

機器人與機器人系統檢測驗證服務

Testing and Certification of Robots and Robotic Systems



隨著「德國工業 4.0」和「中國製造 2025」戰略的發布，機器人和機器人製造系統將得以廣泛應用，同時其安全性也變得更加重要。

「CE」標誌是一種安全驗證標誌，被視為製造商打開並進入歐洲市場的護照。凡是貼有「CE」標誌的產品方可在歐盟各成員國內銷售，無須符合每個成員國的要求，因此實現了商品在歐盟成員國範圍內的自由流通。

同樣，機器人產品進入歐盟市場，必須合法地取得 CE 驗證標誌的使用資格，這也就意味著產品必須符合歐盟關於機械安全性（機械指令 2006/42/EC）、電磁相容性（電磁相容 EMC 指令 2014/30/EU）以及機器人協調標準（EN ISO 10218）的相關要求。

「CR」標誌是中國機器人驗證標誌，通過中國國家機器人標準檢測的機器人及其零組件，即可獲得「CR」證書。

作為歐盟正式授權的國際權威驗證機構，德國萊因 TÜV 已形成完整的、全方位的機器人檢測驗證服務系統。我們不僅可為出口企業產品提供 CE 驗證服務，同時由於德國萊因 TÜV 同中國 CR 驗證機構合作，可為國外機器人產品銷往中國市場提供 CR 驗證服務。

With the strategies of Industry 4.0 and Made in China 2025 being issued, robots and robotic manufacturing systems are to be broadly applied and meanwhile the safety for such application will be becoming more important.

“CE-mark” is a safety mark, which is symbolized as a passport to entering the European market for manufacturers. All products affixed with the “CE-mark” can be circulated in each member country of the EU without the necessity to meet the requirements of each member country respectively, thus it can realize the free trade throughout the EU member countries.

To enter the EU market, robots shall be eligible to affix the CE mark on the products legally, which means the products shall conform with the regulations relating to the safety of machinery (Machinery Directive 2006/42/EC), electromagnetic compatibility (EMC Directive 2014/30/EU) and safety requirements of robot for industrial environments (EN ISO 10218).

“CR” mark is the robot certification mark in China, and a robot or robot components passing the National Robot Standard Test can be awarded a CR certificate.

As an international independent notified body officially authorized by the EU, the industrial machine department of TÜV Rheinland Group has formed a solid, versatile, cordial and all-round services system for robot and robotic system certification. We not only provide CE certification for exported products, but also provide CR certification for overseas robotic products to enter Chinese market due to the cooperation with Chinese CR certification bodies.

德國萊因 TÜV，您值得信賴的合作夥伴 TÜV Rheinland is your reliable partner



德國萊因 TÜV 為您提供全面的品質保證，確保產品設計充分符合機器人國際標準的相關要求。

在初始階段，我們會對產品主要性能和設備要求進行評估，盡早發現概念階段的不符合標準項目，減少專案後期可能產生的修改費用。而在主檢階段，會對產品進行更加詳細的理論和實踐評估。此外還會對驗證、確認、管理文件方面進行評估。

TÜV Rheinland provides you with quality assurance to ensure that your products are adequately designed according to the international requirement about robot and robotic system.

During the initial concept review, the principal performance and requirement of the equipment are assessed. This facilitates early detection of deviations in the concept, reducing the probability of costly modifications later in the project. The main inspection phase includes more detailed theoretical and practical evaluations of the products. In addition, verification, validation, management and documentation aspects are evaluated.

測試指令和標準

Testing standards



CE

指令：

2006/42/EC 機械指令 Machinery Directive
2014/30/EU 電磁相容指令 EMC Directive

2014/34/EU ATEX 114 防爆指令 ATEX Directive
1999/92/EC ATEX 137 防爆指令 ATEX Workplace Directive

標準：

EN 60204-1 電氣安全 Safety of Machinery - Electrical Equipment of Machines
ISO 10218-1 機器人安全要求 Robots and Robotic Devices - Safety Requirements for Industrial Robots Part 1
ISO 10218-2 機器人系統安全要求 Robots and Robotic Devices - Safety Requirements for Industrial Robots Part 2
ISO 13482 個人護理機器人安全要求 Robots and Robotic Devices - Safety Requirements for Personal Care Robots
ISO 11161 機械安全 - 集成製造系統 Safety of Machinery - Integrated Manufacturing System (IMS)
ISO 15066 協同機器人 Robots and Robotic Devices - Collaborative Robots
EN 61508 功能安全 Functional Safety of Electrical/Electronic/Programmable Electronic Safety-related Systems
EN ISO 13849 控制系統性能安全 Safety of Machinery - Safety-Related Parts of Control Systems
EN 62061 電子控制系統功能安全 Safety of Machinery - Functional Safety of Safety-Related Electrical, Electronic and Programmable Electronic Control Systems
ISO 12100 風險評估與風險降低 Safety of Machinery - General Principles for Design - Risk Assessment and Risk Reduction

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UL 1740 機器人安全要求 Standard for Safety Robots and Robotic Equipment
NFPA 79 電氣要求 Electrical Standard for Industrial Machinery
ANSI/RIA R15.06 美國標準 Industrial Robots and Robot Systems
CAN/CSA-Z434 加拿大標準 Industrial Robots and Robot Systems

CR

GB 11291.1 機器人安全要求 Robots for Industrial Environments - Safety Requirements
GB 11291.2 機器人與機器人裝備 - 工業機器人的安全要求 Robots and Robotic Devices - Safety Requirements for Industrial Robots
GB 5226.1 電氣要求 Electrical Safety of Machinery - Electrical Equipment of Machines

相關標準間關係見下圖 The relationships among the associated standards are given in the table below

IEC/ISO Standards	European Standards	Chinese Standards
基礎標準 Basic Standard		
ISO 12100:2010	EN ISO 12100:2010	GB/T 15706-2012
ISO 13849-1:2015	EN ISO 13849-1:2015	GB/T 16855.1:2008 (EN ISO 13849-1:2006)
ISO 13849-2:2012	EN ISO 13849-2:2012	GB/T 16855.2:2007 (EN ISO 13849-2:2003)
ISO 14121-1:2007	EN ISO 14121-1:2007	GB/T 16855-2007 (ISO 14121:2007)
IEC 61508:2010	EN 61508:2010	GB/T 20438-2006
IEC 60204:2005 + A1:2005	EN 60204:2005 + A1:2008	GB/T 5226.1-2008 (IEC 60204-1:2005)
專用標準 Specialized Standard		
ISO 10218-1:2011	EN ISO 10218-1:2011	GB 11291.1:2011 (ISO 10218-1:2006)
ISO 10218-2:2011	EN ISO 10218-2:2011	GB 11291.2:2013 (ISO 10218-2:2011)
ISO 13482:2014	EN ISO 13482:2014	
ISO 15066:2016		
電磁相容標準 EMC Standard		
IEC 61000-6-1:2016	EN 61000-6-1:2007	GB/T 17799.1-1999
IEC 61000-6-2:2016	EN 61000-6-2:2011	GB/T 17799.2-2003
IEC 61000-6-3+A1:2011	EN 61000-6-3:2012 + A1 + AC	GB/T 17799.3-2012
IEC 61000-6-4+A1:2011	EN 61000-6-4:2011	GB/T 17799.4-2012

我們的服務

Our services

產品檢測 Product testing

對下述產品進行安全、性能、可靠性、壽命、功能檢測出具試驗報告：

The following products are tested for safety, performance, reliability, service lifetime and function with a test report provided:

- 機器人 Robots
- 伺服電機 Servo motors
- 控制器 Controllers
- 減速機 Gear reducer
- 感測器 Sensors
- 系統集成 Integrated systems
- 電纜 Cables

現場安全評估 On-site safety assessment

對機器人生產現場、生產線、生產車間進行電氣、機械、火災、爆炸、有害物質等進行安全評估、危險性分析，確保生產現場無潛在危險，同時提供整改建議。

For robot manufacture sites, product lines, and workshops, a safety assessment is performed in terms of electrical equipment, machineries, fires, explosion and hazard substances. Risks are analyzed to ensure on-site safety and corrective recommendations are provided.

產品驗證 Product certification

機器人和機器人系統相關的產品驗證服務 Robot and robotic system related certification services

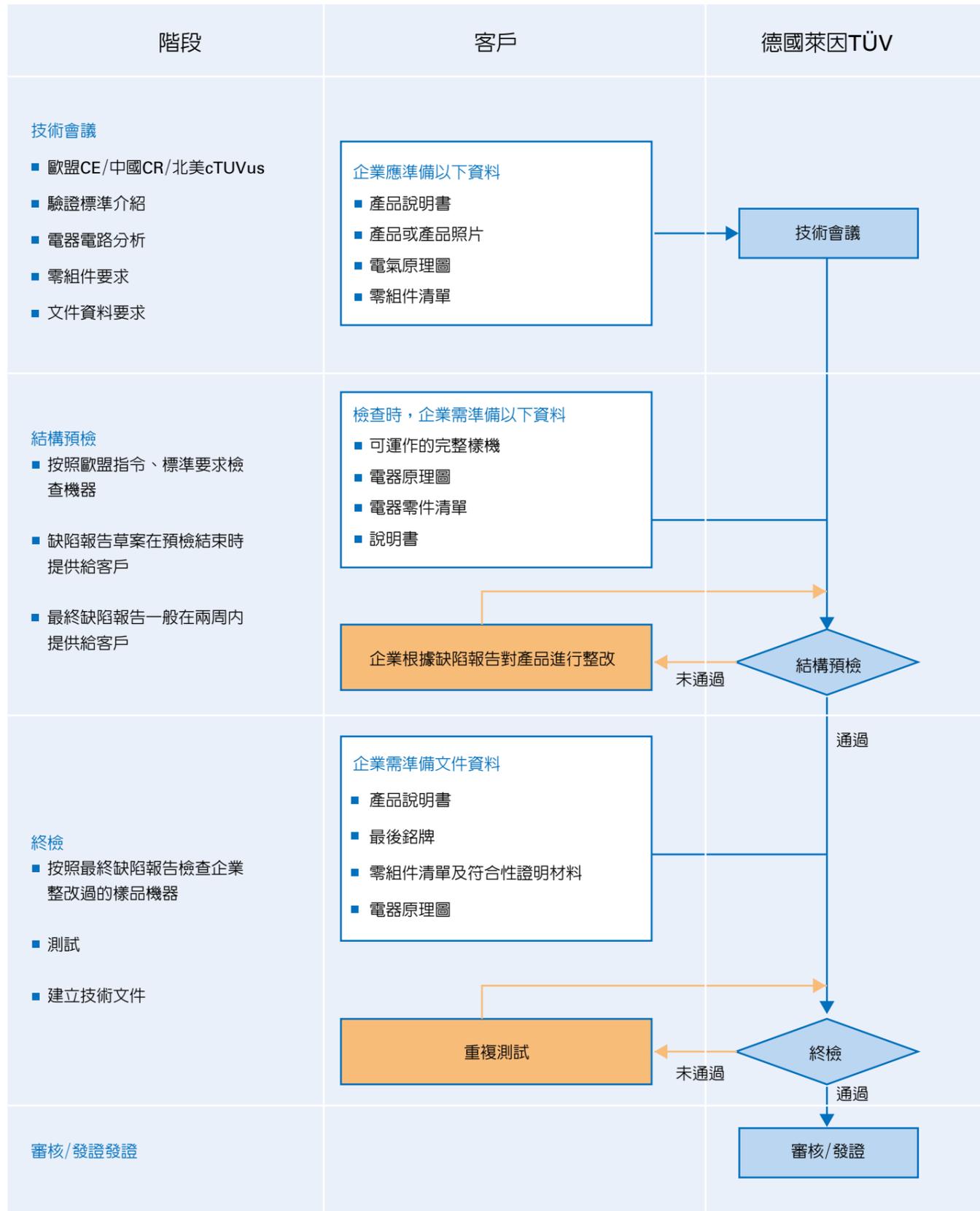
- CE 機械指令驗證
- CE 電磁相容 EMC 驗證
- 功能安全管理系統審核
- 安全完整性等級 (SIL) 或性能完整性 (PL) 判定
- ATEX/IECEX 防爆驗證
- 其他相關測試及驗證
- CE Machinery Directive certification
- CE EMC certification
- Functional safety management system audit
- Determination of safety integrity level (SIL) or performance level (PL)
- ATEX/ IECEx explosion proof certification
- Other related tests and certification

機械和電氣安全工程師培訓 Mechanical and electrical safety engineer training

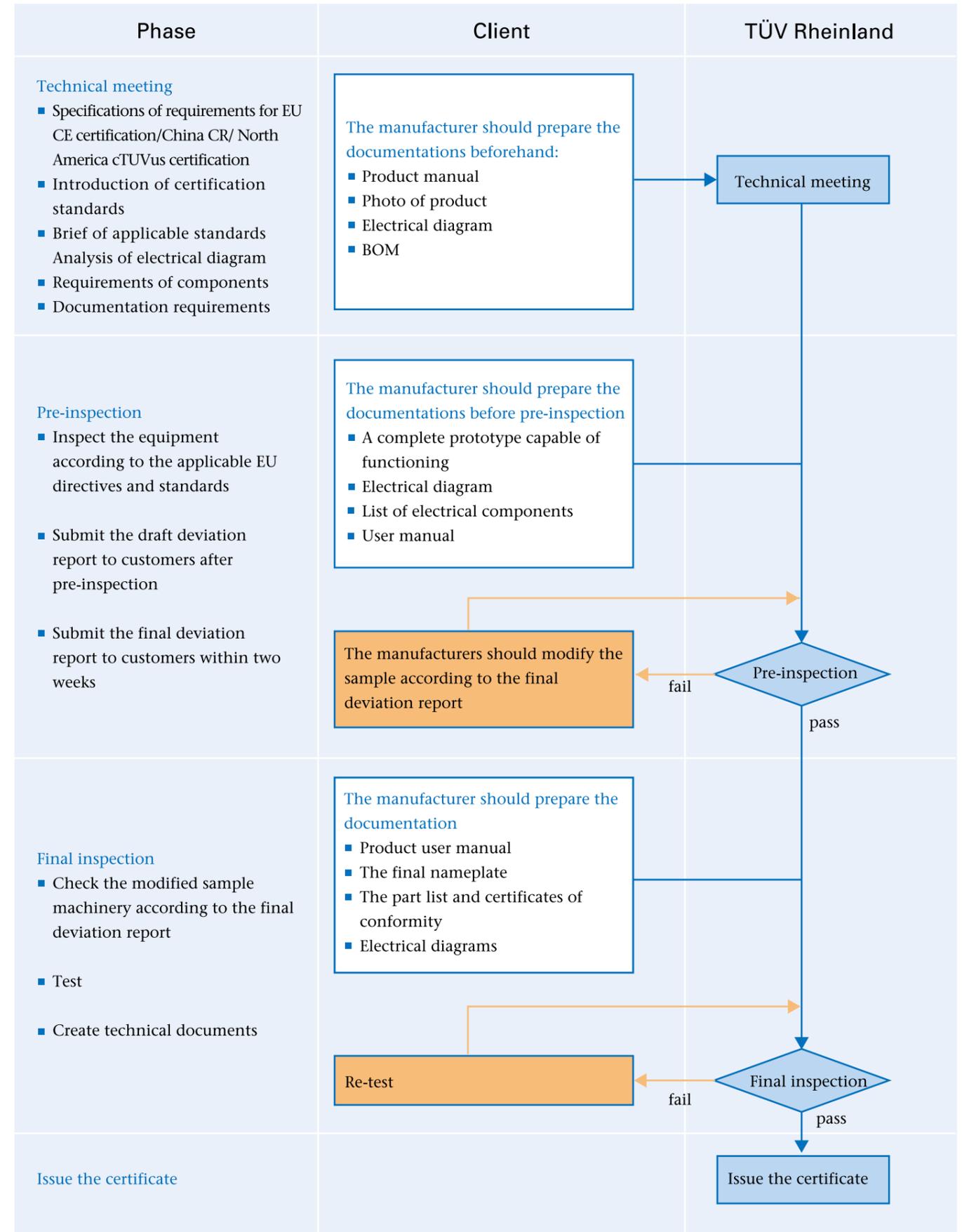
基本培訓、內部培訓、安全工程師個人資質培訓 Basic training, in-house training, safety engineer qualification program

培訓內容	Training Content
歐盟 CE 指令及法規	CE marking directives and requirement in European Union
電氣設備安全一般要求 (歐規要求) EN 60204	General requirements for safety electrical equipment (European market) EN 60204
機器人和系統安全標準介紹 ISO 10218	Introduction of safety standards of robot ISO 10218
EN ISO 13849-1 設計通則	General principle for design under EN ISO 13849-1
EN ISO 13849-2 確認	EN ISO 13849-2 validation
EN/IEC 62061 標準介紹	Standard introduction of EN/IEC 62061

機器人產品檢測驗證流程



Certification process for robots





TÜVRheinland®
Precisely Right.

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