



[ISO/TC 199](#)

Safety of machinery

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Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and the new ISO 12100:2010

Date of document	2010-11-18
Expected action	Info

Background

As agreed by resolution 179 taken by ISO/TC 199 "Safety of machinery" the enclosed table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and the new ISO 12100:2010 "*Safety of machinery - General principles for design - Risk assessment and risk reduction*" published on 2010-11-01 is provided for the convenience of the users of these International Standards on behalf of ISO/TC 199.

ISO 12100:2010 constitutes a consolidation without technical changes of ISO 12100-1: 2003, ISO 12100-2: 2003, ISO 14121-1: 2007 and related Amendments. **This consolidation does not require updates or revisions to type B- and type C-standards or other documents (e.g. for risk assessment) based on the prior standards!**



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
		← Foreword →		Updated
		← Introduction →		ISO 12100-1 + the three last indents of ISO 14121-1 updated
		← 1 Scope →		Combination of the scopes of the three standards
		← 2 Normative references →		Updated
		← 3 Terms and definitions →		Combination of the definitions of the three standards. Origins are in bold characters.
3.1		3.7	3.1	Updated according to Directive 2006/42/ EC
3.2			3.2	
3.3			3.3	Wording slightly improved
3.4			3.4	Wording slightly improved
3.5		3.1	3.5	
3.6		3.2	3.6	French synonymous deleted – Introduction of Note 3
3.7			3.7	Introduction of Note 2
3.8			3.8	Introduction of the Note
		3.4	3.9	
3.9		3.5	3.10	Second sentence becomes a note
3.10		3.3	3.11	
3.11		3.12	3.12	
3.12		3.11	3.13	Improvement in the wording : <i>the protective measures are implemented.</i>
3.15		3.14	3.14	
3.14		3.13	3.15	



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
3.16		3.15	3.16	
3.13		3.16	3.17	
3.17			3.18	Wording slightly improved
3.18		3.9	3.19	Introduction of"/or " to 1 st dash
3.19			3.20	
3.20			3.21	Wording slightly improved
3.21			3.22	
3.22		3.6	3.23	Wording slightly improved
3.23		3.10	3.24	
		3.17	3.25	
3.24			3.26	
3.25			3.27	Wording slightly improved
3.25.1			3.27.1	
3.25.2			3.27.2	
3.25.3			3.27.3	Simplified – 2 nd sentence deleted
3.25.4			3.27.4	Wording slightly improved
3.25.5			3.27.5	
3.25.6			3.27.6	
3.26			3.28	
3.26.1			3.28.1	
3.26.2			3.28.2	The note disappeared.
3.26.3			3.28.3	
3.26.4			3.28.4	
3.26.5			3.28.5	Second sentence becomes a note
3.26.6			3.28.6	
3.26.7			3.28.7	



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
3.26.8			3.28.8	
3.26.9			3.28.9	
3.27			3.29	
3.28			3.30	
3.29			3.31	French version, change of the order of the terms – Wording improved
3.30			3.32	
3.31			3.33	
3.32			3.34	
3.33			3.35	
3.34			3.36	
		3.8	3.37	
3.35			3.38	Wording slightly improved
3.36			3.39	
3.37			3.40	Introduction of a 2 nd term
3.38			3.41	
3.39			3.42	
4 Hazards to be taken into account when designing machinery				Deleted, overlapping with ISO 14121-1:2007, Annex A
			4 Strategy for risk assessment and risk reduction	Combination of indents coming from ISO 12100-1:2003, Clause 5 and ISO 14121-1:2007, 4.1
5.1.3				Improved
		4.1 1 st indent		Subdivided



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
5.1.1				Wording improved (see 3.13). A 2 nd sentence is introduced
5.1.2				Improvement in the wording
5.1.4				
Figure 2			Figure 1 — Schematic representation of risk reduction process including iterative three-step method	Figure slightly improved
Figure 1			Figure 2 — Risk reduction process from point of view of designer	Improvement in the wording : <i>the protective measures are implemented.</i>
			5 Risk assessment	
			5.1 General	
		4.1 last indents		Last indent simplified, Figure 1 and 1 st indent deleted
5.1.3 1 st sentence		4.2 Information for risk assessment	5.2 Information for risk assessment	Some improvements; new 5.2.c) 3
		5 Determination of limits of machinery	5.3 Determination of limits of machinery 5.3.1 General 5.3.2 Use limits 5.3.3 Space limits 5.3.4 Time limits 5.3.5 Other limits	Some improvements (wording and order of subclauses)
		6 Hazard identification	5.4 Hazard identification	2 nd indent deleted
		7 Risk estimation	5.5 Risk estimation	



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
5.1.6		7.1 General	5.5.1 General	
		7.2 Elements of risk 7.2.1 General	5.5.2 Elements of risk 5.5.2.1 General	
		Figure 2	Figure 3 — Elements of risk	
		7.2.2 Severity of harm	5.5.2.2 Severity of harm	
5.3 last indent				
		7.2.3 Probability of occurrence of harm	5.5.2.3 Probability of occurrence of harm	
		7.2.3.2 Exposure of persons to hazards	5.5.2.3.1 Exposure of persons to the hazard	
		7.2.3.3 Occurrence of hazardous events	5.5.2.3.2 Occurrence of a hazardous event	
		7.2.3.4 Possibilities of avoiding or limiting harm	5.5.2.3.3 Possibilities of avoiding or limiting harm	Wording slightly improved
		7.3 Aspects to be considered during risk estimation	5.5.3 Aspects to be considered during risk estimation	
		7.3.1 Persons exposed	5.5.3.1 Persons exposed	
		7.3.2 Type, frequency and duration of exposure	5.5.3.2 Type, frequency and duration of exposure	
		7.3.3 Relationship between exposure and effects	5.5.3.3 Relationship between exposure and effects	New note 2
		7.3.4 Human factors	5.5.3.4 Human factors	Last indent of 7.3.4 become 5.5.3.4 g) modified
		7.3.5 Suitability of protective measures	5.5.3.5 Suitability of protective measures	Second indent improved



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
5.1.5			5.5.3.6 Possibility of defeating or circumventing protective measures	Some editorial improvements Last indent: first sentence modified
		7.3.6 Possibility of defeating or circumventing protective measures		
		7.3.7 Ability to maintain protective measures	5.5.3.7 Ability to maintain protective measures	
		7.3.8 Information for use	5.5.3.8 Information for use	
		8 Risk evaluation	5.6 Risk evaluation	
		8.1 General	5.6.1 General	First indent modified
		8.2 Achievement of adequate risk reduction	5.6.2 Adequate risk reduction	The introductory sentence has been modified.
		8.2.2 Presumptions of adequate risk reduction		The wording of the last indent has been modified
		8.3 Comparison of risks	5.6.3 Comparison of risks	
			6 Risk reduction	
5.4 Elimination of hazards or reduction of risk by protective measures		8.2.1	6.1 General	This subclause has been improved. Combination of indents coming from ISO 12100-1:2003, 5.4 and ISO 14121-1:2007, 8.2.1 modified
	4 Inherently safe design measures		6.2 Inherently safe design measures	
	4.1 General		6.2.1 General	Wording slightly improved
	4.2 Consideration of geometrical factors		6.2.2 Consideration of geometrical factors and	Wording slightly improved



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
	and physical aspects		physical aspects	
	4.2.1 Geometrical factors		6.2.2.1 Geometrical factors	Wording slightly improved
	4.2.2 Physical aspects		6.2.2.2 Physical aspects	Wording slightly improved
	4.3 Taking into account the general technical knowledge regarding machine design		6.2.3 Taking into account general technical knowledge of machine design	
	4.4 Choice of an appropriate technology		6.2.4 Choice of appropriate technology	Reference updated
	4.5 Applying the principle of the positive mechanical action of a component on another component		6.2.5 Applying principle of positive mechanical action	Subclause modified.
	4.6 Provisions for stability		6.2.6 Provisions for stability	Wording slightly improved
	4.7 Provisions for maintainability		6.2.7 Provisions for maintainability	
	4.8 Observing ergonomic principles		6.2.8 Observing ergonomic principles	Improvement of the subdivisions: e.g. 4.8.7 -> 6.2.8.f)
	4.9 Preventing electrical hazard		6.2.9 Electrical hazards	
	4.10 Preventing hazards from pneumatic and		6.2.10 Pneumatic and hydraulic hazards	

Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
	hydraulic equipment			
	4.11 Applying inherently safe design measures to control system		6.2.11 Applying inherently safe design measures to control systems	
	4.11.1 General		6.2.11.1 General	
	4.11.2 Starting of an internal power source/switching on an external power supply		6.2.11.2 Starting of an internal power source/switching on an external power supply	Subclause modified
	4.11.3 Starting/stopping of a mechanism		6.2.11.3 Starting/stopping of a mechanism	Editorial improvement
	4.11.4 Restart after power interruption		6.2.11.4 Restart after power interruption	
	4.11.5 Interruption of power supply		6.2.11.5 Interruption of power supply	
	4.11.6 Use of automatic monitoring		6.2.11.6 Use of automatic monitoring	
	4.11.7 Safety functions implemented by programmable electronic control systems		6.2.11.7 Safety functions implemented by programmable electronic control systems	
	4.11.7.1 General		6.2.11.7.1 General	Merging of the first two indents
	4.11.7.2 Hardware aspects		6.2.11.7.2 Hardware aspects	
	4.11.7.3 Software aspects		6.2.11.7.3 Software aspects	<i>These two subclauses have been merged.</i>



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
	4.11.7.4 Application software			
	4.11.8 Principles relating to manual control		6.2.11.8 Principles relating to manual control	
	4.11.9 Control mode for setting, teaching, process changeover, fault-finding, cleaning or maintenance		6.2.11.9 Control mode for setting, teaching, process changeover, fault-finding, cleaning or maintenance	A 4 th dash has been introduced
	4.11.10 Selection of control and operating modes		6.2.11.10 Selection of control and operating modes	
	4.11.11 Applying measures to achieve electromagnetic compatibility (EMC)		6.2.11.11 Applying measures to achieve electromagnetic compatibility (EMC)	
	4.11.12 Provision of diagnostic systems to aid fault-finding		6.2.11.12 Provision of diagnostic systems to aid fault-finding	
	4.12 Minimizing the probability of failure of safety functions		6.2.12 Minimizing probability of failure of safety functions	
			6.2.12.1 General	Hanging text
	4.12.1 Use of reliable components		6.2.12.2 Use of reliable components	
	4.12.2 Use of "oriented failure mode" components		6.2.12.3 Use of "oriented failure mode" components	
	4.12.3 Duplication (or redundancy) of		6.2.12.4 Duplication (or redundancy) of components	



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
	components or subsystems		or subsystems	
	4.13 Limiting exposure to hazards through reliability of equipment		6.2.13 Limiting exposure to hazards through reliability of equipment	
	4.14 Limiting exposure to hazards through mechanization or automation of loading (feeding) / unloading (removal) operations		6.2.14 Limiting exposure to hazards through mechanization or automation of loading (feeding) / unloading (removal) operations	
	4.15 Limiting exposure to hazards through location of the setting and maintenance points outside of danger zones		6.2.15 Limiting exposure to hazards through location of setting and maintenance points outside danger zones	
	5 Safeguarding and complementary protective measures		6.3 Safeguarding and complementary protective measures	
	5.1 General		6.3.1 General	
	5.2 Selection and implementation of guards and protective devices		6.3.2 Selection and implementation of guards and protective devices	
	5.2.1 General		6.3.2.1 General	
Figure 1 — Guidelines to help make the choice of			Figure 4 — Guidelines for choosing safeguards against hazards generated	



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
	safeguards against hazards generated by moving parts		by moving parts	
	5.2.2 Where access to the hazard zone is not required during normal operation		6.3.2.2 Where access to the hazard zone is not required during normal operation	
	5.2.3 Where access to the hazard zone is required during normal operation		6.3.2.3 Where access to the hazard zone is required during normal operation	
	5.2.4 Where access to the hazard zone is required for machine setting, teaching, process changeover, fault finding, cleaning or maintenance		6.3.2.4 Where access to the hazard zone is required for machine setting, teaching, process changeover, fault finding, cleaning or maintenance	
	5.2.5 Selection and implementation of sensitive protective equipment		6.3.2.5 Selection and implementation of sensitive protective equipment	
	5.2.5.1 Selection		6.3.2.5.1 Selection	
	5.2.5.2 Implementation		6.3.2.5.2 Implementation	Improvement of the subdivisions
	5.2.5.3 Additional requirements for sensitive protective equipment used for cycle initiation		6.3.2.5.3 Additional requirements for sensitive protective equipment when used for cycle initiation	Improvement of the subdivisions Introduction of a reference to IEC/TS 62046 in a note.



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ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
	5.2.6 Protective measures for stability		6.3.2.6 Protective measures for stability	
	5.2.7 Other protective devices		6.3.2.7 Other protective devices	Improvement of the subdivisions.
	5.3 Requirements for the design of guards and protective devices		6.3.3 Requirements for design of guards and protective devices	
	5.3.1 General requirements		6.3.3.1 General requirements	Improvement of the subdivisions and references
	5.3.2 Requirements of guards		6.3.3.2 Requirements for guards	
	5.3.2.1 Functions of guards		6.3.3.2.1 Functions of guards	
	5.3.2.2 Requirements for fixed guards		6.3.3.2.2 Requirements for fixed guards	
	5.3.2.3 Requirements for movable guards		6.3.3.2.3 Requirements for movable guards	
	5.3.2.4 Requirements for adjustable guards		6.3.3.2.4 Requirements for adjustable guards	
	5.3.2.5 Requirements for interlocking guards with a start function (control guards)		6.3.3.2.5 Requirements for interlocking guards with a start function (control guards)	Improvement of the subdivisions.
	5.3.2.6 Hazards from guards		6.3.3.2.6 Hazards from guards	



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
	5.3.3 Technical characteristics of protective devices		6.3.3.3 Technical characteristics of protective devices	
	5.3.4 Provisions for alternative types of safeguards		6.3.3.4 Provisions for alternative types of safeguards	
	5.4 Safeguarding for reducing emissions		6.3.4 Safeguarding to reduce emissions	
	5.4.1 General		6.3.4.1 General	
	5.4.2 Noise		6.3.4.2 Noise	
	5.4.3 Vibration		6.3.4.3 Vibration	Introduction of three new dashes
	5.4.4 Hazardous substances		6.3.4.4 Hazardous substances	
	5.4.5 Radiation		6.3.4.5 Radiation	
	5.5 Complementary protective measures		6.3.5 Complementary protective measures	
	5.5.1 General		6.3.5.1 General	
	5.5.2 Components and elements to achieve the emergency stop function		6.3.5.2 Components and elements to achieve emergency stop function	
	5.5.3 Measures for the escape and rescue of trapped persons		6.3.5.3 Measures for the escape and rescue of trapped persons	
	5.5.4 Measures for isolation and energy dissipation		6.3.5.4 Measures for isolation and energy dissipation	
	5.5.5 Provisions for easy and safe		6.3.5.5 Provisions for easy and safe handling of	



Table of correspondence between ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and ISO 12100:2010 (version date 2010-11-05)

ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
	handling of machines and their heavy component parts		machines and their heavy component parts	
	5.5.6 Measures for safe access to machinery		6.3.5.6 Measures for safe access to machinery	
	6 Information for use		6.4 Information for use	
	6.1 General requirements		6.4.1 General requirements	
	6.1.1		6.4.1.1	Hanging text
	6.1.2		6.4.1.2	
	6.2 Location and nature of the information for use		6.4.1.3	
	6.3 Signals and warning devices		6.4.2 Location and nature of information for use	
	6.4 Markings, signs (pictograms), written warnings		6.4.3 Signals and warning devices	Improvement of the subdivisions, introduction of a reference to ISO 4413 and ISO 4414
	6.5 Accompanying documents (in particular, instruction handbook)		6.4.4 Markings, signs (pictograms) and written warnings	
	6.5.1 Contents		6.4.5 Accompanying documents (in particular — instruction handbook)	
			6.4.5.1 Contents	Improvement of the subdivisions, introduction of 6.4.5.1 e), item 2) spare parts, 6.4.5.1. g) item 1) accident



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ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
	6.5.2 Production of the instruction handbook		6.4.5.2 Production of instruction handbook	
	6.5.3 Advice for drafting and editing information for use		6.4.5.3 Drafting and editing information for use	Introduction of "standards or other specifications used"
		9 Documentation	7 Documentation of risk assessment and risk reduction	
Annex A Schematic representation of a machine			Annex A Schematic representation of a machine	
		Annex A Examples of hazards, hazardous situations and hazardous events	Annex B Examples of hazards, hazardous situations and hazardous events	
		A.1 General	B.1 General	
		A.2 Examples of hazards	B.2 Examples of hazards	
		Table A.1	Table B.1	
		Table A.2	Table B.2	
		A.3 Examples of hazardous situations	B.3 Examples of hazardous situations	
		Table A.3	Table B.3	Updated according Directive 2006/42/ EC
		A.4 Examples of hazardous events	B.4 Examples of hazardous events	
		Table A.4	Table B.4	



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ISO 12100-1:2003	ISO 12100-2:2003	ISO 14121-1:2007	ISO 12100: 2010	Remarks
Trilingual index of specific terms and expressions used in ISO 12100			Annex C Trilingual lookup and index of specific terms and expressions used in ISO 12100	Updated
Bibliography	Bibliography	Bibliography	Bibliography	Merging and updating of the origins