

ANSI/PLASTICS B151.20-2013 (R2018)

American National Standard for Plastics Machinery

Safety Requirements for Plastic Sheet Production Machinery

Secretariat and Accredited Standards Developer
Plastics Industry Association
1425 K Street, NW, Suite 500
Washington, DC 20005

Approved: February 27, 2019



COPYRIGHT PROTECTED DOCUMENT

Copyright © 2018 by PLASTICS

All rights reserved. Printed in the United States of America

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of PLASTICS.



BETTER INDUSTRY. BETTER WORLD.

PREFACE TO AMERICAN NATIONAL STANDARD B151.20

The information contained in this Preface is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Preface may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the standard.

By approving this American National Standard, the ANSI Board of Standards Review confirms that the requirements for due process, consensus, balance and openness have been met by the Plastics Industry Association (aka PLASTICS), the ANSI-accredited standards developing organization.

American National Standards are developed through a consensus process. Consensus is established when substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward resolution. This process brings together volunteers or seeks out the views of persons who have an interest in the topic covered by this publication. While the Plastics Industry Association administers the developmental process and establishes procedures to promote fairness in the development of consensus, it does not write the document and it does not independently test, evaluate or verify the accuracy or completeness of any information or the soundness of any judgments contained in its standards or guidelines.

American National Standards are promulgated through ANSI for voluntary use; their existence does not in any respect preclude anyone, whether they have approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards. However, users, distributors, regulatory bodies, certification agencies and others concerned may apply American National Standards as mandatory requirements in commerce and industry.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of an American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the Secretariat (PLASTICS).

Neither the Plastics Industry Association nor any of the organizations or individuals that assisted in authoring, developing, editing or distributing this standard (the Plastics Industry Association and such organizations and individuals collectively referred to as the "Contributing Parties") makes any warranty, either expressed or implied, as to the fitness of merchantability or accuracy of the information contained within this standard. The Contributing Parties disclaim and make no warranty that the information in this document will fulfill any of your particular purposes or needs. The Contributing Parties disclaim liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, application or reliance on this document. The Contributing Parties do not undertake to guarantee the performance of any individual manufacturer or seller's products or services by virtue of this standard or guide, nor does it take any position with respect to the validity of any patent rights asserted in connection with the items which are mentioned in or are the subject of this document. The Contributing Parties disclaim liability for the infringement of any patent resulting from the use of or reliance on this document. Users of this document are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

In publishing or making this document available, the Contributing Parties are not undertaking to render professional or other services for or on behalf of any person or entity, nor are the Contributing Parties undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment, or as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances. In addition to conforming to the requirements of this standard,

the responsible personnel must also make an independent determination as to whether a machine, activity or condition complies with the applicable legal requirements in the relevant jurisdiction(s).

The Plastics Industry Association has no power, nor does it undertake, to police or enforce conformance to the requirements of this voluntary standard. The Plastics Industry Association does not certify, test or inspect products, designs, or installations under this standard for safety or health purposes. Any certification or other statement of conformance to any health or safety-related information in this document shall not be attributable to the Plastics Industry Association and is solely the responsibility of the certifier or maker of the statement.

NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. You may contact the Secretariat for current status information on this standard.

Individuals interested in obtaining up-to-date information on standards can access this information at www.nssn.org (or by contacting ANSI). NSSN - A National Resource for Global Standards provides a central point to search for standards information from worldwide sources and can connect those who seek standards to those who supply them.

Published by:

Plastics Industry Association (PLASTICS)
1425 K Street NW, Suite 500
Washington, DC 20005

Copyright © 2018 by PLASTICS

All rights reserved. Printed in the United States of America

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Foreword

(This Foreword is not a normative part of American National Standard ANSI/PLASTICS B151.20)

This standard is a revision of American National Standard ANSI/PLASTICS B151.20-1999: *Requirements for the Manufacture, Care, and Use of Plastic Sheet Production Machinery*. The standard was revised because:

- some paragraphs required modification for clarity and intent;
- additional explanatory material and illustrations were added;
- additional definitions were required;
- some paragraphs required modification and some paragraphs were added to conform more closely to changes in technology.

PLASTICS has long been concerned with operator safety on plastics processing equipment. Accordingly, the organization has established a standards development committee charged with the task of establishing necessary standards. The project on requirements for the manufacture, care, and use of plastic sheet production machinery was initiated under the auspices of the Extrusion Safety Committee of the Equipment Council of the Society of the Plastics Industry, Inc. (SPI) (now the Plastics Industry Association).

A standard treating the manufacture, care, and use of plastic sheet production machinery 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 as follows:

The committee developed a list of hazards common to Plastic Sheet Production Machinery and listed these in clause 6 of this standard. For each hazard identified within the scope of the standard, 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 inclusive and additional Annex reference material. 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 Plastic Sheet Production Machinery may require additional risk reduction measures not included in this standard.

To assist in the interpretation and implementation 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 12 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.

Suggestions for improvement of this standard will be welcome. They should be sent to PLASTICS, Director of Industry Standards, 1425 K Street, NW, Suite 500, Washington, DC 20005

The Extrusion Safety and Standards Development Committee of PLASTICS, which was responsible for this standard, had the following members (at time of publication of ANSI/SPI B151.20-2013):

John L. Radovich - Chairman	Davis-Standard, LLC
Brian Bish	Milacron
Ken Cavanagh	Parkinson Technologies, Inc.
Matthew Caruso	Techmer PM
Joe Cassidy	Welex
Farid Danial	Ipex
David Dorosa	PTI Extruders
Brad Eisenbarth	American Maplan Corporation
Steve Gammell	Macchi North America, Inc.
Steve Gates	Entek
Stan Glover	Zeiger Industries
Al Hodge	R&B Plastics
Tom Limbrunner	PTI Extruders
Loren Mills	S.A.F.E. LLC
Mike Mitchell	Davis-Standard, LLC
Jim Pilavdzic	Husky Injection Molding Systems, Inc.
Benjamin Prinsen	Macro Engineering
Dave Rossi	Welex
Steve Schroeder	Invensys
Joe Suhay	Macro Engineering
Rich Taylor	Coperion
John Toth	Rockwell
David Felinski	PLASTICS - Secretary

Table of Contents		Page
Foreword		4
Effective Date		4
1 Scope and purpose		9
1.1 Scope		9
1.2 Purpose		9
2 Normative references		10
2.1 Informative references		10
3 Definitions		11
4 Care – responsibility for		17
4.1 Instructions		17
4.1.1 Supplier		17
4.1.2 Modifier.....		17
4.2 Remanufacturer		17
4.3 Training of maintenance and/or set-up personnel		17
4.4 Inspection and maintenance		17
5 Responsibility for manufacture, repair, remanufacture, modification, and rebuild		18
5.1 Responsibility		18
5.1.1 Manufacture		18
5.1.2 Remanufacture.....		18
5.1.3 Modification		18
5.1.4 Repair		18
5.1.5 Rebuild		18
6 Hazards		19
6.1 Specific machine areas where hazards exist		19
6.1.1 Polishing roll stand		19
6.1.2 Pull roll stand.....		19
6.1.3 Heat transfer system		20
6.1.4 Slitter		20
6.1.5 Die		20
6.1.6 Wheels and machine movement.....		20
6.2 Other hazards		20
6.2.1 Electrical hazards.....		20
6.2.2 Vapors		20
6.2.3 Platforms		20
7 Safety requirements		23
7.1 General guarding		23
7.2 General safety requirements		25
7.2.1 Window.....		25
7.2.2 Thermal hazards		25
7.2.3 Hoses		25
7.2.4 Electrical requirements		25
7.3 Additional safety requirements and/or methods in specific machine areas		29
7.3.1 Type I Interlock (Figure 5)		29

7.3.2	Type II Interlock (Figure 6).....	29
7.3.3	Polishing roll stand.....	31
7.3.4	Pull roll stand.....	34
7.3.5	Heat transfer system.....	36
7.3.6	Slitter 36	
7.3.7	Die 36	
7.3.8	Wheels and machine movement.....	36
7.4	Other hazards.....	37
7.4.1	Electrical hazards.....	37
7.4.2	Vapors or gases.....	37
7.4.3	Platforms.....	37
8	User responsibility.....	37
9	Use.....	38
9.1	Instruction.....	38
9.2	Work area.....	38
9.3	Ancillary equipment.....	38
9.4	Personal protective equipment.....	38
9.5	Temperature set point.....	38
9.6	Ventilation.....	38
9.7	Interrupted operation.....	38
9.8	Hose Inspection.....	39
10	Safety signs.....	39
ANNEX A - PLASTICS RECOMMENDED PROCEDURES.....		40
A1	Lockout/Tagout Procedure when performing Servicing and/or Maintenance.....	40
A2	Sheetline Start-up Procedure.....	42
A3	Cleaning Polishing Roll Procedure.....	43

Explanation of Standard Format

American National Standard ANSI/PLASTICS B151.20-2013 (R2018) uses a two-column format to provide for specific requirements and supporting information.

The left column, designated "Standard Requirements," is confined solely to these requirements and is printed in bold type.

The right column, designated "Explanatory Information" contains only information that is intended to clarify the standard. This column is not a normative part of the standard. Where supplementary photographs or sketches are required, they are designated as "Illustrations."

Operating rules (safe practices) are not included in either column unless they are of such a nature as to be vital safety requirements that are equal in weight to other requirements, or unless they are guides to assist in compliance with the standard.

STANDARD REQUIREMENTS

EXPLANATORY INFORMATION

American National Standard for Plastics Machinery

Safety Requirements for Plastic Sheet Production Machinery

STANDARD REQUIREMENTS

EXPLANATORY INFORMATION

(Not a normative part of American National Standard for Plastics Machinery – Safety Requirements for Plastic Sheet Production Machinery ANSI/PLASTICS B151.20-2013 (R2018))

1 Scope and purpose

1.1 Scope

The requirements of this standard shall apply to plastic sheet production machinery.

Plastic sheet production machinery 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.

This standard also specifies safety requirements relating to the design and construction of multi-roll calendars intended for the processing of plastics and concerns the calendar including all components fixed to its frame.

Safety requirements of ancillary equipment used with plastic sheet production machinery are not covered by this standard.

1.2 Purpose

The purpose of this standard is to identify and address known hazards to personnel working on, or adjacent to, the plastic sheet production machinery.

E1.1

In developing the requirements of this standard, the committee used the risk assessment process. A list of hazards typical of Plastic Sheet Production Machinery appears in clause 6 of this standard. For each hazard identified within the scope of the standard, 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 inclusive, and additional Annex reference material. 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 Plastic Sheet Production Machinery 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.