Sicherheitstechnische Ausrüstung von Maschinen in China

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Worauf müssen Exporteure achten?

Fachveranstaltung BGHM
Maschinen – Sicherheit in Konstruktion und Betrieb

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Erlangen, 2014-06-27

Unternehmen

- 1948 gegründetes Unternehmen der Automatisierungstechnik
- Hauptsitz in Ostfildern bei Stuttgart
- Mitarbeiter:
  - Ca. 1.800 weltweit
- Umsatz 2013:
  - 233 Millionen Euro
  - 68,2 % Export

BLUECOMPETENCE Alliance Member
Partner der Nachhaltigkeitsinitiative des Maschinen- und Anlagenbaus

BRANDS OF THE CENTURY pilz THE CONTROL TECHNOLOGY

TOP NATIONALER ARBEITGEBER 2014 FOCUS DEUTSCHLANDS BESTE ARBEITGEBER IM VERGLEICH In Kooperation mit: kununu

DAkkS Deutsche Akkreditierungsstelle D-IS-12033-01-01

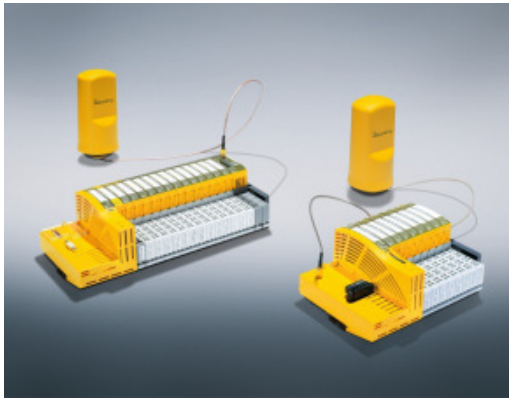
Komponenten für die Automatisierung

Sensorik

Steuerungstechnik

Antriebstechnik

Netzwerke



Bedien- und Visualisierungssysteme

Software

Ganzheitliche Lösungen in allen Branchen

Verpackungstechnik

Automotive

Transport/Logistik

Bahntechnik

Vergnügungsparks

Windenergie

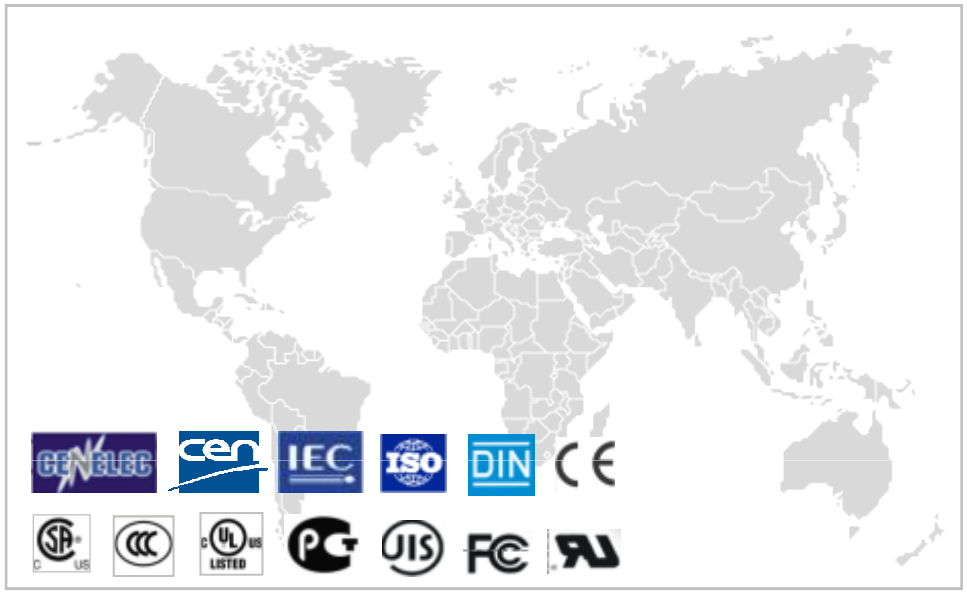
Global Player

- Know-How der weltweiten und lokalen Normen, Richtlinien und Gesetze
- Kurze Lieferzeiten
- Schneller Support vor Ort

Vor Ort vertreten durch:

- 31 Niederlassungen
- 15 Handelspartner

Der Sicherheitsmarkt



Weltweit ein Schutzziel, jedoch lokal unterschiedliche Implementierung:

- Internationale Normen
- Nationale und internationale Zulassungen
- Zertifizierungen durch externe Stellen z.B. BG, UL, KOSHA,..
- Stabile und effiziente Prozesse (ISO Zertifizierungen)

Sicherheit = Vertrauen

Maschinenaußenhandel
VDMA Report April 2014

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Deutscher Maschinenaußenhandel

Januar - April 2014

Export	Mio. EUR	2014/13 in %	%-Anteil	Import	Mio. EUR	2014/13 in %	%-Anteil
nach Absatzländern				nach Herkunftsländern			
1. China	5.293,0	-0,7	11,0	1. Italien	1.831,3	-5,1	9,6
2. USA	4.673,1	3,6	9,7	2. Schweiz	1.721,3	10,7	9,1
3. Frankreich	3.235,4	-4,4	6,7	3. China	1.524,0	13,0	8,0
4. Verein. Königreich	2.133,7	7,5	4,4	4. Frankreich	1.465,5	-0,9	7,7
5. Russland	2.129,5	-18,8	4,4	5. USA	1.343,5	-5,3	7,1
6. Österreich	1.859,8	-4,8	3,9	6. Österreich	1.177,0	-5,9	6,2
7. Italien	1.840,9	-2,5	3,8	7. Japan	1.071,5	-1,0	5,6
8. Niederlande	1.840,1	3,4	3,8	8. Tschechien	1.065,9	-1,5	5,6
9. Schweiz	1.629,5	0,4	3,4	9. Niederlande	796,3	-3,0	4,2
10. Polen	1.392,6	-3,4	2,9	10. Verein. Königreich	721,5	-2,2	3,8
11. Tschechien	1.271,2	6,4	2,6	11. Polen	642,2	-6,6	3,4
12. Belgien	1.171,1	13,0	2,4	12. Ungarn	622,5	-3,6	3,3
13. Türkei	1.150,5	-13,2	2,4	13. Schweden	508,7	-7,2	2,7
14. Spanien	1.128,4	9,7	2,3	14. Belgien	441,9	-2,5	2,3
15. Schweden	912,9	-3,2	1,9	15. Slowakei	440,3	10,1	2,3
16. Republik Korea	865,5	-17,7	1,8	16. Dänemark	393,1	35,8	2,1
17. Ungarn	782,7	5,5	1,6	17. Spanien	335,8	0,2	1,8
18. Indien	763,6	-13,4	1,6	18. Rumänien	303,2	9,5	1,6
19. Brasilien	725,3	-22,4	1,5	19. Türkei	255,1	3,8	1,3
20. Saudi-Arabien	693,5	-7,9	1,4	20. Rep. Südafrika	241,4	-2,8	1,3

Quelle: VDMA Außenhandelsreport 04/2014

Exporte der deutschen Maschinenbauindustrie nach China in den letzten beiden Jahren rückläufig.

2013 lieferten die deutschen Unternehmen Maschinen und Anlagen im Wert von rund **141 Milliarden RMB** ins ‚Reich der Mitte'.

Damit blieb China, trotz des Rückgangs um **3,7 Prozent** (zu 2012), **weiterhin wichtigster Absatzmark**

Im ersten Drittel 2014 liegt der Rückgang bei **0,7 %** zum Vorjahr

Was sollten Maschinenbauer wissen? Abgrenzung CE / CCC

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•Konzeption nach Maschinenrichtlinie und „CE- Kennzeichnung“ reicht in China nicht automatisch aus, um dort eine Maschine in Verkehr zu bringen.

CE

•China hat eigene Standards die **verpflichtend** anzuwenden sind → „*Normenrecherche notwendig*“

STANDARDS PRESS OF CHINA
GB

CCC

CCC = China Compulsory Certification ist ein gesetzlich vorgeschriebenes Zertifizierungssystem

•Produkte für die CCC-Zertifizierung müssen die chinesischen Normen und / oder anderen zusätzlichen technischen Anforderungen entsprechen.

Das CCC-System basiert auf den chinesischen GB-Standards.

Ob ihr Produkt unter die Kategorie CCC Mark fällt stellen Sie über den „Tarifcode" oder "HS-Code" fest.

Was sollten Maschinenbauer wissen? CCC

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•Produkte für die CCC-Zertifizierung müssen die chinesischen Normen und / oder anderen zusätzlichen technischen Anforderungen entsprechen.
•in Kraft seit Mai 2002, Produkt-Zertifizierung seit August 2003

Es ist aktuell **nicht geplant**, Maschinen generell mit dem „CCC“ zu kennzeichnen sind oder einer CCC-Prüfung unterzogen werden müssen.

Aber: ***Verwendete Bauteile/Komponenten (Erstzteile) sollten für den chinesischen Markt „zugelassen“ sein und ein „CCC-Zeichen“ tragen! → Recherche notwendig?***

Das CCC-System basiert auf den chinesischen GB-Standards.

Bei Nichtbeachtung der CCC-Bestimmungen werden die Einfuhrgüter an der Grenze festgehalten oder an den Absender zurückgeschickt.

Bei unsachgemäßer Benutzung einer CCC-Genehmigung oder bei der CCC-Markierung von Produkten ohne Zertifikat drohen u.a. **hohe Geldstrafen** und Gerichtsverfahren bei der Einfuhr nach China. *Auch wenn manche Produkte eigentlich kein CCC benötigen, kann es dennoch zu Zollproblemen kommen, wenn der Zoll ein CCC-Zertifikat fordert. Negativbescheinigungen für diese Güter reduzieren das Risiko von Zollproblemen deutlich.*

Von der chinesischen Zentralbehörde CNCA (Certification and Accreditation Administration) wird das CCC-Zertifikat verwaltet.
Das CQC (China Quality Certification Centre) ist für die Durchführung der Zertifizierung verantwortlich.

China Machinery Safety Standards Overview

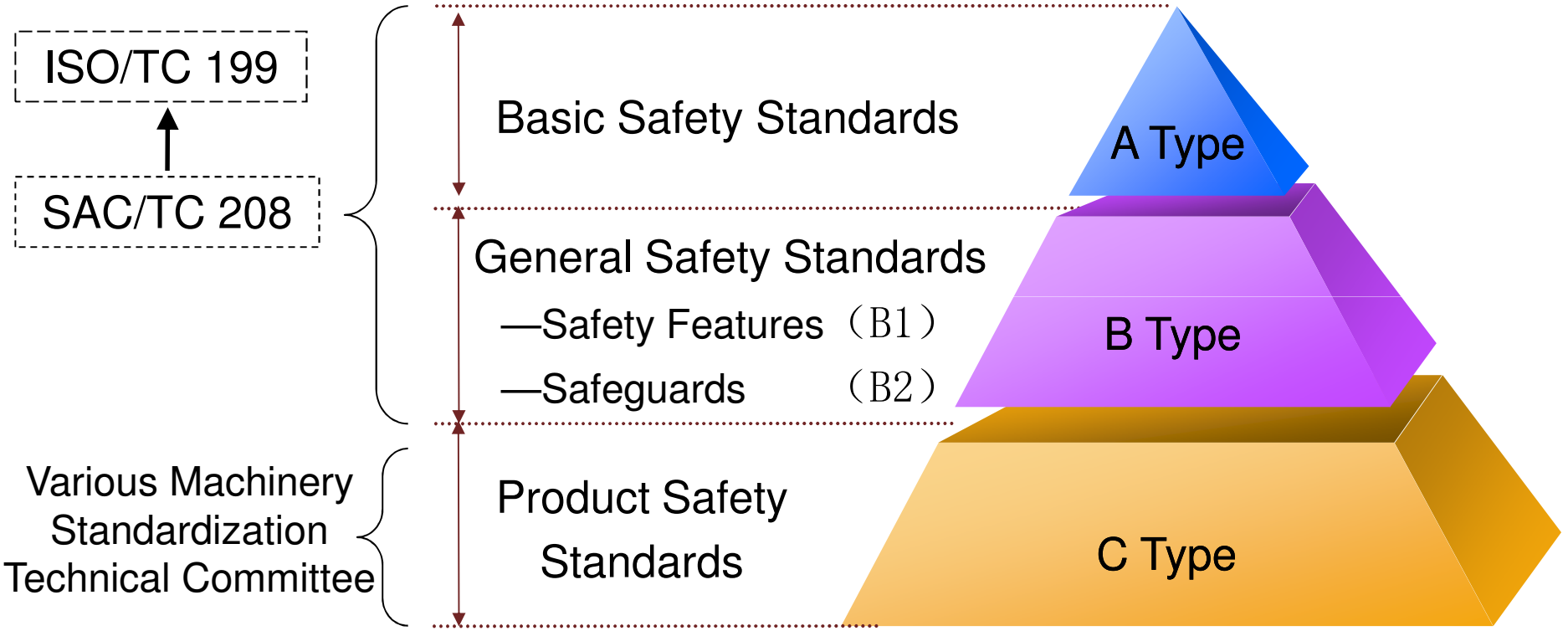
No.	Code	Content	Competent Dept.
1	GB	Mandatory National Standards	Standardization Administration of the People's Republic of China
2	GB/T	Voluntary National Standards	Standardization Administration of the People's Republic of China
3	GB/Z	National Standardization Guiding Technical Documents	Standardization Administration of the People's Republic of China

http://www.sac.gov.cn/

Chinese Standards are divided into mandatory standards and voluntary standards.

Standards concerning protection of human health, personal property and safety and those enforced by laws and administrative regulations are mandatory standards, others are voluntary standards.

China Machinery Safety Standards Overview
Machinery Safety Standards Structure



China Machinery Safety Standards Overview

SAC/TC 208 National Technical Committee on Safety of Machinery of Standardization Administration of China

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➢Background

（SAC/TC 208） founded in 1994, directly under the authority of Standardization Administration of the PRC, Its secretary office is in China Productivity Center for Machinery of the China Academy of Machinery Science & Technology

➢Committee Organization

composed of 43 experts from scientific research institutions, colleges, quality inspection organization, certification body and enterprises.

Pilz China is one of the members.

China Machinery Safety Standards Overview

SAC/TC 208 National Technical Committee on safety of Machinery of Standardization Administration of China

➢Main Duties：

——Responsible for the standardization of machinery safety basic standards(A type) and general standards(B Type), and management work of ISO/TC199

——Responsible for the enactment and revision of A type and B type standards including the standard of safety related parts of control system.

——Responsible for the propagation, implementation and explanation of A type and B type standards

——Coordinate the relations and consistency problems of C type (special equipments) and A type, B type standards

——As member of ISO/TC 199,representing China take part in its international standards enactment and revision and various standardization events

——Dissemination Standards: 47 machinery safety standards

China Machinery Safety Standards Overview

Machinery products standardization technical committee

➢ Various machinery products standardization technical committee are responsible for C type standards

For Example：

——National Technical Committee for standardization of Press Machines

——National Technical Committee for standardization of Rubber Plastic Machines

——National Technical Committee for standardization of Packaging Machines

——National Technical Committee for standardization of Printing Machines

——National Technical Committee for standardization of Metal Cutting Machines

——……

China Machinery Safety Standards Overview

Machinery safety standards list—A type

Cat	Chinese Standard	Name (English)	International Standard	EU Standard
A	**GB/T 15706.1-2007**	**Machinery safety Basic concepts and design principles Part I: basic terminology and methods**	**ISO 12100-1-2003**	**EN ISO 12100-1:2003/A1:2009**
A	GB/T 15706.2-2007	Machinery safety Basic concepts and design principles Part 2: Technical basic terminology and method	ISO 12100-2-2003	EN ISO 12100-2:2003/A1:2009
A	GB/T 16856.1-2008	Machinery safety Risk Assessment Part1: Principles	ISO 14121.1-2007	EN ISO 14121-1:2007
A	GB/T 16856.2-2008	Machinery safety Risk Assessment Part2: Implementation guide and examples	ISO/TR 14121.2-2007	
A	GB 5226.1-2008	Machinery electrical safety Machinery electrical equipment Part 1:General technical conditions	IEC 60204-1-2005(2009)	EN 60204-1-2006

China Machinery Safety Standards Overview

Machinery safety standards list—B type

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Cat	Chinese Standard	Name (Chinese)	International Standard	EU Standard
B1	GB 12265.3-1997	Machinery safety Minimum gaps to avoid crushing of parts of the human body	ISO 13854-1996	EN 349:1993+A1:2008
B1	GB 23821-2009	Machinery safety Safety distances to prevent hazard zones being reached by upper and lower limbs	ISO 13857-2008	EN ISO 13857:2008
B1	GB/T 19876-2005	Machinery safety Positioning of protective equipment with respect to the approach speeds of parts of the human body	ISO 13855:2010	EN ISO 13855-2010
B2	GB 19436.3-2008	Machinery electrical safety Electro-sensitive protective equipment Part 3: Particular requirements for active opto-electric protective devices responsive to Diffuse Reflection(AOPDDR)	IEC 61496-3-2001(2008)	EN 61496-3-2001
B2	GB/T 17454.1-2008	Machinery safety Pressure-sensitive protective devices Part 1:General principles for design and testing of pressure-sensitive mats and pressure-sensitive floors	ISO 13856-1-2001	EN 1760-1:1997+A1:2009

China Machinery Safety Standards Overview

Machinery safety standards list—B type （Continuous）

Cat	Chinese Standard	Name (Chinese)	International Standard	EU Standard
B2	GB/T 17454.2-2008	Machinery safety Pressure-sensitive protective devices Part 2:General principles for the design and testing of pressure-sensitive edges and pressure-sensitive bards	ISO 13856-2-2005	EN 1760-2:2001+A1:2009
B2	GB/T 17454.3-2008	Machinery safety Pressure-sensitive protective devices Part 3:General principles for design and testing of pressure-sensitive bumpers, plates,wires and similar devices	ISO 13856-3-2006	EN 1760-3:2004+A1:2009
B2	GB/T 19436.1-2004	Machinery electrical safety Electro-sensitive protective equipment Part 1: General Requirements and tests	IEC 61496-1:1997(2008)	EN 61496-1:2004
B2	GB/T 19671-2005	Machinery safety Two-hand control devices Functional aspects and design principles	ISO 13851:2002	EN 574:1996+A1:2008

China Machinery Safety Standards Overview

Machinery safety standards list—B type （Continuous）

Cat	Chinese Standard	Name (Chinese)	International Standard	EU Standard
B2	GB/T 8196-2003	Machinery safety Guards general requirements for the design and construction of fixed and movable guards	ISO 14120-2002	EN 953:1997+A1:2009
B2	GB/T 18831-2010	Machinery safety Interlocking devices associated with guards—principles for design and selection	mod ISO 14119-1998	EN1088:1995+A2:2008
B2	GB 16754-2008	Machinery safety Emergency stop Principles for design	ISO 13850：2006	EN ISO 13850:2008
B2	**GB/T 16855.1-2008**	**Machinery safety Safety-related parts of control systems Part 1:General principles for design**	**ISO 13849-1-2006**	**EN 13849-1:2007**
B2	GB/T16855.2-2007	Machinery safety Safety-related parts of control systems Part 2: Validation	ISO 13849-2-2003	EN ISO 13849-2-2008
B2	GB/T 19670-2005	Machinery safety Prevention of unexpected start-up	ISO 144118:2000	EN1037:1995+A1:2008
B2	GB 17888.1-2008	Machinery safety Permanent means of access to machinery Part 1: Choice of a fixed means of access between two levels	ISO 14122-1-2001	EN ISO 14122-1-2001

China Machinery Safety Standards Overview

Machinery safety standards list—B type （Continuous）

Cat	Chinese Standard	Name (Chinese)	International Standard	EU Standard
B2	GB 17888.2-2008	Machinery safety Permanent means of access to mahines and industrial plants Part 2: Working platforms and gangways	ISO 14122-2-2001	EN ISO 14122-2-2001
B2	GB 17888.3-2008	Machinery safety Permanent means of access to machines and industrial plants Part 3:Stairways,stepladders and guard-rail	ISO 14122-3-2001	EN ISO 14122-3-2001
B2	GB 17888.4-2008	Machinery safety Peranent means of access to machinery Part 4: Fixed ladders	ISO 14122-4-2004	EN ISO 14122-4-2004
B2	GB/T 3766-2001	Hydraulic fluid power General rules for the application of equipment to transmission and control systems	ISO 4413-1998	EN 982:1996+A1:2008
B2	GB/T 7932-2003	Pneumatic fluid power General rules for the application of equipment to transmission and control systems	ISO 4414:1998	EN 983:1996+A1:2008
B2	GB 18209.2-2010	Machinery safety Indication,marking and actuation Part 2:Requirements for marking	IEC 61310-2-1995(2007)	EN 61310-2:2008
B2	GB 23819-2009	Machinery safety Fire prevention and protection	ISO 19353-2005	EN 13478:2001+A1:2008

Comparison between China and European Standards （Continuous）

Description	China Machinery Safety Standards	European Machinery Safety Standards
Structure	A，B，C 3 types	A，B，C 3 types
Content	Some standards are identical to and some are referred to European standards	N/A
Features	Mandatory and voluntary	Harmonized Standards
Compliance Audit	GB mandatory standards are audited by quality supervision, inspection organizations which is one government department. But lack of law support lead to weak audit and execution	Through conformity of EC declaration
Inspection/Approval	Inspection Labs such as quality supervision and inspection centre（CNAS* authorized）	Notified Body
Safety Related Parts of Control System	GB/T 16855-1-2 which is voluntary standard and identical to EN ISO 13849	EN ISO 13849-1-2

*China National Accreditation Service for Conformity Assessment

Special Equipments with Mandatory Standard

Machinery safety standards list—C type

Cat	Chinese Standard	Name (Chinese)	International Standard	EU Standard
C	GB 18452-2001	Crusher equipment safety requirements		
C	GB 18490-2001	Laser processing machines--Safety requirements	ISO 11553:1996	
C	GB 18956-2003	Safety of woodworking machines--Surface planing and thicknessing machines		EN 861:1997
C	GB 22997-2008	Safety of machine tools - Small numerically controlled turning machines and turning centres		EN 12415:2000
C	GB 27607-2011	Mechanical press - Safety requirements		

Special Equipments with Mandatory Standard

Machinery safety standards list—C type

Cat	Chinese Standard	Name (Chinese)	International Standard	EU Standard
C	GB 28240-2012	Shears - Safety requirements		
C	GB 28243-2012	Hydraulic press brakes - Safety requirements		
C	GB 28244-2012	Automatic metalforming machinery - Safety requirements		
C	GB 28242-2012	Screw presses - Safety requirements		
C	GB 17120-2012	Metalforming machinery - Safety requirements		
C	GB 28760-2012	Tube bending machine - Safety requirements		
C	GB 28755-2012	Safety rules for simple lifts		

Special Equipments with Mandatory Standard

Machinery safety standards list—C type （Continuous）

Cat	Chinese Standard	Name (Chinese)	International Standard	EU Standard
C	GB 30458-2013	Safety requirement of plate bending machine		
C	GB 28241-2012	Hydraulic presses - Safety requirements		
C	GB 22530-2008	Safety requirements of injection moulding machines for rubber and plastics		EN 201:1997
C	GB 25433-2010	Safety requirements of rubber internal mixers & plastics internal mixers		EN 12013:2000
C	GB 25431.1-2010	Extruders and extrusion lines for rubber and plastics - Part 1: Safety requirements for extruders		EN 1114-1:1996
C	GB 25432-2010	Safety requirements of daylight press		EN 289:2004
C	GB 25431.3-2010	Extruders and extrusion lines for rubber and plastics - Part 3：Safety requirements for haul-offs		EN 1114-3:2001

Special Equipments with Mandatory Standard

Machinery safety standards list—C type （Continuous）

Cat	Chinese Standard	Name (Chinese)	International Standard	EU Standard
C	GB 25431.2-2010	Extruders and extrusion lines for rubber and plastics - Part 2 :Safety requirements for die face pelletizers		EN 1114-2:1998
C	GB 25936.4-2010	Plastics and rubber machines - Size reduction machines - Part 4: Safety requirements for agglomerators		EN 12012-4:2006
C	GB 25936.1-2012	Rubber and plastics machines - Size reduction machines - Part 1: Safety requirements for blade granulators		EN 12012-1:2007
C	GB 25936.2-2012	Rubber and plastics machines - Size reduction machines - Part 2: Safety requirements for strand pelletisers		EN 12012-1:2001+A2:2008
C	GB 25936.3-2012	Rubber and plastics machines - Size reduction machines - Part 3: Safety requirements for shredders		EN 12012-3:2001+A1:2008

Special Equipments with Mandatory Standard

Machinery safety standards list—C type （Continuous）

Cat	Chinese Standard	Name (Chinese)	International Standard	EU Standard
C	GB 16655-2008	Safety of machinery - Integrated manufacturing systems - Basic requirements	ISO 11161:2007	
C	GB 11291.1-2011	Robots for industrial environments - Safety requirements - Part 1: Robot	ISO 10218-1:2006,ISO 10218-1/Cor.1:2007	
C	GB 11291.2-2013	Robots and robotic devices—Safety requirements for industrial robots—Part 2: Robot systems and integration	ISO 10218-2:2011	

Industrial Standards for Special Equipments

Injection Moulding Machines

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- Standard No.: GB 22530-2008 Safety requirements of injection moulding machines for rubber and plastics

- Adopted International Standard No.：EN 201：1997(Application Degree: Not Equivalent)

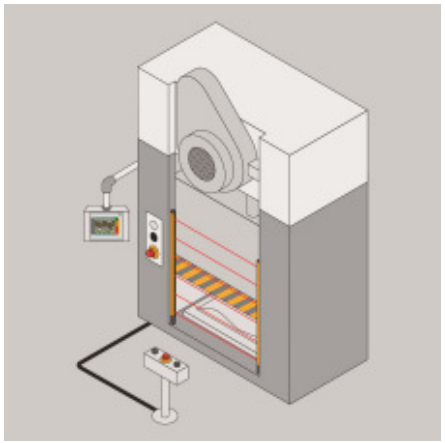
- Technical Committee： National Technical Committee for standardization of Rubber Plastic Machines（SAC/TC 71)

- Standard Features：Chapter 5 Safety requirements and measures, Chapter 6 Validation of safety requirements and measures, Chapter 7 information for use, above 3 chapters are mandatory, and others are voluntary

- Standard Execution: Since the standard come into effective in 2008,local injection moulding machine manufacturers, take Haitian for example, has strictly follow the standard. Some machine builders are considering safety related parts of control system such as safety relay in safety interlock.

Industrial Standards for Special Equipments

Mechanical Press



- Standard No.: GB 27607-2011 Mechanical Press Safety requirements

- Partly Adopted：EN 692

- Technical Committee: National Technical Committee for standardization of Metalforming Machines（SAC/TC220)

- Standard Features: Chapter3 Terminology, Attribute and Abbreviations, Chapter 4 Severe Hazards, above 2 chapters are voluntary and others are mandatory. The key part is Chapter 5 Safety requirements and (or) measures.

- Standard Execution: Leading manufacturers such as Yangli has already designed and produced the prototype machine that meets the requirements of the standard. But due to industrial depression in recent years, and increased cost of standard application lead to most manufacturers take a wait-and-see attitude, thus it will take some time for widely application of the standard in whole industry.

Industrial Standards for Special Equipments

Machine Tools

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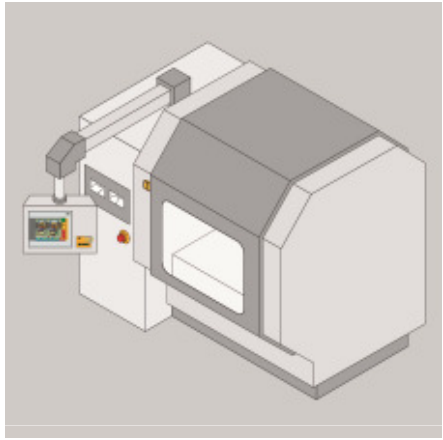
- Standard No.：GB 22998-2008 Safety of machine tools Large numerically controlled turning machines and turning centres

- Adopted International Standard No.:EN 12478：2000

- Technical Committee: National Technical Committee for standardization of Metal-cutting Machines(SAC/TC 22)

- Standard Features:5.3.1 Exhalation and 5.3.3 Ergonomics are voluntary and others are mandatory

- Standard Execution: Weak execution due to low industrial added-value



Industrial Standards for Special Equipments

Robots

➢Standard No.：

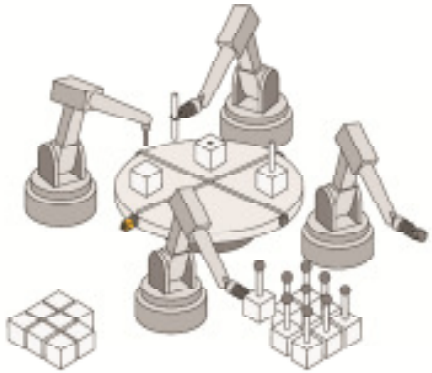
GB 11291.1-2011 Robots for industrial environments Safety requirements Part 1:Robot

GB 11291.2-2013 Robots and robotic devices Safety requirements for industrial robots Part 2: Robot systems and integration

➢Adopted International Standard No.： EN 10218(Identical)

➢Technical Committee: National Technical Committee for standardization of Automation systems and integration

➢Standard Execution: weak



Summary

➢C type standards are developed by various technical committee of industrial associations. Some special equipments have mandatory standards of safety requirements, such as mechanical press and injection moulding machine.

➢Government department, Quality Supervision and Inspection Administration, is the audit and inspection organization. Generally, it's random inspection in small probability by this organization. Once random inspection comes, the right inspection Lab/quality supervision and inspection centre should be found to get the certification of conformity of relative GB standard.

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Topics

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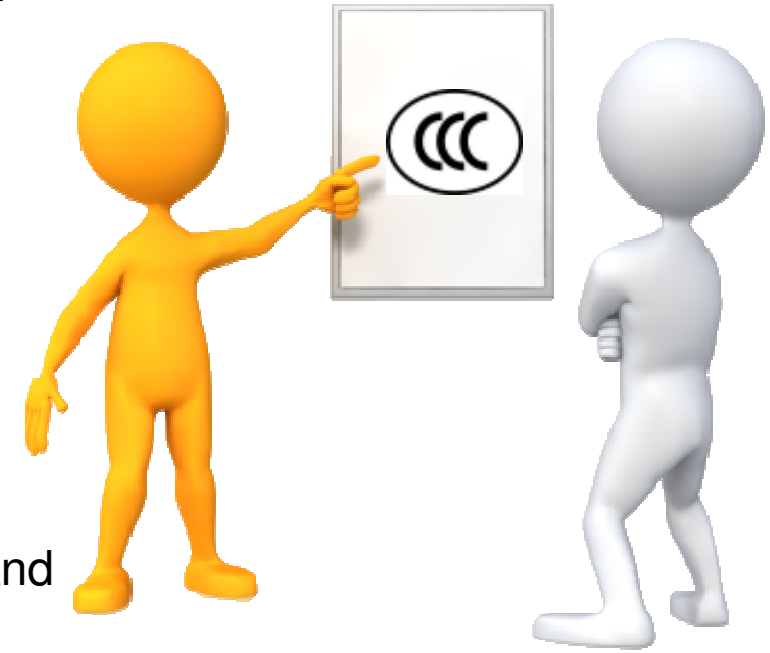
- China Machinery Safety Standards Overview
- Comparison between China and European Standards
- Industrial Standards for Special Equipments
- CCC Introduction
- CCC Certification Process

CCC Introduction

CCC or 3C = China Compulsory Certification



It is the statutory compulsory safety certification system and the basic approach to safeguard the consumers' rights and interests and protect the personal and property safety, which is adopted widely by international organizations.

CCC system came into force since May 1,2002, and the time for implementing the supervision and management of the market for compulsory product certification was decided on August 1,2003.

CCC Introduction

Quick Overview of CCC Mark

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- Currently, there are 135 products divided into 20 categories, including household appliances, motor vehicles, motorcycles, safety glasses, medical devices, lighting apparatus, cables and wires etc. that require mandatory CCC Mark

- Component parts of finished products, spare parts and replacement paers, may in some cases require CCC certification

- Products applied for CCC certification must conform to Chinese standards and/or other additional technical requirements

- The CCC system is based on the Chinese GB Standards, most of which are harmonized with international Standards

- First step is to determine if your product falls under CCC Mark category, using “TariffCode” or “HS Code” is the most efficient way to find out if a product falls under CCC Mark.

Topics

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- China Machinery Safety Standards Overview
- Comparison between China and European Standards
- Industrial Standards for Special Equipments
- CCC Introduction
- CCC Certification

CCC Certification Process

4 Basic Steps for CCC Certification

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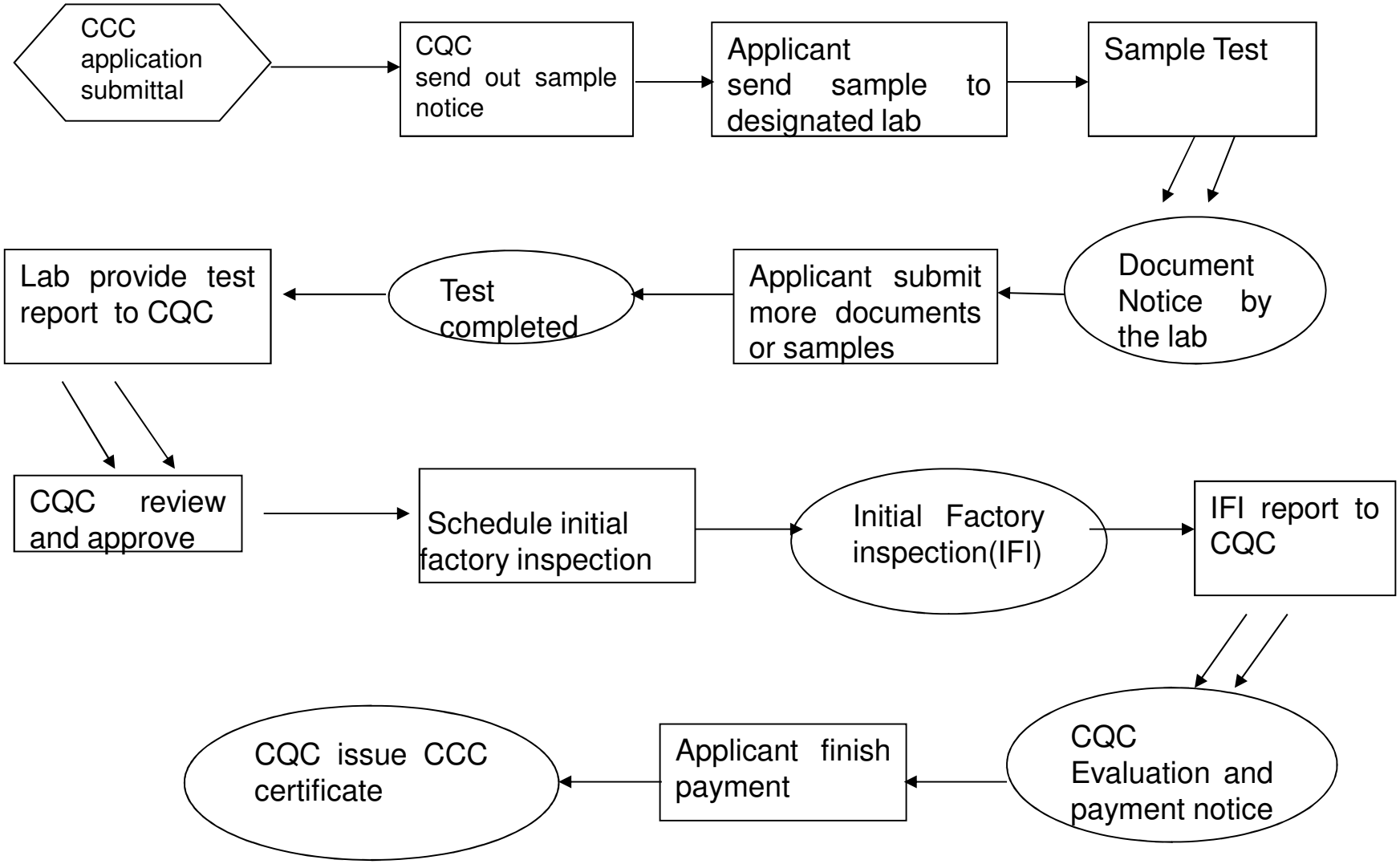
1、Documenting

2、 Submitting Samples & Testing

3、 Initial Factory Inspection (if applicable)

4、 CCC MARK and Labelling

CCC Certification Process



Zusammenfassung

•Maschinen, die nach MRL konzipiert und mit „CE“ gekennzeichnet sind erfüllen oftmals einen Großteil der Anforderungen. Dennoch GB und GB/T - Studium und Anwendung ist angeraten

•Komponenten (Ersatzteile) sollten CCC Kennzeichen tragen.

•Oftmals ist die Dokumentation in **chinesischer Sprache** notwendig. Kontrolle am Zoll

•Viele Standards wurden aus dem europäischen Normenwerk als nationale GB oder GB/T Standards übernommen (ca. 400)

Aber:
- Oft nicht identisch sondern “modifiziert“
- Nicht so aktuell wie die Europäischen
- Nicht verfügbar

Quellen/Rechercheplattformen:
http://www.standards-portal.de **(DIN Deutsch-Chinesisches Normeninformationsportal)**
http://eu-china-standards.eu **(Europe-China Standardisation Information Platform)**
http://www.sac.gov.cn **(SAC Homepage)**

Sicherheitstechnische Ausrüstung von Maschinen in China

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