

德國萊因TÜV，值得您信賴的的合作夥伴

TÜV Rheinland is your reliable partner

德國萊因TÜV在功能安全領域，一直是全球市場的領先者。

我們的功能安全團隊由不同背景的資深工程師和專家組成，能滿足各種各樣的功能安全需求，如模擬類比電路，即時嵌入式應用軟體，安全現場匯流排通訊，專用整合電路，可靠性和失效率計算(包括馬爾可夫模型)。

TÜV Rheinland is a world market leader in functional safety.

Our Functional Safety team consists of experienced scientists and engineers with diverse backgrounds to cover all your Functional Safety needs - analogue and digital hardware, real-time embedded and application software, safe field bus communications, application specific integrated circuits, reliability and failure rate calculations (including Markov modeling).

我們提供的功能安全驗證包括：

- 產品及系統
- 工程師
- 管理體系

We provide functional safety certification as below:

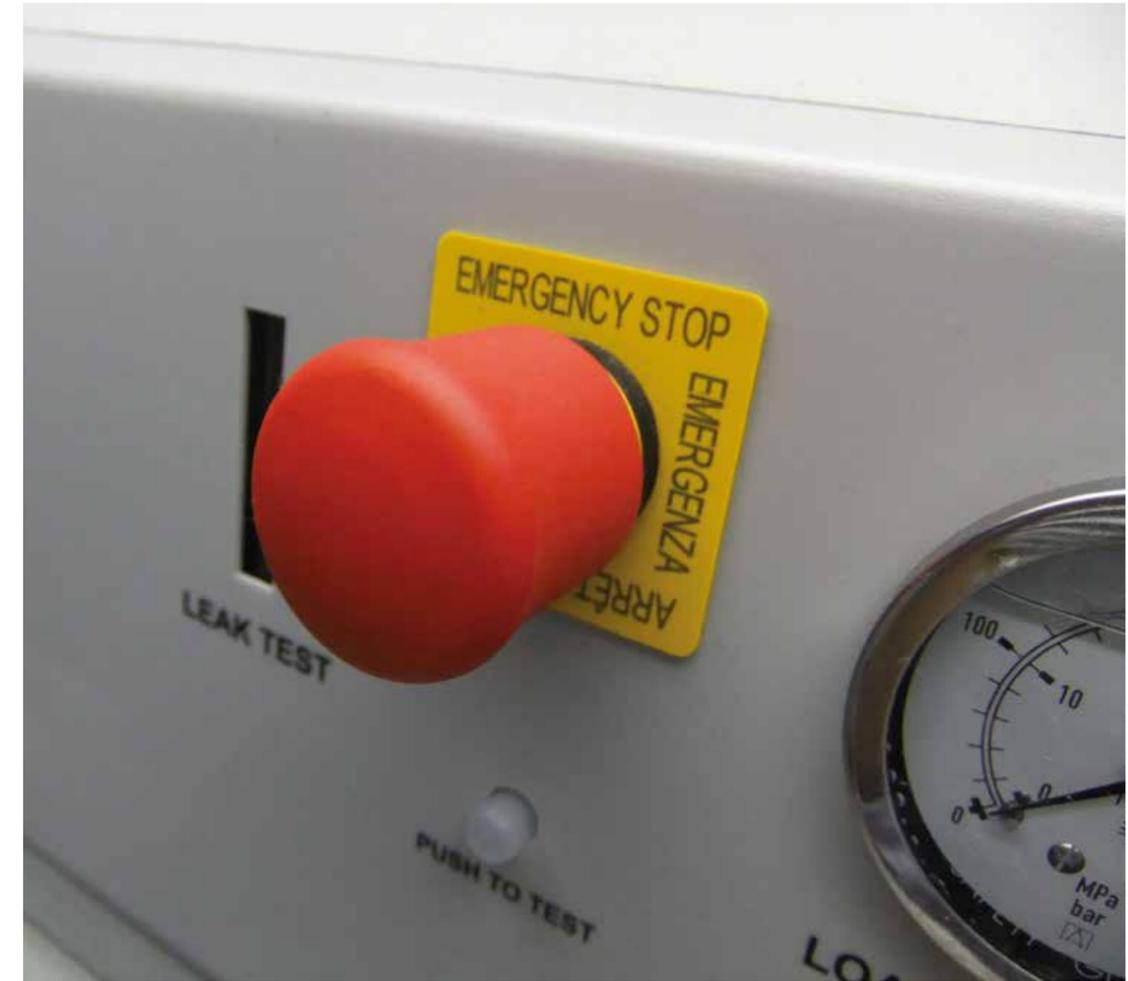
- Products and systems
- Engineers
- Management systems

培訓和研討會 Trainings and workshops

我們能協助您提升員工素質，提供培訓機會，協助您未來事業成功發展。

We can ensure your future success by facilitating the further education of your employees. We give you our support.

- 德國萊因TÜV功能安全培訓
 - 安全儀表系統 (IEC 61511, IEC 61508)
 - 軟/硬體系統設計 (IEC 61508)
 - 工業機械功能安全 (ISO 13849-1, IEC 61508和IEC 62061)
 - 汽車系統設計 (ISO 26262)
- TÜV Rheinland Functional Safety Programme
 - Safety instrumented systems (IEC 61511, IEC 61508)
 - Hardware/software design according to IEC 61508
 - Functional safety of machinery (ISO 13849-1, IEC 62061, IEC 61508)
 - Automotive system design according to ISO 26262
- 針對貴公司進行專門定制的特定功能安全主題培訓
- Workshops for specified target groups concentrated on functional safety topics



自動控制的功能安全驗證

Functional Safety Certification for Automation Control



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獲得SIL(安全完整性等級)驗證有助開拓國際市場

Having your products certified for SIL (Safety Integrity Level) opens doors to international markets

隨著越來越多複雜電氣、電子系統和可編程電子系統應用到安全控制系統中，任何一個失效，都會對員工、公眾、設備或者環境帶來嚴重後果。國際標準IEC 61508在2000年被提出，為保證系統的功能安全提供了基本框架。德國萊因TÜV的功能安全認證可從各零件到大型複雜系統，涵蓋的設備領域相當廣泛。

德國萊因TÜV是知名的認證機構，在功能安全領域有豐富的經驗，能夠為您提供專業的服務。我們主要專注於產品及系統的功能安全驗證，也可根據需求提供其他相關服務。

Complex electrical, electronic and programmable electronic systems are used increasingly in control systems where failure can lead to catastrophic consequences to employees, the general public or the environment. The international standard IEC 61508 was introduced in 2000 to provide a generic framework for ensuring the functional safety of such systems. We cover a wide scope of equipment, ranging from large complex systems to single components.

TÜV Rheinland is a recognised provider of expert services for functional safety with years of experience. Our main service is the functional safety certification of systems and products. Other related services are available on request.

功能安全服務內容舉例	Examples of functional safety service
<ul style="list-style-type: none">■ 功能安全管理審核■ 失效率計算(PFH/PFD)■ 失效模式及影響分析(FMEA)■ 安全完整性等級判定(SIL)■ 軟體評估, 環境測試(含EMC) <ul style="list-style-type: none">■ 故障插入測試■ 文件審核, 包括使用說明書和安全手冊	<ul style="list-style-type: none">■ Functional safety management audit■ Calculation of probability of failure (PFH/PFD)■ Failure mode and effects analysis (FMEA)■ Determination of safety integrity level (SIL)■ Software assessment and environmental tests (including EMC)■ Fault insertion testing■ Review of documentation including user documentation and safety manual

應用範圍

Range of application

功能安全驗證應用的產品，其安全性取決於感測器、邏輯伺服器系統正常的功能。這些系統包括電氣、電子系統和可編程電子系統。

Functional safety certification applies to automation equipment which has safety function with electrical/electronic/programmable electronic system of sensors, logic servers and final elements.

<ul style="list-style-type: none">■ 工業機械■ 核電廠儀表和控制系統■ 升降機、傳送裝置■ 石化行業測量、控制和監測設備■ 自動化生產線、機器人■ 電廠用鍋爐■ 升降機無線電控制■ 汽車	<ul style="list-style-type: none">■ Industrial machinery■ Nuclear power plant instrumentation and control systems■ Elevators, conveyors■ Petrochemical industry measuring, control and monitoring equipment■ Automated production lines, robots■ Furnaces for power plants■ Radio control for hoists■ Automotive
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EN/IEC 61508: 電氣/電子/可編程電子系統的功能安全

EN/IEC 61508: Functional safety of safety-related electrical/electronic/programmable electronic systems

機械Machinery	工業Industry	運輸Transportation	醫療Medical			
EN/IEC 62061: 機械安全 Safety of machinery 電子電氣相關安全及項目電子控制系統的功能安全 Functional safety of safety-related electrical, electronic and programmable electronic control systems	EN ISO 13849: 機械安全 Safety of machinery 控制系統相關安全 Safety-related parts of control systems	IEC 61513: 核電廠 Nuclear Power Plants 重要系統的儀器裝備及控制安全 Instrumentation and control for systems important to safety	EN/IEC 61511: 功能安全 Functional safety 製程工業中的安全儀器裝備系統 Safety instrumented systems for the process industry sector	ISO/CD 26262: 道路車輛 Road vehicles 功能安全 Functional safety	EN 50128: 鐵路應用 Railway applications 通訊、信號及流程系統：鐵路控制和保護系統軟體 Communications, signaling and processing systems. Software for railway control and protection systems	IEC 60601: 醫療儀器 Medical Electrical Equipment

型式認可流程

Type approval process

德國萊因TÜV的功能安全型式驗證提供全面的品質保證，確保產品設計充分符合國際標準要求，如 IEC 61508，ISO 13849，並且符合安全完整性等級或性能等級要求。

在初期概念審核階段，會對產品的主要性能和設備要求進行評估，儘早發現概念階段的不符項目，減少可能產生的整改費用。在主檢階段，對產品進行更詳細的理論和實踐評估。另外，還會對驗證、確認、管理和文件方面進行評估。

TÜV Rheinland functional safety type approval is comprehensive quality assurance to ensure that your products are adequately designed according to the requirements of international standards such as IEC 61508 or ISO 13849, and meet the requirements for the intended safety integrity level (SIL) or performance level (PL).

During the initial concept review, the principal performance and requirements 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 product. In addition, verification, validation, management and documentation aspects are evaluated.

產品和系統的功能安全驗證流程

Functional safety certification process for products and systems

