

## Deutsche Akkreditierungsstelle GmbH

### Annex to the Accreditation Certificate D-PL-12088-01-01 according to DIN EN ISO/IEC 17025:2005

Period of validity: 13.05.2016 to 12.05.2021

Date of issue: 13.05.2016

Holder of certificate:

**SGS-TÜV Saar GmbH**  
**Operation Site Munich**  
**Hofmannstraße 50, 81379 München**

Tests in the fields:

**Functional Safety (FS) and Safety of Machinery**

Abbreviations used: see last page

**The testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use standards or equivalent testing methods listed here with different issue dates. The testing laboratory maintains a current list of all testing methods within the flexible scope of accreditation.**

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
1. Functional Safety 1.1 Application-independent procedures 1.1.1 Basic procedures	IEC 61508-1:2010 EN 61508-1:2010 DIN EN 61508-1:2011-02 VDE 0803-1:2011-02	Functional safety of electrical / electronic/ programmable electronic safety-related systems - Part 1: General requirements	
	IEC 61508-2:2010 EN 61508-2:2010 DIN EN 61508-2:2011-02 VDE 0803-2:2011-02	Functional safety of electrical/ electronic/ programmable electronic safety-related systems - Part 2: Requirements for electrical/ electronic/ programmable electronic safety-related systems	
	IEC 61508-3:2010 EN 61508-3:2010 DIN EN 61508-3:2011-02 VDE 0803-3:2011-02	Functional safety of electrical/ electronic/ programmable electronic safety-related systems - Part 3: Software requirements	
	IEC 61508-4:2010 EN 61508-4:2010 DIN EN 61508-4:2011-02 VDE 0803-4:2011-02	Functional safety of electrical/ electronic/ programmable electronic safety-related systems - Part 4: Definitions and abbreviations	
	IEC 61508-5:2010 EN 61508-5:2010 DIN EN 61508-5:2011-2 VDE 0803-5:2011-2	Functional safety of electrical/ electronic/ programmable electronic safety-related systems - Part 5: Examples of methods for the determination of safety integrity levels	
	IEC 61508-6:2010 EN 61508-6:2010 DIN EN 61508-6:2011-02 VDE 0803-6:2011-02	Functional safety of electrical/ electronic/ programmable electronic safety-related systems - Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3	
	IEC 61508-7:2010 EN 61508-7:2010 DIN EN 61508-7:2011-02 VDE 0803-7:2011-02	Functional safety of electrical/ electronic/ programmable electronic safety-related systems - Part 7: Overview of techniques and measures	
	ISO 10218-1:2011-01 DIN EN 10218-2:2011-01	Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots	
	ISO 10218-2:2011-01 DIN EN 10218-2:2011-01	Robots and robotic devices - Safety requirements for industrial robots - Part 2: Robot systems and integration	

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
1. Functional Safety 1.1 Application-independent procedures 1.1.2 Methods	IEC 61025:2006 EN 61025:2007 DIN EN 61025:2007-08	Fault tree analysis (FTA)	
	IEC 61882:2001	Hazard and operability studies (HAZOP studies) - Application guide	
	DIN 25419:1985-11	Event tree analysis - method, graphical symbols and evaluation	
	IEC 60812:2006 EN 60812:2006 DIN EN 60812:2006-11	Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)	
1. Functional Safety 1.1 Application-independent procedures 1.1.3 Probabilistic methods	DIN EN 61709:2012-01	Electric components - Reliability - Reference conditions for failure rates and stress models for conversion	
	SN 29500-1:2004	Failure rates of components - expected values, General	
	SN 29500-2:2010	Failure rates of components - Part 2: Expected values for integrated circuits	
	SN 29500-3:2009	Failure rates of components - Part 3: Expected values for discrete semiconductors	
	SN 29500-4:2004	Failure rates of components - Part 4: Expected values for passive components	
	SN 29500-5:2004	Failure rates of components - Part 5: Expected values for electrical connections, electrical connectors and sockets	
	SN 29500-7:2005	Failure rates of components - Part 7: Expected values for relays	
	SN 29500-9:2005	Failure rates of components - Part 9: Expected values for switches and buttons	
	SN 29500-10:2005	Failure rates of components - Part 10: expected values for signal and pilot lamps	
	SN 29500-11:2013	Failure rates of components - Part 11: Expected values for contactors	
	SN 29500-12:2008	Failure rates of components - Part 12: Expected values for optical components	
SN 29500-15:2009	Failure rates of components - Part 15: Expected values for electromechanical protection devices in low voltage networks		

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
	SN 29500-16:2010	Failure rates of components - Part 16: Expected values for electromechanical control Pushbuttons, Signaling Devices and Position Switches in Low Voltage Networks	
	SN 29500-1 H1:2013	Failure rates of components - Note 1 on Part 1 - Expected values, General, Dates of issue	
	IEC/TR 62380:2004-08	Reliability data handbook - Universal model for reliability prediction of electronics components, PCBs and equipment	
	EN 61078:2006 DIN EN 61078:2006-10 IEC 61078:2006	Analysis techniques for dependability - Reliability block diagram and boolean methods	
	IEC 61165:2006 DIN EN 61165:2007-02	Application of Markov techniques	
1. Functional Safety	UL 1998:2013-12-18	Software in programmable components	
1.1	IEEE 830:1998	IEEE Recommended Practice for Software Requirements Specifications	
Application-independent procedures	IEEE 29148-2011	Systems and Software Engineering - Life Cycle Processes - Requirements Engineering	
1.1.4 Software	IEEE 1008:1987	IEEE Standard for Software Unit Testing	
	IEEE 1016:2009	IEEE Standard for Information Technology-- Systems Design -Software Design Descriptions	
	ISO/IEC 12207:2008-02 IEEE 12207:2008	Systems and software engineering - Software life cycle processes	
	ISO/IEC IEEE 12207.1:1997	Software Life Cycle Processes - Life Cycle Data	
1. Functional Safety	IEC 60870-5-1:1990 EN 60870-5-1:1993 DIN EN 60870-5-1:1994-07	Telecontrol equipment and systems - Part 5: Transmission protocols - section 1: Transmission frame formats	Only Functional Safety
1.1	EN 50159:2010 DIN EN 50159:2011-04 VDE 0831-159:2011-04	Railway applications - Communication, signalling and processing systems - Safety-related communication in transmission systems	Only Functional Safety
Application-independent procedures			
1.1.5 Data communication	IEC 61784-1:2010 EN 61784-1:2010 DIN EN 61784-1:2011-04	Industrial communication networks - Profiles - Part 1: Fieldbus profiles	Only Functional Safety

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
	IEC 61784-3-3:2010 EN 61784-3-3:2010 DIN EN 61784-3-3:2012-03	Industrial communication networks - Profiles - Part 3-3: Functional safety fieldbuses - Additional specifications for CPF 3	Only Functional Safety
	IEC 61784-3:2010 EN 61784-3:2010 DIN EN 61784-3:2012	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions	Only Functional Safety
	DIN EN 61784-3-3:2012	Industrial communication networks - Profiles - Part 3-3: Functional safety fieldbuses - Additional specifications for CPF 3	Only Functional Safety
	IEC 60870-5-6:2006 DIN EN 60870-5-6:2009	Telecontrol equipment and systems - Part 5-6: Guidelines for conformance testing for the IEC 60870-5 companion standards	With regard to Functional Safety
1. Functional Safety	VDI/VDE 2180 Sheet 1:2007-04	Safeguarding of industrial process plants by means of process control engineering - Introduction, terms, concepts	With regard to Functional Safety
1.2 Application-specific procedures	VDI/VDE 2180 Sheet 2:2007-04	Safeguarding of industrial process plants by means of process control engineering - Management system	With regard to Functional Safety
1.2.1 MSR-facilities	VDI/VDE 2180 Sheet 3:2007-04	Safeguarding of industrial process plants by means of process control engineering - Plant engineering, realisation and operation	With regard to Functional Safety
	VDI/VDE 2180 Sheet 4:2010-07	Safeguarding of industrial process plants by means of process control engineering - Verification of the hardware safety integrity of safety instrumented systems	With regard to Functional Safety
	VDI/VDE 2180 Sheet 5:2010-05	Safeguarding of industrial process plants by means of process control engineering (PCE) - Recommendations for practical use	With regard to Functional Safety

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
	IEC 61131-1:2003 EN 61131-1:2003 DIN EN 61131:2004-03	Programmable controllers - Part 1: General information	As far as relevant for electrical / programmable electronic safety units
	IEC 61511-1:2003 + Corrigendum 2004 EN 61511-1:2004 DIN EN 61511-1:2005-05 VDE 0810-1:2005-05	Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and software requirements	
	IEC 61511-2:2003 EN 61511-2:2004 DIN EN 61511-2:2005-05 VDE 0810-2:2005-05	Functional safety - Safety instrumented systems for the process industry sector - Part 2: Guidelines for the application of IEC 61511-1	
	IEC 61511-3:2003 + Corrigendum 2004 EN 61511-3:2004 DIN EN 61511-3:2005-05 VDE 0810-3:2005-05	Functional safety - Safety instrumented systems for the process industry sector - Part 3: Guidance for the determination of the required safety integrity levels	
	IEC 65A/622/CD:2012 DIN EN 61511-1 VDE 0810-1:2012-10	Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and software requirements	
	IEC 65A/625/CD:2012 DIN EN 61511-2 VDE 0810-2:2013-01	Functional safety - Safety instrumented systems for the process industry sector - Part 2: Guidelines for the application of IEC 61511-1	
	ANSI/ISA-84.00.01:2004 Part 1	Functional Safety: Safety Instrumented Systems for the Process Industry Sector Part 1: Framework, definitions, system, hardware and software requirements	
	ANSI/ISA-84.00.01:2004 Part 2	Functional Safety: Safety Instrumented Systems for the Process Industry Sector Part 2: Guidelines for the Application of ANSI/ISA-84.00.01-2004 Part 1	
	ANSI/ISA-84.00.01:2004 Part 3	Functional Safety: Safety Instrumented Systems for the Process Industry Sector Part 3: Guidance for the Determination of the Required Safety Integrity Levels - Informative	

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
	IEC 60880:2006 EN 60880:2009 DIN EN 60880:2010-03 VDE 0491-3-2:2010-03	Nuclear power plants - Instrumentation and control systems important to safety - Software aspects for computer-based systems performing category A functions	With regard to Functional Safety
	UL 508:1999-01-28	Industrielle Regeleinrichtungen Industrial Control Equipment	In regards to evaluation of Functional Safety
	UL 991:2004-10-22	Tests for Safety-Related Controls Employing Solid-State Devices	In regards to evaluation of Functional Safety
	IEC 61010-1:2010 + Cor. :2011 EN 61010-1:2010 DIN EN 61010-1:2011-07 VDE 0411-1:2011-07	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	In regards to evaluation of Functional Safety
	IEC 61131-1:2003 EN 61131-1:2003 DIN EN 61131-1:2004-03	Programmable controllers - Part 1: General information	As far as relevant for electrical / electronic / programmable electronic safety units
	IEC 61131-2:2007 EN 61131-2:2007 DIN EN 61131-2:2008-04 + Corrigendum 1:2009-01 VDE 0411-500:2008-04 + Corrigendum 1:2009-01	Programmable controllers - Part 2: Equipment requirements and tests	As far as relevant for electrical / electronic / programmable electronic safety units
1. Functional Safety	ISO 26262-2:2011-11	Road vehicles - Functional safety - Part 2: Management of functional safety	
1.2 Application-specific procedures	ISO 26262-3:2011-11	Road vehicles - Functional safety - Part 3: Concept phase	
1.2.2 Automotive Safety	ISO 26262-4:2011-11	Road vehicles - Functional safety - Part 4: Product development at the system level	
	ISO 26262-5:2011-11	Road vehicles - Functional safety - Part 5: Product development at the hardware level	

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
	ISO 26262-6:2011-11	Road vehicles - Functional safety - Part 6: Product development at the software level	
	ISO 26262-7:2011-11	Road vehicles - Functional safety - Part 7: Production and operation	
	ISO 26262-8:2011-11	Road vehicles - Functional safety - Part 8: Supporting processes	
	ISO 26262-9:2011-11	Road vehicles - Functional safety - Part 9: Automotive Safety Integrity Level (ASIL)-oriented and safety-oriented analyses	
	ISO 15998:2008-04	Earth-moving machinery - Machine control systems (MCS) using electronic components - Performance criteria and tests for functional safety	
	ISO 25119-1:2010-06	Tractors and machinery for agriculture and forestry - Safety-related parts of control systems - Part 1: General principles for design and development	
	ISO 25119-2:2010-06	Tractors and machinery for agriculture and forestry - Safety related parts of control systems - Part 2: Concept phase	
	ISO 25119-3:2010-06	Tractors and machinery for agriculture and forestry - Safety-related parts of control systems - Part 3: Series development, hardware and software	
	ISO 25119-4:2010-06	Tractors and machinery for agriculture and forestry - Safety-related parts of control systems - Part 4: Production, operation, modification and supporting processes	
	IEC 61982:2012 EN 61982:2012 DIN EN 61982:2013-04	Secondary batteries (except lithium) for the propulsion of electric road vehicles - Performance and endurance tests	Evaluation in regards to Functional Safety Automotive
	DIN EN 61660-2:2012	Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing	Evaluation in regards to Functional Safety Automotive
	ISO 12405-1:2011-08	Electrically propelled road vehicles - Test specification for lithium-ion traction battery packs and systems - Part 1: High-power applications	Evaluation in regards to Functional Safety Automotive



Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
	ISO 6469-1:2009-09	Electrically propelled road vehicles - Safety specifications - Part 1: On-board rechargeable energy storage system (RESS)	Evaluation in regards to Functional Safety Automotive
	ISO 6469-2:2009-09	Electrically propelled road vehicles - Safety specifications - Part 2: Vehicle operational safety means and protection against failures	Evaluation in regards to Functional Safety Automotive
	ISO 6469-3:2011-12	Electrically propelled road vehicles - Safety specifications - Part 3: Protection of persons against electric shock	Evaluation in regards to Functional Safety Automotive
	IEC 61851-1:2010 EN 61851-1:2011 DIN EN 61851-1:2012-01 VDE 0122-1:2012-01	Electric vehicle conductive charging system - Part 1: General requirements	Only Functional Safety
	IEC 61851-21:2001 EN 61851-21:2002 DIN EN 61851-21:2002-10 VDE 0122-2-1:2002-10	Electric vehicle conductive charging system - Part 2-1: Electric vehicle requirements for conductive connection to an a.c./d.c. supply	Only Functional Safety
	IEC 61851-22:2001 EN 61851-22:2002 DIN EN 61851-22:2002-10 VDE 0122-2-2:2002-10	Electric vehicle conductive charging system - Part 2-2: AC electric vehicle charging station	Only Functional Safety
1. Functional Safety 1.2 Application-specific procedures 1.2.3 Firing technology	DIN EN 50156-1:2005-03 VDE 0116-1:2005-03 DIN EN 50156-1:2013-05 VDE 0116-1:2013-05	Electrical equipment for furnaces and ancillary equipment - Part 1: Requirements for application design and installation <i>(Restriction: only control system)</i>	Only Functional Safety
	EN 230:2005-09	Automatic burner control systems for oil burners <i>(Restriction: only control system)</i>	Only Functional Safety
	EN 298:2012 DIN EN 298:2012-11	Automatic burner control systems for burners and appliances burning gaseous or liquid fuels <i>(Restriction: only control system)</i>	Only Functional Safety

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
	NFPA 85:2011	Boiler and Combustion Systems Hazards Code <i>(Restriction: only control system)</i>	Only Functional Safety
1. Functional Safety 1.2 Application-specific procedures	EN 54-1:2011 DIN EN 54-1:2011-06	Fire detection and fire alarm systems - Part 1: Introduction	Only Functional Safety of control system
1.2.4 Fire alarm systems	EN 54-2:1997 + EN 54-2:1997/A1:2006 DIN EN 54-2:1997-12 + DIN EN 54-2/A1:2007-01	Fire detection and fire alarm systems - Part 2: Control and indicating equipment	Only Functional Safety of control system
	EN 54-13:2005 DIN EN 54-13:2005-08	Fire detection and fire alarm systems - Part 13: Compatibility assessment of system components	Only Functional Safety of control system
	EN 54-18:2005 DIN EN 54-18:2006-03	Fire detection and fire alarm systems - Part 18: Input/output devices	Only Functional Safety of control system
	NFPA 72:2013	National Fire Alarm and Signaling Code	Only Functional Safety of control system
1. Functional Safety 1.2 Application-specific procedures	EN 50271:2010 DIN EN 50271:2011-04 VDE 0400-21:2011-04	Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen - Requirements and tests for apparatus using software and/or digital technologies	Only Functional Safety
1.2.5 Gas detectors	EN 50402:2005 + A1:2008 DIN EN 50402:2009-01 VDE 0400-70:2009-01	Electrical apparatus for the detection and measurement of combustible or toxic gases or vapours or of oxygen - Requirements on the functional safety of fixed gas detection systems	Only Functional Safety
1. Functional Safety 1.2 Application-specific procedures	DO-178B:1992 DO-178C:2011	Software Considerations in Airborne Systems and Equipment Certification	Only Functional Safety
1.2.7 Aerospace	DO-330:2011	Software Tool Qualification Considerations	Only Functional Safety
	DO-254:2000	Design assurance guidance for airborne electronic hardware	Only Functional Safety
1. Functional Safety 1.2 Application-specific	EN 50128:2011 DIN EN 50128:2012-03 VDE 0831-128:2012-03	Railway applications - Communication, signalling and processing systems - Software for railway control and protection systems	Only Functional Safety

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
procedures 1.2.8 Railway	EN 50129:2003 DIN EN 50129:2003-12 VDE 0831-129:2003-12	Railway applications - Communications, signalling and processing systems - Safety related electronic systems for signalling	Only Functional Safety
	IEC 62279:2002-09	Railway applications - Communications, signalling and processing systems - Software for railway control and protection systems	Only Functional Safety
	IEC 62425:2007-09	Railway applications - Communication, signalling and processing systems - Safety related electronic systems for signalling	Only Functional Safety
	IEC 62278:2002-09	Railway applications - Specification and demonstration of reliability, availability, maintainability and safety (RAMS)	Only Functional Safety
	EN 50126-1:1999 DIN EN 50126:2000-03	Railway applications - The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 1: Basic requirements and generic process	Only Functional Safety
	DIN EN 50126:2000-03 + Corrigendum 1:2006-09 + DIN EN 50126 Corrigendum 2:2011 VDE 0115-103:2000-03 + Corrigendum 1:2006-09 + VDE 0115-103 Corrigendum 2:2011	Railway applications - The specification and demonstration of reliability, availability, maintainability and safety (RAMS)	Only Functional Safety
	IEC 60571:2012-09 EN 50155:2007 + CENELEC-Cor.:2010 DIN EN 50155:2008-03 + Corrigendum 1:2010-11 VDE 0115-200:2008-03 + Corrigendum 1:2010-11	Railway applications - Electronic equipment used on rolling stock	Only Functional Safety
	IEC 62280:2014	Railway applications - Communication, signalling and processing systems - Safety related communication in transmission systems	Only Functional Safety
1. Functional Safety 1.2 Application-	IEC 60335-1:2014 EN 60335-1:2012 DIN EN 60335-1:2012-10 VDE 0700-1:2012-10	Household and similar electrical appliances - Safety - Part 1: General requirements	In regards to evaluation of Functional Safety

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
specific procedures 1.2.9 Electrical devices for household	IEC 60730-1:2013 EN 60730-1:2011 DIN EN 60730-1:2012-10 VDE 0631-1:2012-10	Automatic electrical controls for household and similar use - Part 1: General requirements	As far as relevant for electrical / electronic / programmable electronic safety units
2. Safety of machinery	ISO 12100:2010 DIN EN ISO 12100:2011-03	Safety of Machinery - General principles for design - Risk assessment and risk reduction	
	IEC 60204-1:2005 EN 60204-1:2006 DIN EN 60204-1:2007-06 + Corrigendum 1:2010-05 VDE 0113-1:2007-06 + Corrigendum 1:2010-05	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	Only Functional Safety
	ISO 13849-1:2015-12 EN ISO 13849-1:2008 DIN EN ISO 13849-1:2008-12	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design	
	EN ISO 13849-2:2012 DIN EN ISO 13849-2:2013-02	Safety of machinery - Safety-related parts of control systems - Part 2: Validation	
	IEC 62061:2005 + A1:2012 EN 62061:2005 + A1:2013 DIN EN 62061:2013-09 VDE 0113-50:2013-09	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	
	IEC 61496-1:2004, mod. + A1:2007 + Corrigendum:2008 EN 61496-1:2004 + A1:2008 DIN EN 61496-1:2009-03 + Corrigendum 1:2010-05 VDE 0113-201:2009-03 + Corrigendum 1:2010-05	Safety of machinery - Electro-sensitive - protective equipment - Part 1: General requirements and tests	Only Functional Safety
	IEC 61496-2:2006 CLC/TS 61496-2:2006 DIN CLC/TS 61496-2:2008-02 VDE V 0113-202:2008-02	Safety of machinery - Electro-sensitive protective equipment - Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)	Only section 5

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
	ISO 13850:2006 DIN EN ISO 13850:2008-09	Safety of machinery - Emergency stop - Principles for design	Evaluation in regards to Functional Safety
	ISO 13851:2002-03 EN 574:1996 + A1:2008 DIN EN 574:2008-12	Safety of machinery - Two-hand control devices - Functional aspects - Principles for design	
	ISO 13854:1996-12 EN 349:1993 + A1:2008 DIN EN 349:2008-09	Safety of machinery - Minimum gaps to avoid crushing of parts of the human body	Evaluation in regards to Functional Safety
	ISO 13855:2010 EN ISO 13855:2010 DIN EN ISO 13855:2010-10	Safety of machinery - Positioning of safeguards with respect to the approach speeds of parts of the human body	Evaluation in regards to Functional Safety
	ISO 13857:2008 EN ISO 13857:2008 DIN EN ISO 13857:2008-06	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs	Evaluation in regards to Functional Safety
	ISO 14118:2000-09 EN 1037:1995 + A1:2008 DIN EN 1037:2008-11	Safety of machinery - Prevention of unexpected start-up	Only Functional Safety
	ISO 14120:2002-02 DIN EN 953:2009-07	Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards	Evaluation in regards to Functional Safety
	EN 692:2005 + A1:2009 DIN EN 692:2009-10 + Corrigendum 1:2012-10	Machine tools - Mechanical presses - Safety	Only control system
	EN 693:2001 + A2:2011 DIN EN 693:2011-11	Machine tools - Safety - Hydraulic presses	Only control system
	NFPA 79:2012	Electrical Standard for Industrial Machinery	Only control system
	IEC 61800-5-2:2007 EN 61800-5-2:2007 DIN EN 61800-5-2:2008-04 VDE 0160-105-2:2008-04	Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional	
	ISO/TR 24119:2015	Safety of machinery - Evaluation of fault masking serial connection of interlocking devices associated with guards with potential free contacts	

Test area	Norm / Standard	Title of standard or procedure	Test area / restriction
	ISO 14119:2013 EN ISO 14119:2013 DIN EN ISO 14119:2014-03	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection	

**Abbreviations:**

ANSI/ISA	American National Standards Institute / Industry Standard Architecture
DIN	Deutsches Institut für Normung e.V.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Organization for Standardization
NFPA	National Fire Protection Association
UL	Underwriters Laboratories
VDE	Verband der Elektrotechnik
VDI	Verein Deutscher Ingenieure