

Country 国家	Greater China 大中华区
Safety Mark: 安全标志:	TÜV Rheinland China Mark TÜV 莱茵中国标志
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1 Purpose 目的

This document describes the procedure for preparation, submittal, evaluation, and certification of products as defined in the scope for China Mark Approval of TÜV Rheinland (China) Ltd..

本文件阐述了莱茵检测认证服务(中国)有限公司 (TRCHN) 中国标志认证产品范围内规定的准备、提交、评估和认证程序。

2 Scope 范围

This document apply for the safety performance certification of tower for wind energy systems, this module is used for long periods of time in general outdoor weather conditions.

本规则适用于风电塔筒的安全性能认证，该组件是在一般室外气候条件下长期使用的。

3 Acc. Standards 依据标准

3.1 The standards for the accredited tower for wind energy systems 对获认可范围内的风电塔筒产品适用标准如下：

- GB/T 18451.1 Wind turbine generator systems - Design requirements
- GB/T 18451.1 风力发电机组设计要求
- GB 50017 Standard for design of steel structures
- GB 50017 钢结构设计标准
- GB 50010 Code for design of concrete structures
- GB 50010 混凝土结构设计规范
- GB 50135 Standard for design of high-rising structures
- GB 50135 高耸结构设计标准
- T/CEC 5008 Code of prestressed precast concrete tower for wind turbine
- T/CEC 5008 风力发电机组预应力装配式混凝土塔筒技术规范
- NBT 10907 Code for Design of Concrete-Steel Hybrid Tower of Wind Turbine
- NBT 10907 风电机组混凝土-钢混合塔筒设计规范
- NBT 10908 Code for Construction of Concrete-Steel Hybrid Tower of Wind Turbine
- NBT 10908 风电机组混凝土-钢混合塔筒施工规范
- IEC 61400-1 Wind energy generation systems – Part 1: Design requirements
- IEC 61400-1 风能发电系统 – 第 1 部分：设计要求
- IEC 61400-6 Wind energy generation systems – Part 6: Tower and foundation design requirements
- IEC 61400-6 风能发电系统 – 第 6 部分:塔和基础设计要求
- Eurocode 2: Design of concrete structures
- Eurocode 2：混凝土结构设计
- Eurocode 3: Design of steel structures

- Eurocode 3 : 钢结构设计
- CEB-FIP Model code for concrete structures
- CEB-FIP 混凝土结构规范
- DNVGL-ST-0126 Support structures for wind turbines
- DNVGL-ST-0126 风力发电机组支撑结构

3.2 Keywords 关键词

Safety 安全合规

4 Type of Approval 认证模式

The certification mode for tower is: design evaluation + manufacturing evaluation + supervision after certification.
风电塔筒的认证模式为：设计评估+制造评估+获证后监督。

The type certification including but not limited 认证模式的基本环节包括：

- Application 认证的申请
- Design Basis evaluation 设计准则评估
- Design evaluation 设计评估
- Manufacturing evaluation 制造评估
- Certification result assessment and approval 认证结果评价和批准
- Follow-up surveillance 获证后监督

5 The application of Certification 认证申请

5.1 Unit partition of the certified products 认证产品单元划分

In principle, according to the product model apply the certification. The same manufacturer, the same model, but different factory, the products should be divided into different application unit, construction site inspection will be conducted on one tower. The same materials, the same design, the same production technology, the same construction technology of the tower can be as one application unit.

原则上按产品型号申请认证。同一制造商、同一型号但生产厂不同的产品应分为不同的申请单元，施工现场检查仅在一个塔筒上进行。塔筒的材料相同、设计相同、生产工艺、施工工艺相同可作为一个申请单元。

5.2 Application documents 申请材料

- application form 申请表
- business license 营业执照
- factory inspection report which approved by TÜV (if have) TÜV莱茵批准的塔筒产品的工厂检查报告（如果有）
- test report of TÜV Rheinland or any other TÜV Rheinland appointed ISO/IEC 17025 laboratory (if have) TÜV莱茵测试报告或任何其他TÜV莱茵指定的符合ISO/IEC 17025要求的实验室出具的型式试验报告（如果有）
- Tower Design Loads Calculation Report 塔筒设计载荷计算报告
- Tower Structure Design Drawings 塔筒结构设计图纸
- Constructional drawing 塔筒施工图纸
- Tower production & construction technical documents 塔筒生产制造技术文件
- Hydrology and geological survey report 水文和地勘报告
- User's manual in English or Chinese language 中文或英文用户手册
- Photo-documentation (if not in the test report) 照片文件（如果试验报告中未包括）

6 Design evaluation 设计评估

6.1 Design evaluation process 设计评估程序

6.1.1 Documents review 文件审核

Review the design drawings, calculation documents and other data, and check whether they meet the requirements of relevant standards and specifications.

对设计图纸、计算文件等资料进行合规性审查，检查是否满足相关标准和规范的要求。

6.1.2 Independent calculation 独立计算

Perform independent calculation according to the design drawings and other data provided by the client.

根据客户提供的设计图纸等资料进行独立复核计算。

6.1.3 Period of design evaluation 设计评估周期

Period of design evaluation is start from the receipt of application documents and the fee of certification was paid, normal is 2 months (if have any non-conformities, the reprepare the documents or resubmission should not be included in the period)

设计评估周期从收到申请材料和认证费用算起，通常为 2 个月（因提交的文件不满足要求，申请人重新准备文件和重新提交的时间不计算在内）。

6.1.4 Design evaluation result determination 设计评估结果判定

Products testing should compliance with the requirements of 3.1, if have any non-conformities, should allow the applicant provide the new design documents after the corrective action. The items of the reevaluation are decided by the non-conformities, the period of the corrective action is no longer than 6 months. If have any non-conformities in the reevaluation, should decide the products do not compliance with the certification requirements.

设计评估应符合 3.1 标准的要求，产品如有部分项目不符合标准的要求，允许申请人整改后重新提交设计资料进行评估。重新评估的项目视不合格情况决定，整改期限不超过 6 个月。如仍有任何 1 项不符合标准要求时，则判定该认证单元产品不符合认证要求。

6.1.5 Design evaluation report 设计评估报告

After the certification approval, provide one design evaluation to the applicant.

认证批准后，为申请人提供一份试验报告。

6.2 关键零部件/材料要求

To ensure the compliance of the certified products, when the specification, model of the critical component/materials were changed, the licenses holder should make the change request in time, and provide the written documents for confirmation, the certificate can be used after the approval.

为确保获证产品的一致性，材料的技术参数、规格型号发生变化时，持证人应及时提出变更申请，并提供书面材料确认，经批准后方可在获证产品中使用。

7 Manufacturing Evaluation 制造评估

7.1 General 概述

The purpose of manufacturing evaluation is to assess if a specific wind turbine type is manufactured in conformity with the documentation design verified during the design evaluation. This evaluation shall include the following elements:

制造评估的目的是评估特定型号的风力发电机组的制造是否符合设计评估期间验证的文件设计。该评估应包括以下要素：

- quality system evaluation 质量体系评估
- manufacturing inspection 制造检查

The manufacturing evaluation presupposes that the manufacturer of the wind turbine and the main components operates a quality system. It requires manufacturing of at least one representative specimen of the type under certification.

制造能力评估假定风力发电机组及关键零部件制造商已经运行了相应的质量体系，认证时要求至少制造一个相应的样本。

7.2 Quality system evaluation 质量体系评估

The requirement for evaluation of the quality system is satisfied if the quality system is certified to be in conformance with ISO 9001. This system certification shall be carried out by an accredited body that operates according to ISO/IEC 17021.

如果厂家的质量体系已被验证其符合 ISO 9001，则符合本节质量体系评估要求。质量体系的认证须由获得认可的机构（依据 ISO/IEC 17021）执行。

If the quality system is not certified, the certification body shall evaluate the system of the applicant. The following aspects shall be evaluated:

如果申请人的质量体系未获得认证，认证机构应对其进行评估。须评估以下方面：

- responsibilities 职责分工
- control of documents 文件控制
- sub-contracting 分包
- purchasing 采购
- process control 过程控制
- inspection and testing 检验和测试
- corrective measures 整改措施
- quality recordings 质量记录
- training 培训
- product identification and traceability 产品的标识和可追溯性

7.3 Inspection content 检查内容

The factory inspection include the inspection of the factory quality assurance and the products compliance
工厂检查的内容为工厂质量保证能力和产品一致性检查。

7.3.1 Inspection of the factory/construction site quality assurance 工厂质量保证能力检查

Conduct the inspection according to the <the factory quality assurance of TÜV China mark>.

按《TÜV 莱茵中国标志认证工厂质量保证能力要求》进行检查。

7.3.2 Inspection of the products compliance 产品一致性检查

In the factory inspection, should inspect the products compliance on the production site, the major is the following:
工厂检查时，应在生产现场检查申请认证产品的一致性，重点核查一下内容：

The identification of the product should compliance with the information of the design evaluation report;
认证产品的标识应与设计评估报告上所标明的信息一致；

The construction of the product should compliance with the design evaluation report;
认证产品的结构应与设计评估报告中的一致；

The critical component/materials of the product should compliance with the design evaluation report;
认证产品所用的关键零部件/材料应与设计评估报告中的一致；

During the factory inspection, it should assure the applied products on production, and the inspector witness the production process on-site.

工厂检查时，申请认证的产品应在生产状态中，对产品过程采取现场见证。

7.3.3 The inspection of the factory quality assurance and the products compliance should cover all application products and workplaces.

工厂质量保证能力检查和产品一致性检查应覆盖申请认证的所有产品和加工场所。

7.4 Period of manufacturing evaluation 制造评估时间

The man-day decided by the scale of the application factory, the man-day as the follow:

制造评估人日数依据申请认证产品的工厂生产规模来确定，具体人天数如下：

Scale of the manufacturing evaluation 生产规模	Less than 100 100 人以下	equal and more than 100 100 人以上
Man-day 人日数	1-2	2-4

7.5 The result of initial factory/construction site inspection 初始工厂检查结论

Inspection team (inspector) is responsible for the result of the inspection report. If the inspection result is no-pass, Inspection team (inspector) should report to technical supporting and TRCHN. If the non-conformity was found during the factory/construction site inspection, the factory should conduct the corrective action within the time limit,

TRCHN verify the result of the corrective action in suitable method. If the factory doesn't conduct the corrective action within the time limit or verify the result of the corrective action is no-pass, the factory inspection is classified as no-pass.

检查组（检查员）负责报告检查结论。工厂检查结论为不通过的，检查组（检查员）直接向项目助理和 TRCHN 报告。工厂检查存在不符合项时，工厂应在规定期限内完成整改，TRCHN 采取适当方式对整改结果进行验证。未能按期完成整改的或整改不通过的，按工厂检查不通过处理。

8 Evaluation and approval of the certification 认证结果评价与批准

8.1 Evaluation and approval of the certification 认证结果评价与批准

TRCHN organize the evaluation for the result of the design evaluation and the factory inspection. After evaluation, issue the certificate to the applicant, every application unit with one certificate.

TRCHN 组织对设计评估结论和工厂检查结论进行综合评价。评价合格后，向申请人颁发产品认证证书。每一个申请认证单元颁发一份认证证书。

The same products, accept the result of the design evaluation and factory/construction site inspection report for the other TÜV's voluntary product certification, should be approved by the certifier and indicate the reason. The factory/construction site inspection report must be within 12 months and cannot be used beyond the time limit. 同样产品，采信已经获得 TÜV 莱茵颁发的自愿性产品认证证书的设计评估报告和工厂检查报告结论。工厂/施工现场检查报告必须在 12 个月内，超期不能采用。

8.2 Lead-time 交付周期

After finishing the design evaluation and factory/construction site inspection, and compliance with the certification requirements, TRCHN will issue the type certificate within two weeks when all the documents are provided.

完成设计评估和工厂检查后，对符合认证要求的，将在提供所有文件之后 2 周颁发型式认证证书。

If only the design evaluation is completed without factory inspection, TRCHN will issue the design evaluation conformity statement within two weeks when all the documents are provided.

如果只完成了设计评估，不做工厂检查，对符合认证要求的，将在提供所有文件之后 2 周颁发设计评估符合性声明。

8.3 Termination the certification 认证终止

When the design evaluation is disqualification or the factory/construction site inspection is no-pass, TRCHN make the unqualified decision, and terminate the certification. If continue the certification after the termination, should start from the new application.

当设计评估或工厂检查不通过，TRCHN 做出不合格决定，终止认证。终止认证后，如要继续申请，按新申请进行。

9 Follow-up surveillance 获证后监督

After the certificate issued, for the same category and specifications of the products covered by the certificate, the certification body should supervise and verify that the factory quality assurance ability of the production enterprise continues to meet the certification requirements, ensuring the certified products continue to meet the standard requirements and maintain the consistency with the type test samples. The supervision period generally does not exceed 2.5 years. After obtaining the certificate, the application enterprise should submit an annual report every year. The annual report includes: operation management and production of the application enterprise, abnormal operation experience of the product, information of the produced products (quantity and consistency of the produced products), and faults known to the certificate holder. When the certification body apply annual factory supervision inspection to the enterprise after obtaining the certificate, the application enterprise may not provide an annual report.

颁发认证证书后，对于该证书覆盖的同一类别、规格的产品，认证机构应进行监督，以验证生产企业的工厂质量保证能力持续符合认证要求、确保获证产品持续符合标准要求并保持与型式试验样品的一致性。监督周期一般不超过 2.5 年。申请企业获得证书后每年应提交年度报告，年度报告内容包括：申请企业运营管理和生产情况、产品非正常运行经历、已生产产品的信息（生产产品数量及一致性）、证书持有人所知的故障。当认证机构对申请企业获得证书后每年进行工厂监督检查时，申请企业可不提供年度报告。

Supervision inspection in factory conducted by certification body appointing inspector in accordance with “factory quality assurance of TÜV China mark”. Inspection of purchasing and incoming, production process control and process, production testing and type testing, consistency of certified product, certificates and certification mark logo usage shall be checked during supervision inspection, the remaining provisions on the basis of spot check. During supervision inspection, the applicant enterprise shall produce according to the same process as certified products.

监督检查由认证机构指定检查员对生产厂按照《TÜV 莱茵中国标志认证工厂质量保证能力要求》进行监督检查，其中采购和进货检验、生产过程控制和过程检验、出厂试验和型式试验、认证产品的一致性、证书及认证标志的使用情况为必查条款，其余条款依据情况进行抽查。监督检查时，申请企业应有认证产品或相同工艺流程的产品生产。

9.1 Surveillance inspection 监督检查时间

9.1.1 Surveillance frequency 监督检查频次

In general, after finishing the initial factory/construction site inspection, follow-up surveillance should be arranged within 12 months, and the timespan of every follow-up surveillance is no more than 12 months. Basis on the production situation, TRCHN can adjust the time of follow-up surveillance. If one of the following occurs, TRCHN would increase the frequency:

一般情况下，初始工厂/施工现场检查结束后，12个月内应安排监督检查，每次监督检查间隔不超过12个月。依据产品生产的实际情况，TRCHN可以按年度调整监督检查时间。若发生下述情况之一可增加频次：

- A、The certified products have the serious quality problem or user make the serious complaint and it was found to be a product problem 获证产品出现严重质量问题或用户提出严重投诉并经查实为产品问题的；
- B、TRCHN has enough reason query the certified products are not compliance with the certification standards TRCHN 有足够理由对获证产品与认证依据标准的符合性提出质疑时；
- C、Has enough reason show the manufacturer or constructor change the organization chart, production condition, quality management system and other which can affect the products compliance 有足够信息表明制造商或建设主体由于变更组织机构、生产条件、质量管理体系等而可能影响产品符合性或一致性时；

9.1.2 The man-day of follow-up inspection 监督检查人天数

The man-day decided by the scale of the application factory/construction site, the man-day as the follow: 依据申请认证产品的工厂生产规模来确定，具体人天数如下：

Scale of the factory/construction site 生产规模	Less than 100 100人以下	equal and more than 100 100人以上
Man-day 人日数	1	2

9.2 Follow-up surveillance content 监督检查的内容

The content of the follow-up surveillance include the inspection of the factory/construction site quality assurance and the products compliance. Conduct the surveillance inspection according to the <the factory quality assurance of TÜV China mark>.

监督检查的内容为工厂/施工现场质量保证能力和产品一致性检查。依据《TÜV 莱茵中国标志认证工厂质量保证能力要求》对工厂/施工现场进行监督检查。

The rectification of non-conforming items in the previous factory / construction site inspection is the necessary content of each supervision and inspection.

前次工厂/施工现场检查不符合项的整改情况是每次监督检查的必查内容。

9.3 The result of follow-up inspection 监督检查结论

Inspection team (inspector) is responsible for the result of the inspection report. If the inspection result is no-pass, Inspection team (inspector) should report to technical supporting and TRCHN. If the non-conformity was found during the factory inspection, the factory should conduct the corrective action within the time limit, TRCHN verify the result of the corrective action in suitable method. If the factory/construction site doesn't conduct the corrective action within the time limit or verify the result of the corrective action is no-pass, the factory inspection is classified as no-pass.

检查组（检查员）负责报告检查结论。工厂检查结论为不通过的，检查组（检查员）直接向项目助理和 TRCHN 报告。工厂检查存在不符合项时，工厂/施工现场应在规定期限内完成整改，TRCHN 采取适当方式对整改结果进行验证。未能按期完成整改的或整改不通过的，按工厂检查不通过处理。

9.4 Result evaluation 结果评价

TRCHN organize the evaluation for the result of the follow-up surveillance. After evaluation, issue the certificate of the factory inspection to the applicant, and the certification certificate maintain valid. If the follow-up surveillance is no-pass, follow the rules of item 9.3.

TRCHN 组织对监督检查结论进行评价，评价合格的，颁发工厂检查通过证书，认证证书保持有效。当监督检查不通过时，按照 9.3 规定执行。

10 Maintain, Change, suspend, restore, cancel and withdraw the certification 认证证书保持，变更，暂停，恢复，注销和撤销

10.1 Maintain the certification 保持认证

10.1.1 Certificate cycle 证书的有效期

The certification cycle of China Mark certificate is five years, re-certification is necessary after certificate expires. 本方案覆盖产品的认证周期是五年，五年有效期满后，需进行再认证。

10.1.2 Certified products changing 认证产品的变更

10.1.2.1 Application for Changing 变更的申请

When the content in the certificate is changed, or when the design, mechanism parameters, façade or critical component/materials involved in the safety and/or performance of the products are changed, license holder should make a change request to TRCHN.

证书上的内容发生变化时，或产品中涉及安全和/或性能的设计、机构参数、外观、关键零部件/材料发生变更时，证书持有者应向 TRCHN 提出变更申请。

10.1.2.2 Evaluate and approve the changing 变更的评价和批准

According to the evaluation of the changed content and the provided materials, TRCHN decide to make the change or not. If need the design evaluation and/or factory/construction site inspection, make the change after passing the design evaluation and factory/construction site inspection. In principle, the change evaluation should be based on the certified product that has been conducted the initial design evaluation. The design evaluation and/or factory/construction site inspection follow the rules of TRCHN.

TRCHN 根据变更的内容和提供的资料进行评价，确定是否可以变更。如需安排设计评估和/或工厂/施工现场检查，则设计评估合格和/或工厂/施工现场检查通过后方能进行变更。原则上，应以最初进行设计评估的认证产品为变更评价的基础。设计评估和工厂/施工现场检查按照 TRCHN 的规定执行。

Conformance to the requirements, approve the change and issue the new certificate.

对符合要求的，批准变更，并换发新的认证证书。

10.2 Extending scope of certification 扩大认证范围

10.2.1 Extending process 扩大的流程

The license holder want to extend the certification scope that is the same certification unit with the certified products, should start from the certification application and explain the extending request. TRCHEN review the compliance between the extending scope with the certified products, verify the validity of the original certification results for the extending scope, conduct products testing and/or factory inspection for discrepancies and/or extending scope, conformance to the requirements, issue the new certificate according to the requirements of the license holder.

认证证书持有者需要增加与已获得认证的产品为同一认证单元的产品认证范围时，应从认证申请开始办理手续，并说明扩大要求。TRCHN 核查扩大范围产品与原认证产品的一致性，确认原认证结果对扩大范围产品的有效性，针对差异和/或扩大的范围做补充试验和/或工厂检查，对符合要求的，依据认证证书持有者的要求换发证书。

In principle, the extending evaluation should be based on the certified product that has been conducted the initial design evaluation.

原则上，应以最初进行设计认证的认证产品为扩展评价的基础。

10.3 Suspension, Cancellation, Withdrawn and Restoring of certification 认证暂停、注销、撤销和恢复

In any circumstance, finds that a certified product is not in conformity with the essential requirements set out in the China Mark Scheme and / or Testing and Certification Regulation, TRCHN's certifier will suspend, cancel or withdraw related certificates.

无论通过何种方式发现认证产品不符合中国标志认证方案和/或检测认证条例规定的基本要求，TRCHN 签证官将暂停、注销和撤销相应证书。

The corrective action has to be reported and completed by the certificate holder, prior to the permission by China Mark certifier to claim the certified status again and to use the certification mark. The certifier will restore the certificate in valid according to the certification process of China Mark scheme. When certificate was suspended more than 6 months, the certificate shall be cancelled or withdrawn, or the corrective action has not completed as a waiver application, the certificate shall be withdrawn. In case of cancellation and withdrawn, the original certificate is requested to be returned to TRCHN in timely manner.

在 TRCHN 签证官允许恢复认证状态和使用认证标志前，证书持有者必须报告并完成纠正行动。签证官依照中国标志认证流程规定，将证书恢复为有效状态。对于暂停超过 6 个月，将注销或撤销相应证书；未完成纠正的，视为自愿放弃，对相应证书予以撤销。如果注销和撤销，需要及时将原证书退回给 TRCHN。

In case of suspension, cancellation or withdrawn, the license holder shall be informed accordingly by written stating the reasons for suspension, cancellation and withdrawn, and remark the certificate in its register as invalid. The license holder stop to use the certification mark on the products manufactured since the date of suspension, cancellation or withdrawn and will not place certified products on the market during the stated period. Potentially defective certified products are subject to corrective action including recall where appropriate.

当证书暂停，注销和撤销时，相关证书持有者将得到书面通知，说明暂停，注销和撤销的原因，并在记录中标记该证书无效。自暂停，注销和撤销日期起，不得将认证标志用于所制造的产品上，且在所述期限内，不得继续销售认证产品。对可能存在缺陷的认证产品应立即采取纠正行为，包括召回（如果适用）。

11 Certification mark 认证标志

The China Mark is the exclusively used by TÜV Rheinland (China) Ltd. such as: TÜV莱茵中国标志由是莱茵检测认证服务（中国）有限公司获证客户独家所有。例如：



- A、Generic Certipedia ID can be assigned for each Chin mark license holder. 可以为每个中国标志认证证书持有人编制Certipedia唯一性号码。
- B、The China Mark can be displayed on the rating label, package or user manual. 中国标志可以显示在等级标签、包装或用户手册上。
- C、There are no specific dimensional requirement of the mark, it should be visible and identified the information of test mark by naked eye as long as the proportions are kept. 只要保持一定比例，没有具体的标志尺寸要求，标志可以由肉眼看见并识别试验标志信息。
- D、There is no color scheme requirement for mark as long as the outline and artwork of the test mark is kept. 只要保持试验标志的轮廓和原图，没有标志配色方案要求。

The mark shall be used as stipulated in Testing and Certification regulations as well as the attachment to this document TR China Mark Certification Scheme. 标志应与测试和认证规则以及本文件附件德国莱茵中国标志认证方案中规定的标志相同。

12 Cost 收费

The certification cost follow the relevant rules of TRCHN. 认证费用按TRCHN有关规定收取。

13 Reference参考文件

The implementation of scheme refers to the instruction for tower certification ;

本方案的执行参考风电塔筒认证的作业指导书WEWI_TOW_Work Instruction for Tower Certification_V01。