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NSF/ANSI/3-A SSI 14159-3-2014

Hygiene Requirements for the
Design of Mechanical Belt Conveyors
Used in Meat and Poultry Processing



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American National Standard
for Food Processing Equipment —

Hygiene requirements for the design of mechanical belt conveyors used in meat and poultry processing

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Foreword²

The purpose of this Standard is to establish minimum public health and sanitation requirements for mechanical belt conveyors used in meat and poultry processing.

This edition of the Standard includes the following revision:

Issue 3 - updated the language regarding cleaning and inspection in Section 5.2.2 and added a supporting definition for the term "Clean out of place (COP)."

Issue 6 - As required by ANSI, Standards must be reviewed at least every five years. In accordance with this requirement, the Joint Committee updated the normative references and the boiler plate language within the Standard.

This Standard was developed by the NSF Joint Committee on Food Processing Equipment using the consensus process described by the American National Standards Institute. During the development of NSF/ANSI/3-A SSI 14159-1 it was determined by the Joint Committee that the sanitary design and construction requirements for mechanical belt conveyors should be included in a separate standard so as to not cause confusion with the requirements for general processing equipment.

Suggestions for improvement of this Standard are welcome. This Standard is maintained on a Continuous Maintenance schedule and can be opened for comment at any time. Comments should be sent to Chair, Joint Committee on Food Processing Equipment at standards@nsf.org, or c/o NSF International, Standards Department, PO Box 130140, Ann Arbor, Michigan 48113-0140, USA.

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NSF/ANSI/3-A SSI Standard 14159-3 For Food Processing Equipment —

Hygiene requirements for the design of mechanical belt conveyors used in meat and poultry processing

1 General

1.1 Purpose

This American National Standard establishes minimum food protection and sanitation requirements for the materials, design, fabrication, construction, and performance of meat and poultry processing equipment. This Standard does not contain operator safety requirements.

1.2 Scope

This American National Standard applies to exposed product mechanical belt conveyors, either singularly or as a component of equipment, intended for use in the slaughter, processing, and packaging of meat and poultry products.

1.3 Measurement

Decimal and Metric (SI) conversions provided parenthetically shall be considered equivalent. Metric conversions have been made according to IEEE/ASTM SI 10.

2 Normative references

The following documents contain provisions that, through reference, constitute provisions of this NSF/ANSI/3-A SSI Standard. At the time of publication, the editions indicated were valid. All referenced documents are subject to revision, and parties are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

3-A Accepted Practice, No. 604-05 2004. *Supplying air under pressure in contact with milk, milk products, and product contact surfaces*³

ANSI/ASME B46.1 – 2009, *Surface texture (surface roughness, waviness and lay)*⁴

Code of Federal Regulations, Title 21, (21 CFR) Parts 170-199. *Food and Drugs*⁵

Federal Food, Drug, and Cosmetic Act of 1938, as amended⁵

³ 3-A SSI, 1451 Dolley Madison Boulevard, McLean, VA 22101-3850 www.3-a.org

⁴ American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016-5990 www.asme.org

⁵ Superintendent of Documents, U.S. Government Printing Office, Mailstop SSOP, Washington, DC 20402-0001 www.gpo.gov

IEEE/ASTM SI 10-2002. *Standard for the Use of the International System of Units (SI): The Modern Metric System*⁶

NSF/ANSI/3-A SSI 14159-1. *Hygiene requirements for the design of meat and poultry processing equipment*

3 Definitions

For the purposes of this Standard, the following definitions apply.

3.1 associated equipment: All appurtenances associated with a piece of equipment, not defined as equipment, that are essential to the functioning of the equipment for it to hygienically process a product (e.g., fittings, piping, tubing).

3.2 bond: The adhesive or cohesive forces holding materials together. This definition excludes press-fits and shrink-fits.

3.3 cleaned in place: Cleaning of equipment by impingement or circulation of flowing chemical solutions, cleaning liquids, and water rinses, without dismantling, into, onto, and over surfaces in equipment or systems designed for this specific purpose.

3.4 clean out of place (COP): Removal of soil when the equipment is partially or totally disassembled. Soil removal is effected by circulating chemical solutions and water rinses in a wash tank, which may be fitted with circulating pump(s), or by use of manual or hand washing methods.

3.5 cleaning: Removal of soil.

3.6 coating: The results of a process where a different material is deposited to create a new surface. There is appreciable, typically more than 40 μ in (1 μ m), build-up of new material. The coating material does not alter the physical properties of the substrate. Coating processes include, but are not limited to: chemical (conversion coatings), engineering plating (e.g., electrodeposition), thermal spraying (e.g., flame, plasma, arc spray), physical vapor deposition, chemical vapor deposition, and overlays and encapsulation.

3.7 corrosion resistant: Capable of maintaining original surface characteristics under prolonged contact with the intended end use environment, and the normal use of cleaning compounds and sanitizing solutions.

3.8 crevice: A sharp, cleft-like, irregular opening of small depth that adversely affects cleanability.

3.9 dead space: Space wherein product, cleaning or sanitizing agents, or soils can be trapped, retained, or not completely removed during the operation of cleaning.

3.10 easily accessible: A location that can be reached by an employee from the floor, other permanent work area, or other stable (permanent or movable) platform.

3.11 easily removable: Capable of being detached and taken away from the parent unit without or with the use of simple hand tools.

3.12 equipment: An assembly of parts or components, with the appropriate actuators, controls, and power circuits, joined together for a specific application, in particular for the processing, treatment, moving, or packaging of product.

3.13 hygiene: The taking of all measures during product handling, preparation, and processing to ensure its suitability for use by humans.

⁶ ASTM International, 100 Barr Harbor Dr., West Conshohocken, PA 19428 www.astm.org

3.14 inspectable: Designed such that all product contact surfaces can be made available for close visual observation.

3.15 joint: Junction of two or more pieces of material.

3.16 manual cleaning: Removal of soil by various methods that are manipulated by hand when equipment is open or partially or totally disassembled.

3.17 microorganism (relevant): Bacteria, fungi, yeasts, molds, spores, and viruses that are able to contaminate, multiply, or survive in a product and are able to be harmful.

3.18 non-absorbent materials: Those materials that under the intended conditions of their use do not retain substances with which they come in contact.

3.19 non-product contact surface: The exposed equipment surfaces that are not in contact with the product and from which product or other materials cannot drain, drip, diffuse, or be drawn (self-returned) into the product or product container

3.20 nontoxic materials: Substances that, under the conditions of their use, are in compliance with applicable requirements of the Food, Drug, and Cosmetic Act of 1938, as amended.

3.21 practical test: Activities performed following a documented set of procedures and parameters used to determine an evaluation.

3.22 product: Any substance intended for human consumption (e.g., by ingestion, injection, topical application, insertion).

3.23 product contact surface: Equipment surfaces that are exposed to the product and from which the product or other materials can drain, drip, diffuse, or be drawn (self-returned) into the product or product container.

3.24 sanitization: The application of cumulative heat, chemicals, or other approved agents on clean surfaces that is sufficient to reduce the population of disease organisms by at least 99.999% (5 log reduction).

3.25 seal: To close an aperture so as to effectively prevent the entry or passage of unwanted matter.

3.26 self-draining: The combination of design, construction, installation, and surface finish so as to prevent the retention of liquid except for normal surface wetting.

3.27 sensors: Devices or instrumentation attached to equipment for process monitoring/control.

3.28 smooth: The condition of a surface that satisfies hygienic requirements and is free of pits, pinholes, cracks, crevices, inclusions, rough edges, and other surface imperfections detectable by visual and tactile inspection.

3.29 soil: Any unwanted matter.

3.30 surface treatment: The results of a process whereby chemical compositions or mechanical properties of the existing surface are altered. There is no appreciable, typically less than 40 μ in (1 μ m), build-up of new material or removal of existing material. Surface treatments include, but are not limited to, mechanical (shot peening, glass beading, polishing), thermal (surface hardening laser, electron beam), diffusion (carburizing, nitriding), chemical (etching, oxidation), ion implantation, or electropolishing.