|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **焊接螺旋盘管强度校核** | | | 计算单位 |  | | | |
| 计算所依据的标准 | | | | **HG/T 20569-2013** | | | |
| **计 算 条 件** | | | | **盘 管 简 图** | | | |
| 设计温度, t | | °C | **$$001** | $01  $02  $03  $04  $05  a  b  b | | | |
| 压力试验类型 | | **气压试验** | |
| 容器 | 材料标准号 | **$$003** | |
| 材料牌号/名称 | **$$004** | |
| 设计压力, Psd | MPa | **$$005** |
| 静压力, Pss | MPa | **$$006** |
| 内直径, Dsi | mm | **$$007** |
| 名义厚度, δsn | mm | **$$008** |
| 焊接接头系数, Φs | / | **$$009** |
| 腐蚀裕量, Cs2 | mm | **$$010** |
| 壁温, tsb | ℃ | **$$011** |
| 盘 管 | 材料标准号 | **$$012** | |
| 材料牌号/名称 | **$$013** | |
| 设计压力, Pjd | MPa | **$$014** |
| 静压力, Pjs | MPa | **$$015** |
| 外直径, do | mm | **$$016** |
| 螺旋节距, ts | mm | **$$017** |
| 名义厚度, δjn | mm | **$$018** |
| 焊接接头系数, Φj | / | **$$019** |
| 腐蚀裕量, Cj2 | mm | **$$020** |
| 壁温, tjb | ℃ | **$$021** |
| **材 料 特 性** | | | | | | | |
| 筒体材料 | 密度, ρs | kg/m³ | **$$022** | 盘管材料 | 密度, ρj | kg/m³ | **$$023** |
| 设计温度许用应力, [σ]st | MPa | **$$024** | 设计温度许用应力, [σ]jt | MPa | **$$025** |
| 试验温度许用应力, [σ]s | MPa | **$$026** | 试验温度许用应力, [σ]j | MPa | **$$027** |
| 抗拉和屈服  强度控制的应力, [σ]st1 | MPa | **$$028** | 抗拉和屈服  强度控制的应力, [σ]jt1 | MPa | **$$029** |
| 试验温度屈服点, RseL | MPa | **$$030** | 试验温度下屈服点, RjeL | MPa | **$$031** |
| 壁温弹性模量, Est | 103MPa | **$$032** | 壁温弹性模量, Ejt | 103MPa | **$$033** |
| 常温-壁温  平均线膨胀系数, αs | 10-6/°C | **$$034** | 常温-壁温  平均线膨胀系数, αj | 10-6/°C | **$$035** |
| 泊松比, μs | / | **$$036** | 泊松比, μj | / | **$$037** |
| 负偏差, Cs1 | mm | **$$038** | 负偏差, Cj1 | mm | **$$039** |
| **过 程 参 数 计 算** | | | | | | | |
| 筒体厚度附加量, Cs | | mm | Cs = Cs1 + Cs2 | | | | **$$040** |
| 筒体有效厚度, δse | | mm | δse = δsn - Cs | | | | **$$041** |
| 筒体计算压力, Psc | | MPa | Psc = Psd + Pss | | | | **$$042** |
| 筒体平均半径, Rm | | mm | Rm = (Dsi +δse)/2 | | | | **$$043** |
| 盘管厚度附加量, Cj | | mm | Cj = Cj1 + Cj2 | | | | **$$044** |
| 盘管有效厚度, δje | | mm | δje = δjn – Cj | | | | **$$045** |
| 盘管计算压力, Pjc | | MPa | Pjc = Pjd + Pjs | | | | **$$046** |
| 盘管内直径, di | | mm | di = do - 2δjn | | | | **$$047** |
| 制造环境温度, t0 | | ℃ | t0 = 20 | | | | **20** |
| **筒 体 应 力 校 核** | | | | | | | |
| 系数, D | | / |  | | | | **$$049** |
| 系数, k | | / |  | | | | **$$050** |
| 系数, a | | / |  | | | | **$$051** |
| 系数, A | | / |  | | | | **$$052** |
| 系数, u | | / | u = ats/2 | | | | **$$053** |
| 系数, μ1(u) | | / | 查表 B.4.2 | | | | **$$054** |
| 系数, B1 | | / |  | | | | **$$055** |
| 系数, q0 | | / |  | | | | **$$056** |
| 系数, X1(u) | | / | 查表 B.4.2 | | | | **$$057** |
| 系数, X2(u) | | / | 查表 B.4.2 | | | | **$$058** |
| 系数, φ1(u) | | / | 查表 B.4.2 | | | | **$$059** |
| 筒体许用应力, Φs[σ]st | | MPa | Φs[σ]st | | | | **$$060** |
| a点 | 内壁轴向力, σ1ai | MPa |  | | | | **$$061** |
| 外壁轴向力, σ1ao | MPa |  | | | | **$$062** |
| 轴向力校核 | / | max{|σ1ai|, |σ1ao|} ≤ Φs[σ]st | | | | **$$063** |
| 内壁环向力, σ2ai | MPa |  | | | | **$$064** |
| 外壁环向力, σ2ao | MPa |  | | | | **$$065** |
| 环向力校核 | / | max{|σ2ai|, |σ2ao|} ≤ Φs[σ]st | | | | **$$066** |
| b点 | 内壁轴向力, σ1bi | MPa |  | | | | **$$067** |
| 外壁轴向力, σ1bo | MPa |  | | | | **$$068** |
| 轴向力校核 | / | max{|σ1bi|, |σ1bo|} ≤ Φs[σ]st | | | | **$$069** |
| 内壁环向力, σ2bi | MPa |  | | | | **$$070** |
| 外壁环向力, σ2bo | MPa |  | | | | **$$071** |
| 环向力校核 | / | max{|σ2bi|, |σ2bo|} ≤ Φs[σ]st | | | | **$$072** |
| **盘 管 应 力 校 核** | | | | | | | |
| 盘管许用应力, Φj[σ]jt | | MPa | Φj[σ]jt | | | | **$$073** |
| 管壁轴向力, σ1 | | MPa |  | | | | **$$074** |
| 管壁轴向力校核 | | / | σ1 ≤ Φj[σ]jt | | | | **$$075** |
| 管壁环向力, σ2 | | MPa |  | | | | **$$076** |
| 管壁环向力校核 | | / | σ2 ≤ Φj[σ]jt | | | | **$$077** |
| **压 力 试 验** | | | | | | | |
| 筒体试验压力, PST | | MPa | PST = 1.10×Psd×[σ]s/max{[σ]st , [σ]st1} | | | | **$$078** |
| 盘管试验压力, PJT | | MPa | PJT = 1.10×Pjd×[σ]j/max{[σ]jt , [σ]jt1} | | | | **$$079** |