



中普(邯郸)钢铁有限公司  
ZHONGPU (HANDAN) IRON AND STEEL CO.,LTD

产品质量证明书  
CERTIFICATE OF PRODUCT QUALITY

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                      |                      |             |              |              |                     |                                    |                                   |                |                     |                                                       |                 |       |       |                          |       |                            |                |                |                                                                                       |      |                               |                                                                                     |   |      |           |
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| 收货单位<br>PURCHASER     | 北京普阳国际能源管理股份有限公司                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                      |             |              |              |                     | 订单编号<br>CONTRACT NO.               |                                   |                |                     | BJ134EPP240726<br>S02408040234                        |                 |       |       | 车 号<br>VEHICLE NO.       |       |                            |                | 冀EV4552        |                                                                                       |      |                               |  |   |      |           |
| 产品名称<br>PRODUCT       | 高强度低合金铌-钒结构钢<br>HIGH STRENGTH LOW ALLOY Nb-V STRUCTURAL STEEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                      |                      |             |              |              |                     | 交货状态<br>CONDITION OF DELIVERY      |                                   |                |                     | AR                                                    |                 |       |       | 证明书号<br>CERTIFICATE NO.  |       |                            |                | GC202410229180 |                                                                                       |      |                               |                                                                                     |   |      |           |
| 执行标准<br>SPECIFICATION | ASTM A572/A572M-21                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                      |             |              |              |                     | 发货日期<br>DATE OF DELIVERY           |                                   |                |                     | 2024-10-22                                            |                 |       |       | 认证号<br>AUTHORIZATION NO. |       |                            |                |                |                                                                                       |      |                               |                                                                                     |   |      |           |
| 炉 号<br>HEAT NO.       | 批 号<br>BATCH NO.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 牌 号<br>GRADE                         | 尺 寸<br>SIZE (mm)     |             |              | 张数<br>PIECES | 重量<br>WEIGHT<br>(t) | 拉伸试验<br>TENSILE TEST               |                                   |                |                     | 冲击吸收能量 J (KV <sub>2</sub> )<br>IMPACT ABSORBED ENERGY |                 |       |       |                          |       | 弯曲<br>BEND<br>TEST<br>180° | 硬度<br>HARDNESS |                |                                                                                       |      | Z向断面收缩率%<br>SECTION SHRINKAGE |                                                                                     |   |      | 探伤<br>U T |
|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                      | 厚度<br>THICK-<br>NESS | 宽度<br>WIDTH | 长度<br>LENGTH |              |                     | 屈服<br>强度<br>R <sub>eL</sub><br>MPa | 抗拉<br>强度<br>R <sub>m</sub><br>MPa | 屈强<br>比<br>YSR | 断后<br>伸长<br>率A<br>% | 方向<br>DIREC-<br>TION                                  | 温度<br>TEMP<br>℃ | 1     | 2     | 3                        | AVE.  |                            | 1              | 2              | 3                                                                                     | AVE. | 1                             | 2                                                                                   | 3 | AVE. |           |
| 1422109118Y           | 24E069470                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ASTM<br>A572<br>GR50                 | 16                   | 2440        | 12000        | 4            | 14.712              | 393                                | 528                               | 0.74           | 21.5                | L                                                     | 20              | 158   | 162   | 162                      | 161   | OK                         |                |                |                                                                                       |      |                               |                                                                                     |   |      |           |
| 3412105289E           | 24E064402                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ASTM<br>A572<br>GR50                 | 10                   | 2440        | 12000        | 3            | 6.894               | 373                                | 531                               | 0.70           | 24.0                | L                                                     | 20              | 121   | 122   | 127                      | 123   | OK                         |                |                |                                                                                       |      |                               |                                                                                     |   |      |           |
| 总计 (TOTAL)            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                      |                      |             |              | 7            | 21.606              |                                    |                                   |                |                     |                                                       |                 |       |       |                          |       |                            |                |                |                                                                                       |      |                               |                                                                                     |   |      |           |
| 批 号<br>BATCH NO.      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 化学成分 CHEMICAL COMPOSITION (质量分数) / % |                      |             |              |              |                     |                                    |                                   |                |                     |                                                       |                 |       |       |                          |       |                            |                |                | 其它<br>OTHER                                                                           |      |                               |                                                                                     |   |      |           |
|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | C                                    | Si                   | Mn          | P            | S            | Alt                 | Als                                | Nb                                | V              | Ti                  | Cr                                                    | Ni              | Cu    | Mo    | B                        | N     |                            | CEV            | Pcm            |                                                                                       |      |                               |                                                                                     |   |      |           |
| 24E069470             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.17                                 | 0.18                 | 1.08        | 0.015        | 0.007        |                     | 0.010                              | 0.0105                            | 0.003          | 0.012               | 0.018                                                 | 0.007           | 0.009 | 0.002 | 0.0002                   | 0.002 |                            | 0.36           | 0.23           |                                                                                       |      |                               |                                                                                     |   |      |           |
| 24E064402             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.17                                 | 0.24                 | 1.16        | 0.020        | 0.003        |                     | 0.020                              | 0.0111                            | 0.002          | 0.017               | 0.013                                                 | 0.007           | 0.010 | 0.004 | 0.0003                   | 0.006 |                            | 0.37           | 0.24           |                                                                                       |      |                               |                                                                                     |   |      |           |
| 注释<br>NOTES           | 1. 位置方向 T=横向 TRANSVERSE L=纵向 LONGITUDINAL<br>2. 交货状态 N=正火 Q=淬火 CR=控轧 TMCP=热机械轧制 AR=热轧 NR=正火轧制 T=回火                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                      |             |              |              |                     |                                    |                                   |                |                     |                                                       |                 |       |       |                          |       |                            |                |                |                                                                                       |      |                               |                                                                                     |   |      |           |
| 说明<br>REMARKS         | 1. 本产品的表面质量和外形尺寸均合格。<br>Surface quality and shape size of product are all qualified.<br>2. 兹证明本产品按照标示产品执行标准和订货协议要求制造、检测并判定, 氮含量提供产品执行标准规定限制值内保证。<br>It is hereby certified that the product is manufactured, tested and judged in accordance with the implementation standards of the labeled product and the order agreements. The nitrogen content is guaranteed within the limits specified in the product implementation standards.<br>3. 本产品质量证明书无产品质量专用章无效。<br>The certificate of product quality is invalid without quality stamp.<br>4. 如发现质量问题请与我公司联系。<br>Please contact us if any quality problem occurred. |                                      |                      |             |              |              |                     |                                    |                                   |                |                     |                                                       |                 |       |       |                          |       | 签发:<br>ISSUED<br>申利晶       |                |                |  |      |                               |                                                                                     |   |      |           |

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开证日期: 2024-10-22  
ISSUE DATE.