during production of a product.

5.9 DIVERSION RATIO – The remainder of one (1) minus the quotient of the mass of material sent to a landfill or incinerated without energy recovery divided by the total waste of dry finished goods produced in a one-year time period.

5.10 ELECTRICAL ENERGY – The ability of electric current to produce work, heat, light, or other forms of energy. It is measured in kilowatt hours. (*Reprinted from Department of Energy <http://www.eia.doe.gov/glossary/index.cfm>*)

5.11 ENDOCRINE DISRUPTOR – A chemical, such as environmental estrogen, that can interfere with the natural hormones found in an organism by mimicking an endogenous hormone.

5.12 ENVIRONMENTAL FATE – The processes by which chemicals move and are transformed in the environment. Environmental fate processes that should be addressed include: persistence in air, water, and soil; reactivity and degradation; migration in groundwater; removal from effluents by standard waste water treatment methods; and bioaccumulation in aquatic or terrestrial organisms. (*Reprinted from EPA <http://www.epa.gov/dfe/pubs/tools/ctsa/>*) [Note – See Appendix D for additional information]

5.13 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) – Part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects. (*Reprinted from Environmental management – Vocabulary, ISO 14050*)

5.14 FACING PAPER – Multi-ply paper liner to the faces of gypsum board and panels, encasing the gypsum plaster core, and giving gypsum board and panels most of its tensile strength.

5.15 FLUE-GAS DESULFURIZATION (FGD) GYPSUM – Synthetic gypsum produced in the desulfurization of flue gases from fossil fuel fired power stations and heating plants with the necessary quality and performance characteristics to be used in gypsum applications.

5.16 GLASS MAT FACING – Coated or uncoated glass mat facings which are partially or fully embedded within the gypsum core of glass mat gypsum panels.

5.17 GREENHOUSE GAS – Gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. *(Reprinted from Environmental management – Vocabulary, ISO 14050)*

5.18 GYPSUM – The mineral consisting primarily of fully hydrated calcium sulfate, $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ or calcium sulfate dihydrate.

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5.19 GYPSUM BOARD – The generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum with paper surfacing.

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5.20 GYPSUM PANEL PRODUCTS – The general name for a family of sheet products consisting essentially of gypsum.

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5.21 LIFE CYCLE IMPACT ASSESSMENT – Phase of life cycle assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts for a product system throughout the life cycle of the product. *(Reprinted from Environmental management – Vocabulary, ISO 14050)*

5.22 MASS LANDFILLED – Total solid waste that has been disposed of in any type of landfill governed by federal requirements over a period of one (1) year.

5.23 MICROBIAL RESISTANCE – The ability of a material to resist the growth of fungi, bacteria or other similar organisms.

5.24 NATURAL GYPSUM – Gypsum that is extracted from the ground as a virgin natural resource.

5.25 PER UNIT – Per 1000 square feet basis (MSF).

5.26 PHOSPHOGYPSUM – The primary byproduct of phosphate fertilizer production, contains trace amounts of radioactivity and has been banned from most uses in the United States by EPA.

5.27 POST-CONSUMER RECYCLED MATERIAL – Material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. (*© ISO. This material is reproduced from ISO 14021:1999 with permission of the American National Standards Institute (ANSI) on behalf of the International Organization for Standardization (ISO). All rights reserved.*)

Construction site scrap and facing paper from used newsprint are examples of post-consumer recycled materials.

5.28 PRE-CONSUMER RECYCLED MATERIAL – Material diverted from the waste stream during a manufacturing process having never reached the end user. Excluded is the reutilization of materials generated in a manufacturing process and capable of being reused as a substitute for raw material without being modified in any way. FGD gypsum is considered pre-consumer recycled material.

5.29 PRODUCT STEWARDSHIP – A principle that directs all participants involved in the life cycle of a product to take shared responsibility for the impacts to human health and the natural environment that result from the production, use and end-of-life management of the product. The greater the ability of a party to influence the life cycle impacts of a product, the greater the degree of that party's responsibility. The stakeholders typically include manufacturers, retailers, consumers, and government officials.

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

5.31 RENEWABLE ENERGY – Energy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include, but are not limited to, biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action.

This term is based on the definition of "Renewable energy resources" in the U.S. Energy Information Administration's Glossary available at <http://www.eia.gov/tools/glossary>.

5.32 RENEWABLE ENERGY CERTIFICATE (REC) – Is equivalent to 1000 kWh of Renewable Energy. A REC represents the property rights to the environmental, social, and other non-power qualities of renewable electricity generation. A REC, and its associated attributes and benefits, can be sold separately from the underlying physical electricity associated with a renewable-based generation source.

5.33 REPRODUCTIVE/DEVELOPMENTAL HAZARD – A chemical that can interfere with normal reproduction, mating through parturition (birth), of a species. A reproductive hazard may affect the reproductive organs of the male and/or female of a species. A developmental hazard is one that affects the developing organism and can cause a range of effects from fetal death to malformation of the offspring.

5.34 SYNTHETIC GYPSUM – A chemical product, consisting primarily of calcium sulfate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) resulting primarily from an industrial process.

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5.35 THERMAL ENERGY – Energy generated and measured by heat of any kind. The sun, ocean, and geothermal sources can all be sources of thermal energy.