



浙江特检

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## 特种设备制造监督检验证书

Manufacture Supervision Inspection Certificate for Special Equipment

(气瓶)

(Gas Cylinders)

证书编号(Certificate Number): PZJ2023BA0313

|                                               |                 |                                         |                       |
|-----------------------------------------------|-----------------|-----------------------------------------|-----------------------|
| 制造单位<br>Manufacturer                          | 浙江蓝能氢能科技股份有限公司  |                                         |                       |
| 制造许可级别<br>Manufacture Licensing Level         | A2、C3、B1、B4     | 制造许可证编号<br>Manufacture License No.      | TS2233580-2027        |
| 产品名称<br>Product Name                          | 大容积钢质无缝气瓶       | 产品型号<br>Product specification           | TUBE1-559-1090-16.6 I |
| 产品批号<br>Batch No                              | 23718           | 产品数量<br>Quantity                        | 30 只                  |
| 产品标准<br>Standard                              | GB/T 33145-2016 |                                         |                       |
| 设计单位<br>design organization                   | 浙江蓝能氢能科技股份有限公司  | 产品图号<br>Drawing Number                  | TUBE1-559-V-16.6 I-02 |
| 设计日期<br>Date of design                        | 2021年08月        | 制造日期<br>Date of Manufacturing           | 2023年09月              |
| 产品编号<br>Serial No.                            | 001-030         | 监督检验所抽的产品编号<br>Sample Gas Cylinders No. | 014                   |
| 不包括下列编号:<br>Un-including the numbers as below | -               |                                         |                       |

按照《特种设备安全监察条例》的规定,该批气瓶产品经我机构实施制造监督检验,安全性能符合《气瓶安全技术规程》(TSG 23-2021)的要求,特发此证书,并且在该批气瓶产品瓶肩标注有如下监督检验标志。

According to 《Regulations on Safety Supervision of Special Equipment》, this batch of products has been supervised and inspected and its safety performance conforms to 《Supervision Regulation on Safety technology for Gas Cylinders》(TSG 23-2021), the certificate is issued and TS stamp is marked on the shoulder of the products.

监督检验人员(Inspector):

陈心解

日期(DATE): 2023-10-16

TS

审核(Reviewer):

沈志刚

日期(DATE): 2023-10-16

批准(Approver):

陈心解

日期(DATE): 2023-10-17

监督检验机构: 浙江省特种设备科学研究院

Supervisory Inspection Institute: Zhejiang Academy of Special Equipment Science

(检验检测专用章)

(Inspection and Testing Stamp)

监督检验机构核准证编号: TS7110448-2025

Approved Certificate No. TS7110448-2025

注:本证书一式三份,一份监督检验机构存档,两份送制造单位,其中一份由制造单位随产品出厂资料交付。

Note: This certificate in triplicate, one save in Supervisory Inspection Institute, one save in manufacturer, and one send to user with Ex-factory Documents.

地址Address: 杭州市凯旋路211号 Kaixuan Rd 211#, Hangzhou 邮 编Post Cod: 310020

业务电话Business Tel.: 0571-86025622, 85114617

投诉电话Complaint Tel.: 0571-86024818、86026725

|                                                                                   |                                                |                |                     |
|-----------------------------------------------------------------------------------|------------------------------------------------|----------------|---------------------|
|  | 浙江蓝能氢能科技股份有限公司<br>Zhejiang Rein Hytec Co.,Ltd. | 版本状态/Rev       | A/03                |
|                                                                                   |                                                | 记录编号/Sheet No. | REIN/MR-WD068-QD021 |

钢质无缝气瓶批量检验质量证明书

Lot Inspection Quality Certificate of Seamless Steel Cylinders

证书编号 Certificate No.: LNZB718-2023

|                      |                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                |                      |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 产品名称<br>Product Name | 大容积钢质无缝气瓶<br>Large Capacity Seamless Steel Gas Cylinders                                                                                                 | 生产批号<br>Batch No.                                                                                                                                                                                                                                                                                              | 23718                |
| 产品编号<br>Eng.No.      | 001~030                                                                                                                                                  | 产品图号<br>Product drawing No.                                                                                                                                                                                                                                                                                    | TUBE1-559-V-16.6I-02 |
| 充装介质<br>(以整车介质为准)    | Design or Type of Gas<br>(The vehicle medium shall prevail)                                                                                              | SF <sub>6</sub> 、SiH <sub>4</sub> 、NF <sub>3</sub> 、N <sub>2</sub> O、HC1、CF <sub>4</sub> 、Xe、C <sub>2</sub> H <sub>6</sub> 、C <sub>2</sub> H <sub>4</sub> 、CHF <sub>3</sub> 、C <sub>2</sub> H <sub>6</sub> 、C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> 、C <sub>2</sub> H <sub>3</sub> F、PH <sub>3</sub> M-TF |                      |
| 制造厂<br>Manufacturer  | 浙江蓝能氢能科技股份有限公司<br>Zhejiang Rein Hytec Co.,Ltd.                                                                                                           | 生产许可证编号<br>Production license number                                                                                                                                                                                                                                                                           | TS2233580-2027       |
| 地址<br>Address        | 浙江省杭州湾上虞经济技术开发区东一区振兴大道 5 号<br>No 5 Zhenxing Road , Eastern Area I, Shangyu Economic and Technological Development Zone ,Hangzhou Bay, Zhejiang Province. |                                                                                                                                                                                                                                                                                                                |                      |

1.技术数据 Technical Data

|                                            |                |                                       |                                                                   |
|--------------------------------------------|----------------|---------------------------------------|-------------------------------------------------------------------|
| 工作压力 MPa<br>SERVICE Pressure               | 16.6           | 水压试验压力 MPa<br>Hydraulic Test Pressure | 27.7                                                              |
| 工作环境温度℃<br>Working Environment Temperature | -40~60         | 气密性试验压力 MPa<br>Leak Test Pressure     | 随整车进行气密性试验<br>Carry out air tightness test with the whole vehicle |
| 气瓶规格<br>Specification                      | Φ559×13.7×5400 | 气瓶型号<br>Cylinder Model                | TUBE1-559-1090-16.6I                                              |

2.主体材料化学成分复验值 Chemical Analysis of Main Material

|                       |           |           |                |           |        |                   |           |           |
|-----------------------|-----------|-----------|----------------|-----------|--------|-------------------|-----------|-----------|
| 材料牌号<br>Material      | 4130X     |           | 炉号<br>Heat No. | S12306043 |        | 入库编号<br>Stock No. | G23335    |           |
| 项目<br>Item            | C<br>%    | Si<br>%   | Mn<br>%        | P<br>%    | S<br>% | P+S<br>%          | Cr<br>%   | Mo<br>%   |
| 标准值<br>Standard Value | 0.25~0.35 | 0.15~0.35 | 0.40~0.90      | ≤0.015    | ≤0.008 | ≤0.025            | 0.80~1.10 | 0.15~0.25 |
| 供应值<br>Supplied value | 0.32      | 0.27      | 0.82           | 0.010     | 0.002  | 0.012             | 1.01      | 0.22      |
| 复验值<br>Retest value   | 0.31      | 0.28      | 0.81           | 0.011     | 0.003  | 0.014             | 1.00      | 0.21      |

3.热处理 Heat Treatment

|                                |                               |                          |                                      |
|--------------------------------|-------------------------------|--------------------------|--------------------------------------|
| 热处理方法<br>Heat Treatment Method | 调质<br>Hardening and Tempering | 淬火介质<br>Quenching Medium | 水基淬火剂<br>Water-based Hardening Agent |
|--------------------------------|-------------------------------|--------------------------|--------------------------------------|

|                                                                                   |                                                |                |                     |
|-----------------------------------------------------------------------------------|------------------------------------------------|----------------|---------------------|
|  | 浙江蓝能氢能科技股份有限公司<br>Zhejiang Rein Hytec Co.,Ltd. | 版本状态/Rev       | A/03                |
|                                                                                   |                                                | 记录编号/Sheet No. | REIN/MR-WD068-QD021 |

# 钢质无缝气瓶批量检验质量证明书

## Lot Inspection Quality Certificate of Seamless Steel Cylinders

证书编号 Certificate No.: LNJB718-2023

### 4.调质处理后机械性能试验值 Mechanical Properties After Heat Treatment

| 项目<br>Item            | 抗拉强度<br>T.S<br>Rm<br>MPa | 屈服强度<br>Y.S<br>ReL<br>MPa | 屈强比<br>ReL<br>/Rm | 伸长率<br>Elongatio<br>n<br>A <sub>50</sub><br>% | 冲击试验 Impact Tset<br>(-40℃)J |                      | 压扁试验<br>Flattening<br>Test | 硬度<br>Hardnes<br>HBW |
|-----------------------|--------------------------|---------------------------|-------------------|-----------------------------------------------|-----------------------------|----------------------|----------------------------|----------------------|
|                       |                          |                           |                   |                                               | 平均值<br>Avg.Value            | 单个试验最小值<br>Min.Value |                            |                      |
| 标准值<br>Standard Value | 725~880                  | 485-750                   | ≤0.86             | ≥20                                           | ≥60                         | ≥48                  | 无裂纹<br>No crack            | 195~269              |
| 试验值<br>Test value     | 780                      | 647                       | 0.83              | 28.0                                          | 105                         | 102                  | 无裂纹<br>No crack            | 合格 OK                |

### 5.金相检查 Micrographic Examination

| 编号<br>Id              | 组织<br>Structure           | 晶粒度（级）<br>Grain Size (Grade) | 脱碳层深度 Decarburized Depth (mm) |               |
|-----------------------|---------------------------|------------------------------|-------------------------------|---------------|
|                       |                           |                              | 内壁<br>Inside                  | 外壁<br>Outside |
| 标准值<br>Standard value | 回火索氏体<br>Tempered Sorbite | ≥7.0                         | ≤0.25mm                       | ≤0.30mm       |
| 检验值<br>Test value     | 回火索氏体<br>Tempered Sorbite | 8.0                          | 0.11                          | 0.20          |

经检验，符合 GB/T 33145-2016《大容积钢质无缝气瓶》及设计图样的要求，该批气瓶合格。  
Through inspection, this batch of cylinders is qualified to conform to the requirements of standard GB/T 33145-2016 “Large capacity seamless steel Gas cylinders” and drawing design.

监督检查员:  
Inspector

监检项目 A / B / C  
监检: 孙志军  
日期: 2023年10月13日

监检单位专用章  
Special Seal For Inspection Agency  
日期 Date:

黄国明  
质量保证工程师  
QA Engineer  
质量检验专用章

制造厂检验专用章  
Special Seal For Quality Examination  
日期 Date: