ANSI / SPI B151.31-2014

American National Standard for Plastics Machinery

Safety Requirements for the Manufacture and Use of Blow Molding Machines

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Foreword
(This Foreword is not a normative part of American National Standard ANSI/SPI B151.31-2014.)

This standard is a merger of two prior American National Standards; ANSI/SPI B151.15 (Extrusion Blow Molding Machines - Safety Requirements for Manufacture, Care, and Use) and ANSI/SPI B151.21 (Injection Blow Molding Machines - Safety Requirements for Manufacture, Care, and Use). These standards have been merged, revised and re-designated ANSI/SPI B151.31- 2014; Safety Requirements for the Manufacture and Use of Blow Molding Machines. These standards were revised and merged because:

1) The scope needed to be expanded and the title modified;
2) Some illustrations required modification to conform to the text and some illustrations were deleted to permit design freedom;
3) Additional definitions were required;
4) Some paragraphs required modification and some paragraphs were added to conform more closely with changes in technology;
5) Some paragraphs required modification for clarity and intent.

The project on safety requirements for the manufacture, care, and use of blow molding machines was initiated under the auspices of the Injection Blow Molding Section of the Machinery Division, and the Safety Committee of the Molders Management Division, of the Society of the Plastics Industry, Inc. (SPI).

Both divisions of the SPI have long been concerned with operator safety on plastics processing equipment. Accordingly, each section of the divisions has established a standards development committee charged with the task of establishing necessary standards.

A standard treating the manufacture, care, and use of injection molding machines is complicated by the wide variety and sizes of machines manufactured and in use, and by the virtually infinite combinations of parts being produced, the production methods used, and the operating conditions existing in industry today.

The primary objective of this standard is to minimize hazards to personnel associated with machine activity by establishing requirements for the manufacture, care, and use of these machines. To accomplish this objective, the committee decided to approach the problem of machine safety from two directions:

1) Eliminating by design certain recognized hazards and establishing standard approaches to design so that machines available from competitive suppliers will have similar operational characteristics
2) Safeguarding the machine to protect personnel from recognized hazards

To assist in the interpretation of these requirements, responsibilities have been assigned to the supplier, the remanufacturer, the modifier, and the user.

Effective Date
The following information on effective dates is informative guidance only, and not a normative part of this standard. This committee recognizes that some period of time after the approval date on the title page of this document is necessary for suppliers and users to develop new designs, or modify existing designs or manufacturing processes in order to incorporate the new or revised requirements of this standard into their product development or production system.

This committee recommends that suppliers complete and implement design changes for new machines and machinery systems within 12 months of the approval of this standard.
The committee recommends that users evaluate whether existing machinery and machinery systems have acceptable risk within 36 months of the approval date of this standard using generally recognized risk assessment methods. If the risk assessment shows that modification(s) is necessary, refer to the requirements of this standard or the machine-specific (C-level) standard to implement risk reduction measures (protective measures) for appropriate risk reduction.

The ANSI/SPI B151.31 is considered a “type-C” standard. SPI standards can be associated with the ISO “A-B-C level” structure as described below:

- **Type-A standards** (basis standards) give basic concepts, principles for design, and general aspects that can be applied to machinery (e.g., ANSI B11.0; ANSI/ISO 12100);
- **Type-B standards** (generic safety standards) deal with one or more safety aspects or one or more types of safeguards that can be used across a wide range of machinery (e.g., ANSI B11.19; ISO 13849-1);
- **Type-C standards** (machinery safety standards) deal with detailed safety requirements for a particular machine or group of machines.

Suggestions for improvement of this standard will be welcome. They should be sent to the SSPI: The Plastics Industry Trade Association, 1667 K Street, NW, Suite 1000, Washington, DC 20006-1620

Consensus for this standard was achieved by use of the Canvass Method.

The Blow Molding Safety Committee of the Equipment Council, The Society of the Plastics Industry, Inc, which was responsible for this standard, had the following members:

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Secretariat to the Committee: Jackie Dalzell, The Society of the Plastics Industry, Inc.
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This ANSI/SPI B151.31 – 2014 American National Standard uses a two-column format to provide supporting information for requirements. The material in the left column is confined to “Standards Requirements” only, and is so captioned. The right column, captioned "Explanatory Information" contains information that the writing committee believed would help clarify the requirements of the standard or to provide examples or additional reference information. This column is not a normative part of the standard as it contains no requirements and should not be construed as being a part of the requirements of this American National Standard.

As in all American National Standards, the term “SHALL” denotes a requirement that is to be strictly followed in order to conform to this standard; no deviation is permitted. The term “SHOULD” denotes a recommendation, a practice or condition among several alternatives, or a preferred method or course of action.

Similarly, the term “CAN” denotes a possibility, ability or capability, whether physical or causal, and the term “MAY” denotes a permissible course of action within the limits of the standard.

To achieve uniform interpretation, it is imperative to read and understand the definitions (clause 3) of this standard.

**B151 conventions:** Operating rules (safe practices) are not included in either column of this standard unless they are of such nature as to be vital safety requirements, equal in weight to other requirements, or guides to assist in compliance with the standard. The Annex includes common procedures practiced on plastics machinery. This is considered “Explanatory Information” and is supplementary to the standard. The B151 standards generally do not use the term “and/or” but instead, the term “OR” is used as an inclusive disjunction, meaning **one or the other or both.**

Suggestions for improvement of this standard are welcomed. They should be sent to:
SPI: The Plastics Trade Industry Association
1667 K Street NW, Suite 1000
Washington, DC 20006 - Attention: B151 Secretariat.
1 Scope, purpose, application and installation

1.1 Scope
The requirements of this standard shall apply to the manufacture and use of all Blow Molding Machines (BMMs) that process plastic materials to:

- blow a parison;
- blow a preform (including injection blow, injection stretch blow, and reheat & blow) into the shape of a mold cavity held together by a vertically or horizontally acting clamp(s).

BMM suppliers and users shall use the risk assessment process in the manufacture, care, and use of the machinery.

Deviations from the requirements of this standard shall be based on a documented risk assessment.

Safety requirements for the manufacture or use of ancillary equipment for BMMs are not covered by this standard.

E1.1 This includes:
- extrusion blow molding machines;
- injection stretch blow molding machines;
- injection blow molding machines;
- reheat & blow molding machines.

In developing the requirements of this standard, the committee used the risk assessment process. A list of hazards typical of BMMs appears in clause 6. For each hazard identified, the committee assessed the potential severity of injury related to the hazard, the frequency of exposure to the hazard, and possible avoidance. This process involved discussion among the committee, and resulted in the recommended risk reduction measures included in clauses 7 through 10. Compliance with this standard is considered to adequately control hazards identified in clause 6. Other hazards not listed in clause 6 that can occur with BMMs should be evaluated using the risk assessment process and may require additional risk reduction measures not included in this standard.

See ANSI B11.0 or ANSI/PMMI B155.1 for additional information on the risk assessment process.

1.2 Purpose
The purpose of this standard is to identify and address known hazards to personnel working on, or adjacent to, Blow Molding Machines.