

Association for Advancing Automation (A3) 2018 - Standards Terms, Abbreviations, Codes & Titles

Standards Group	Designation Code, Term, or Abbreviation	Short Version	Title or Definition
ANSI STANDARDS & SUPPLEMENTAL DOCUMENTS			
ANSI	B11	B11	B11, Safety of Machinery (Family of standards); managed by B11 Standards, Inc.
ANSI	ANSI B11.0-2015	B11.0	Safety of Machines: General requirements and risk assessment [<i>being updated; planned publication: 2019</i>]
ANSI	ANSI B11.19-2010	B11.19	Performance Criteria for Safeguarding [<i>being updated; planned publication of revision: 2019</i>]
ANSI	ANSI B11.20-2017	B11.20	Safety Requirements for the Integration of Machinery into a System [abbreviated IMS] [<i>note new title; no technical changes</i>]
ANSI	B56	B56	Industrial Truck Safety Standards (Family of standards); managed by ITSDF
ANSI	ANSI/ITSDF B56.5-2012	B56.5	Safety Standard for Driverless, Automatic Guided Industrial Vehicles and Automated Functions of Manned Industrial Vehicles [abbreviated AGV]
ANSI	ANSI/PMMI B155.1-2016	B155.1	Safety Requirements for Packaging and Processing Machinery
ANSI	R15	R15	Robot Safety Standards (Family of standards); managed by Robotic Industries Association (RIA)
ANSI	ANSI/RIA R15.06-2012	R15.06	American National Standard for Industrial Robots and Robot Systems - Safety Requirements [U.S. National Adoption of 10218-1,2:2011]
ANSI	ANSI/RIA R15.08-201X	R15.08	American National Standard on Industrial Mobile Robots and Robot Systems - Safety Requirements [<i>in development</i>]
ANSI	RIA TR R15.306-2016	TR 306	[Technical Report for Industrial Robots and Robot systems -- Safety Requirements --] Task-based Risk Assessment Methodology
ANSI	RIA TR R15.406-2014	TR 406	[Technical Report for Industrial Robots and Robot systems -- Safety Requirements --] Safeguarding
ANSI	RIA TR R15.506-2014	TR 506	[Technical Report for Industrial Robots and Robot systems -- Safety Requirements --] Applicability of ANSI/RIA R15.06-2012 for Existing Industrial Robot Applications
ANSI	RIA TR R15.606-2016	TR 606	[Technical Report for Industrial Robots and Robot systems -- Safety Requirements --] Collaborative Robots [U.S. National Adoption of ISO/TS 15066:2016]
ANSI	RIA DTR R15.706-201X	TR 706	[Technical Report for Industrial Robots and Robot systems -- Safety Requirements --] Guidance for Users [<i>in development; likely publication: 2019</i>]
ANSI	RIA DTR R15.806-201X	TR 806	[Technical Report for Industrial Robots and Robot systems -- Safety Requirements --] Testing Methods for Power & Force Limited Collaborative Applications [<i>in publication process, publication in early 2019</i>]
ANSI	RIA DTR R15.906-201X	TR 906	[Technical Report for Industrial Robots and Robot systems -- Safety Requirements --] Programming, verification, integration, and validation of safety-related software systems [<i>in development</i>]
ANSI	ANSI/ASSE Z244.1-2016	Z244.1	Control of Hazardous Energy – Lockout, Tagout and Alternative Methods
CSA (Canadian) STANDARDS			
CSA	CSA Z432-16	Z432	Safeguarding of machinery
CSA	CAN/CSA Z434-14	Z434	Industrial robots and robot systems [Canadian adoption of 10218-1,2, 2011, with Canadian deviations]
CSA	CSA Z460-13	Z460	Control of Hazardous Energy – Lockout and Other Methods
EN (European) STANDARDS			
EN	EN 1525	1525	Safety of industrial trucks - Driverless trucks and their systems
EN	EN 1526	1526	Safety of industrial trucks - Additional requirements for automated functions on trucks
IEC STANDARDS			
IEC	IEC 60204-1:2016	60204	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
IEC	IEC 61496-1:2012	61496	Safety of machinery - Electro-sensitive protective equipment - Part 1: General requirements and tests
IEC	IEC 61508-2010	61508	Functional safety of electrical/ electronic/ programmable electronic safety-related systems. Part 1 contains General Requirements; there are additional Parts 2 - 7.
IEC	IEC 62046:2018	62046	Safety of machinery - Application of protective equipment to detect the presence of persons [<i>updated in 2018</i>]
IEC	IEC 62061-1:2005+A1:2012+A2:2015	62061	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems [<i>Note: Amended (1) in 2012 and (2) in 2015</i>]
ISO STANDARDS & SUPPLEMENTAL DOCUMENTS			
ISO	ISO 3691-4	3691-4	Industrial trucks -- Safety requirements and verification -- Part 4: Driverless industrial trucks and their systems [<i>in development</i>]
ISO	ISO 8373:2012	8373	Robots and robotic devices -- Vocabulary
ISO	ISO 10218-1:2011	Part 1	Robots and robotic devices -- Safety requirements for industrial robots -- Part 1: Robots [<i>being updated</i>]
ISO	ISO 10218-2:2011	Part 2	Robots and robotic devices -- Safety requirements for industrial robots -- Part 2: Robot systems and integration [<i>being updated; planned publication of revision: 2021</i>]
ISO	ISO/TS 15066:2016	15066	[Technical Specification] Robots and Robotic devices -- Collaborative Robots
ISO	ISO/TR 20218-1:2018	End-Effectors	[Technical Report] Robotics -- Safety Design for industrial robot systems -- Part 1: End-effector(s) [<i>Note: "End-Effector" also known as "End-of-arm-tooling" or "EOAT".</i>]
ISO	ISO/TR 20218-2:2017	MLUS	[Technical Report] Robotics -- Safety Design for industrial robot systems -- Part 2: Manual Load/ Unload Stations
ISO	ISO 11161:2007	11161	Safety of machinery -- Integrated manufacturing systems -- Basic requirements [Reviewed and confirmed in 2015; this version remains current]
ISO	ISO 12100:2010	12100	Safety of machinery - General principles for design -- Risk assessment and risk reduction
ISO	ISO 13482:2014	13482	Robots and robotic devices -- Safety requirements for personal care robots
ISO	ISO 13849-1:2015	13849	Safety of machinery - Safety-related parts of control systems -- Part 1: General principles for design [abbreviated SRP/CS]
ISO	ISO 13849-2:2012	13849	Safety of machinery - Safety-related parts of control systems -- Part 2: Validation
ISO	ISO 13850:2015	13850	Safety of machinery - Emergency stop function -- Principles for design
ISO	ISO 13854:2017	13854	Safety of Machinery - Minimum Gaps to avoid crushing of parts of the human body
ISO	ISO 13855:2010	13855	Safety of Machinery - Positioning of Safeguards with respect to the approach speeds of parts of the human body
ISO	ISO 13857:2008	13857	Safety of Machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs [Reviewed and confirmed in 2011; this version remains current]

Italics marks standards that are currently in development

Association for Advancing Automation (A3) 2018 - Standards Terms, Abbreviations, Codes & Titles

Standards Group	Designation Code, Term, or Abbreviation	Short Version	Title or Definition
ISO	ISO 14118:2017	14118	Safety of machinery - Prevention of unexpected start-up <i>[updated in 2017]</i>
ISO	ISO 14119:2013	14119	Safety of machinery - Interlocking devices associated with guards -- Principles for design and selection
ISO	ISO 14120:2015	14120	Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards
ISO	ISO 14121-2:2012	14121-2	Safety of Machinery - Risk Assessment - Part 2: Practical Guidance and examples of methods
ISO	ISO 45001:2018	45001	Occupational health and safety <i>[new in 2018]</i>
NFPA STANDARDS			
NFPA	NFPA 79-2018	NFPA 79	Electrical Standard for Industrial Machinery <i>[updated in 2018]</i>
NFPA	NFPA 70E-2018	NFPA 70E	Standard for Electrical Safety in the Workplace <i>[updated in 2018]</i>
UL STANDARDS			
UL	UL STP 1740-2018	UL 1740	Standard for Robots and Robotic Equipment <i>[updated in 2018]</i>
UL	UL O3100	UL O3100	Outline of Investigation for Automated Guided Vehicles (AGVs) <i>[Outline only - contents under development]</i>
STANDARDS DEVELOPMENT ORGANIZATIONS (SDOs), COMMITTEES & CONCEPTS			
ANSI	ANSI	ANSI	American National Standards Institute; National Standards Body (NSB) for the U.S.
ANSI	ITSDF	ITSDF	Industrial Truck Standards Development Foundation; SDO
ANSI	B11	B11	B11 Standards; SDO
ANSI	MHI	MHI	Material handling association; SDO
ANSI	NFPA	NFPA	National Fire Protection Association; SDO
ANSI	PMMI	PMMI	Packaging Machinery Manufacturers Institute; SDO
ANSI	R15 SAC	SAC	R15 Standards Approval Committee; oversees development and revision of R15.06 and R15.08 and related TRs
ANSI	R15.06	R15.06	R15.06 Drafting Subcommittee on Industrial Robot Safety
ANSI	R15.08	R15.08	R15.08 Drafting Subcommittee on Industrial Mobile Robot Safety
ANSI	RIA	RIA	Robotic Industries Association; SDO
ANSI	SDO	SDO	Standards Developing Organization working in the ANSI framework; e.g., B11, ITSDF, RIA, etc.
ANSI	UL, LLC	UL	Underwriters Laboratories; SDO, research, and certification organization
ANSI	U.S. TAG to ISO TC 299	U.S. TAG	U.S. Technical Advisory Group to ISO Technical Committee 299, Robotics
EN	EN	EN	European standards (ENs) are documents that have been ratified by one of the three European Standardization Organizations (ESOs): CEN, CENELEC, or ETSI.
IEC	IEC	IEC	International Electrotechnical Commission
ISO	ISO	ISO	International Organization for Standardization
ISO	NSB	NSB	National Standards Bodies (e.g., ANSI, BSI, CSA, DIN, JISC, etc.) - the official members of ISO for their respective countries
ISO	ISO TC 184	TC 184	ISO Technical Committee 184, Automation systems and integration
ISO	ISO TC 199	TC 199	ISO Technical Committee 199, Safety of Machinery
ISO	ISO TC 299	TC 299	ISO Technical Committee 299, Robotics
ISO	ISO TC 299/ WG 3	WG 3	ISO Technical Committee 299, Robotics, Working Group 3, Industrial Safety
EEC	Machinery Directive	MD	European Machinery Directive, Directive 2006/42/EC; intended to ensure a common safety level of machinery placed on the market or put in service in all member states.
NIOSH	NIOSH	NIOSH	National Institute for Occupational Safety and Health (U.S.) - Research body; part of US Health and Human Services (HHS)/Centers
NIST	NIST	NIST	National Institute of Standards and Technology (U.S.) - Research body; part of US Department of Commerce
OSHA	OSHA	OSHA	Occupational Safety and Health Administration (U.S.) - Regulatory body; part of US Department of Labor
SCC	SCC	SCC	Standards Council of Canada; National Standards Body for Canada [equivalent to ANSI]
SCC	CSA Group	CSA	Canadian Standards Association; an SDO, testing, and certification body of Canada; accredited by SCC
Type A	Basic Safety Standards	Type A	Basic Standards, addressing general principles for safety of machines. Examples: ANSI B11.0; ISO 12100. [Note: The concept of Type A, B, and C standards originated in Europe and is strictly enforced there; some ANSI SDOs have chosen to follow a similar structure but it is not required.]
Type B	Group Safety Standards	Type B	Generic/ Group Safety Standards, addressing certain aspects of safeguarding across a sub-set or range of machinery types. Examples: ANSI B11.19, ISO 13849.
Type B1	Type B Safety Standards for safety aspects	Type B1	Generic/ Group Standards, general safety aspects. Example: ISO 13849.
Type B2	Type B Safety Standards for systems & safeguards	Type B2	Generic/ Group Standards, systems and safeguards. Example: ANSI B11.19.
Type C	Specialist Standards	Type C	Specialist Standards, addressing specific safety features and requirements for individual machinery groups; e.g., robots, elevators, etc. All included requirements are specific to that type of machine; if a conflict exists between the Type-C and Type-B standard, typically the Type-C standard prevails. Examples: ANSI R15.06, ISO 10218.
Various	National Adoption		The adoption of a published international standard as National Standard under the auspices of a National Standards Body (e.g., ANSI for U.S.); content may be unchanged from the original (except for minor spelling and formatting edits), or content may be modified; if modified, must be so marked (e.g., "national deviation").
Various	Functional Safety	FS	Functional Safety is the detection of a potentially dangerous condition resulting in the activation of a protective or corrective device or mechanism to prevent hazardous events arising or providing mitigation to reduce the consequence of the hazardous event. Relies on active systems.
U.S. LEGISLATION, CODES, and REGULATIONS			
OSH Act	OSH Act of 1970	OSH Act	U.S. Occupational Safety and Health Act of 1970 [authorizing the creation of OSHA and NIOSH]
OSHA	29 CFR 1910	1910	General Industry Health and Safety Regulations [See especially Subparts O, P, Q, and R]
OSHA	OSHA 29 CFR §1910.147	1910.147	Occupational Safety and Health Standards -- Control of hazardous energy (lockout/tagout)
OSHA	OSHA 29 CFR §1910.212	1910.212	Occupational Safety and Health Standards -- General Requirements for all Machines
OSHA	OSHA 29 CFR §1910.219	1910.219	Occupational Safety and Health Standards -- Mechanical power-transmission apparatus
U.S.C.	29 U.S.C. § 654, 5(a)	General Duty Clause	United States Code (U.S.C.) Title 29, Labor; Chapter 15, Occupational Safety and Health; § 654, General Duty Clause; Responsibility of an employer to provide a place of employment free from recognized hazards that are likely to cause death or serious physical harm, and to comply with the standards [regulations] promulgated under this act.