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Standard Guide for Establishing a Recycle Program for Roof Coverings, Roofing Membrane, and Shingle Materials[1]

This standard is issued under the fixed designation D8013; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide provides information for the development of a program to reduce roof covering waste. The recycled roof coverings and any scrap roof cover materials may be reprocessed back into new roof coverings, into other roofing products, or into products other than roofing. This guide does not comment on the use or the inclusion of other recycled or recovered materials which may be used to increase the total amount of recycle material.

1.2 This guide addresses terminology, logistics, quality assurance, separation, or segregation in the recycling process of materials.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1079 Terminology Relating to Roofing and Waterproofing

D7209 Guide for Waste Reduction, Resource Recovery, and Use of Recycled Polymeric Materials and Products (Withdrawn 2015)[3]

2.2 *UL Standard:*[4]

UL 2809 Environmental Claim Validation Procedure for Recycled Content

2.3 *ICC Standard:*[5]

ICC International Building Code, current version

3. Terminology

3.1 *Definitions*—For definitions of roofing terms, see Terminology D1079. For definitions of recycling and recovery terms, see Guide D7209.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *bale, n*—waste that is compacted and secured as a bundle to facilitate handling, storage, and transportation.

3.2.2 *bulk box, n*—also known as bulk bin, skid box, tote box, or Gaylord, these are normally pallet size containers used for storing and shipping bulk quantities constructed of corrugated fiberboard, either double or triple walled.

3.2.3 *certificate of composition disclosure, n*—certificate describing certain properties of a recovered material from an external source, its formation and source, and the specific material shipment to which it applies.

3.2.3.1 *Discussion*—Examples of CCD information include polymer, molecular weight, percentage of inorganic material, contamination type and level, strength, modulus, impact and other mechanical properties; code or designation identifying the formulation and source information.

3.2.4 *chemical recycling, n*—processing of recovered material into a secondary raw material or product, with a significant change to the chemical structure of the material (such as cracking, gasification, and depolymerization), but excluding energy recovery or incineration.

3.2.5 *collection, n*—logistical process of moving waste from its source to a place where it can be recovered.

3.2.6 *contaminant, n*—unwanted substance or material defined according to the intended use.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

[4] Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, http://www.ul.com.

[5] Available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, http://www.iccsafe.org.

3.2.7 *fluff, n*—filament like by-product from recycling such as fiberglass or polyester reinforcement, felt backing, and similar materials.

3.2.8 *impurity, n*—see *contaminant*.

3.2.9 *landfill, n*—waste disposal site for the deposit of waste onto or into land under controlled or regulated conditions.

3.2.10 *mechanical recycling, n*—processing of recovered material into secondary raw material or products without significantly changing the chemical structure of the material.

3.2.11 *post-consumer material, n*—roof cover material, generated by the end users of products that has fulfilled its intended purpose or can no longer be used in its present state; this includes material returned from the distribution chain.

3.2.11.1 *Discussion*—Post-consumer material is part of the broader category of recovered material and may come from households or commercial, industrial, and institutional facilities in their role as end users of a product.

3.2.12 *pre-consumer material, n*—roof covering material that is rejected from the prime manufacturing process and which can be combined with virgin material for use in later production of roof membrane, but only after significant reprocessing.

3.2.12.1 *Discussion*—Historically, this material has been sent to the landfill. Most reinforced single ply roofing membrane scrap that is reprocessed back into the same product fits this definition.

3.2.13 *recovered material, n*—materials and by-products that have been separated, diverted, or removed from the solid waste stream.

3.2.14 *recovery, n*—processing of post-consumer and pre-consumer material for the original purpose or for other purposes including energy recovery.

3.2.15 *recycling, n*—processing of recovered material into secondary raw material or product, excluding energy recovery.

3.2.16 *reuse, n*—use of a product more than once in its original form.

3.2.16.1 *Discussion*—In view of the fact that a reused product has not been discarded, reuse does not constitute a recovery option.

3.2.17 *roof covering, n*—the covering applied to the roof for water resistance, fire classification, or appearance.

3.2.17.1 *Discussion*—The IBC 2012 uses the term roof covering to refer to a particular component of a roof covering system or roof assembly. The system or assembly includes the roof deck, vapor retarded, substrate or thermal barrier, insulation, and roof covering.

3.2.18 *roof covering recycling, n*—process by which roof covering materials or products that would otherwise become solid waste are collected, processed, and returned to use.

3.2.19 *roof covering waste, n*—any roof covering material or object that the holder discards, or intends to discard, or is required to discard.

3.2.20 *shredding, v*—any mechanical process by which recovered material is fragmented into irregular pieces of any dimension or shape.

3.2.21 *source reduction, n*—process that reduces the waste from any step, such as design, manufacturing, packaging, acquisition, and provision for reuse of material.

3.2.22 *waste, n*—any substance or object that the holder discards or intends or is required to discard.

4. Significance and Use

4.1 This guide is intended to be used by roof covering manufacturers to develop protocol for waste reduction and resource recovery in the field, by initiating a recycling program of the roof covering. The roof coverings should be sent to a facility where the material can be processed by chemical recycling, mechanical recycling, or other accepted methods, and shipped to the roof covering manufacturer to be included into the production of new roof coverings. An alternative is to have the reprocessed material sent to other manufacturers or production facilities to be incorporated into new products aside from those used in roofing. This guide does not include roof cover waste to energy.

5. Classifications

5.1 *Class 1*—The post-consumer or the pre-consumer roof covering, or both, is reprocessed such that the recovered material can be added to processing or manufacturing a new roof covering.

5.2 *Class 2*—The post-consumer or pre-consumer roof covering, or both, is reprocessed such that the recovered material can be added to processing or manufacturing new roofing products other than a new roof covering. Examples may include walkway pads, protection layers, etc.

5.3 *Class 3*—The post-consumer or pre-consumer roof covering, or both, is reprocessed such that the recovered material can be added to products other than roofing products.

6. Certification of Recovered Materials

6.1 To ensure the quality and consistency of the recovered materials, a Certificate of Composition Disclosure (CCD) of the existing roof covering should be provided by the designated party, as assigned in the project specifications, to the receiver prior to recycling. The certificate should at a minimum identify the project location, size (estimated pounds) of the roof covering, type of roof covering, original supplier if possible, age, method of how the product was installed, and how the recovered material will be packaged and shipped.

6.2 To ensure the quality and consistency of the recovered materials, a CCD of the recovered material should be provided from the firm providing the recycled material to the manufacturer of the roof covering and roofing products. The certificate may include the information from the initial CCD as well as the general composition of the material and any specific specifications or requirements from the end user (manufacturer).

6.3 The new product manufacturer should record the CCD upon receiving and accepting the recycled material. For tracking and auditing purposes, the manufacturer should record the type and name, the day(s) of production, or lot numbers of the finished product(s) that include the recovered material.

7. Procedures for Recycling Recovered Roof Covering Material

NOTE 1—The following paragraphs are a list of tasks and action items that should be assigned to the project team members and completed. The following statements offer suggestions as to the most appropriate parties to be assigned and complete the tasks. These roles and responsibilities can be reassigned on a project or recycling specific basis, where mutually agreed upon by the involved parties.

7.1 When a project is identified as a candidate for recycling the roof covering, the owner or specifier along with the new roof covering supplier may identify the type of existing roof covering (for example, asphalt, type of modified bitumen (SBS, APP), type of single ply (EPDM, PVC, TPO), etc.), how it is installed (adhered, mechanically attached, loose-laid ballasted), and decide on the recycled classification.

7.2 The owner, designer, or tear off recycler should complete the CCD of the existing roof cover, providing a copy to the roofing contractor and the new roof cover manufacturer.

7.3 The project specification should instruct the roof covering manufacturer or recycler to coordinate with the roofing contractor on the logistics for removal, collecting, and packaging of the roof cover for shipment.

7.3.1 For flexible roof coverings, such as single-ply roofing, the existing roof covering should be cut into agreed-upon manageable sizes, as an example for larger roll roof coverings: approximately one meter wide (39 in.) by approximately 15 m (50 ft) long sheets. These sheets may be rolled up and secured with strings or other acceptable methods and placed in a bulk box. The bulk box should be on a pallet. The recycler's requirements for packaging should be followed.

7.3.2 For roof coverings that cannot be rolled, cut the roof covering into sections that can fit on pallets. A suggestion is to use the pallets that the new material is shipped on to stack and ship the removed roof covering.

7.3.3 The removed roof covering should be free from contaminants such as fasteners, plates, or any foreign matter (stones, trash, etc.). Pre-consumer roof covering trimmings may be added to the packaged post-consumer roof cover.

7.3.4 Material should be packaged for shipment in an economical method agreed upon between the removing company and the recycler.

NOTE 2—For a thermoplastic roof cover each container or pallet may have approximately 227 kg (500 lb) of old roof covering. Under ideal conditions, the bulk box can hold approximately 770 kg (1700 lb), which is approximately 370 m^2 (4000 ft^2) depending on the composition of the roof covering materials.

7.3.5 Materials should be protected from the elements according to the method agreed upon between the removing company and the recycler.

7.3.6 As agreed upon in the specification and project requirements, notification should be given by the entity packaging the pre- and post-consumer material that the materials are ready for shipment to the responsible party for coordinating the shipping of the containers, along with the CCD of the existing roof covering to the processing facility.

7.4 The processing facility receives the old roof covering and verifies it is the correct material. The material should be cleaned as required by the recycler for its process, prior to processing. The material is inspected for any forms of foreign materials, such as non-compatible patches.

7.4.1 If the old roof cover was reinforced either internally or externally (typically with polyester fibers or fabric, fiberglass mat, or scrims), this material should be removed from the process, designated as fluff, and is baled and sent out to other users. The processed roof cover is now converted to a usable size as required by the new manufacturer and screened to remove any residual fibers or contaminants.

7.4.2 The processing facility should provide a CCD of the recovered material following processing to the new material manufacturer. The certificate should include the information from the initial CCD as well as general composition of the material and any specific specifications or requirements from the end user (manufacturer).

7.4.3 The recovered material is then shipped to the new material manufacturer for processing as part of a new roof covering (Class 1) or processing as part of new roofing products (Class 2).

8. Additional Certifications

8.1 The roof covering manufacturer may use the information and data collected from this procedure as evidence in achieving third-party certification, such as UL ECVP 2809 for the percent recycled content for new manufactured products.

9. Keywords

9.1 material reuse; recycling; roof reclamation