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| --- | --- | --- | --- | --- | --- | --- | --- |
| **工字钢腿式支座设计计算** | | | 计算单位 |  | | | |
| 计算所依据的标准 | | | | **JB/T 4712.2-2007** | | | |
| **计 算 条 件** | | | | **支 腿 简 图** | | | |
| 支座设计温度, t | | ℃ | **$$001** | $02  $03  $13  $14  $14  $24  $27  C.G.  $28  50  $04  壳体  工字钢 | | | |
| 容 器 | 壳体总高度(含保温层), H0 | mm | **$$002** |
| 壳体外直径(含保温层), D0 | mm | **$$003** |
| 筒体外直径(不含保温层), Ds0 | mm | **$$004** |
| 最大操作重量, m0 | kg | **$$005** |
| 地震/风 | 10m高度基本风压值, q0 | N/m2 | **$$006** |
| 风压高度变化系数, fi | / | **$$007** |
| 设计基本地震加速度 | / | **$$008** |
| 支 腿 | 材料标准号 | **$$009** | |
| 材料名称/牌号 | **$$010** | |
| 支腿数量, N | / | **$$011** |
| 工字钢规格 | **$$012** | |
| 到基础板边缘最大距离, B | mm | **$$013** |
| 与本体装配焊缝长度, hf | mm | **$$014** |
| 装配焊缝焊脚高度, tf1 | mm | **$$015** |
| 地脚螺栓 | 材料标准号 | **$$016** | |
| 材料名称/牌号 | **$$017** | |
| 规格 | / | **$$018** |
| 单个支腿螺栓个数, nbt | / | **$$019** |
| 腐蚀裕量, Cb2 | mm | **$$020** |
| 底 板 | 材料标准号 | **$$021** | |
| 材料名称/牌号 | **$$022** | |
| 腐蚀裕量, Cd2 | mm | **$$023** |
| 厚度, δdn | mm | **$$024** |
| 底板长度, d1 | mm | **$$025** |
| 底板宽度, d2 | mm | **$$026** |
| 支承高度, H | mm | **$$027** |
| 下表面到设备质心高度, Hc | mm | **$$028** |
| 基础混凝土许用耐压应力, [σc1] | | MPa | **$$029** |
| **材 料 特 性** | | | | | | | |
| 支 腿 | 设计温度许用应力, [σ]st | MPa | **$$030** | 截面积, A | | mm2 | **$$035** |
| 设计温度屈服点, | MPa | **$$031** | 密度, ρs | | kg/m3 | **$$038** |
| 设计温度弹性模量, | 103MPa | **$$032** | 外表面积, Ao | | m2/m | **$$039** |
| 高度, h | mm | **$$033** | 截面周向惯性矩, Ix-x | | mm4 | **$$040** |
| 宽度, b | mm | **$$200** | 截面径向惯性矩, Iy-y | | mm4 | **$$041** |
| 腰板厚度, d | mm | **$$201** | 截面最小抗弯模量, Wmin | | mm3 | **$$042** |
| 翼板中部厚度, t | mm | **$$034** | 底 板 | 密度, ρd | kg/m³ | **$$044** |
| 螺栓 | 密度, ρb | kg/m³ | **$$036** | 材料负偏差, Cd1 | mm | **$$045** |
| 设计温度许用应力, [σ]bt | MPa | **$$037** | 设计温度许用应力, [σ]dt | MPa | **$$046** |
| **支 腿 载 荷 计 算** | | | | | | | |
| 水平风载荷, Pw | | N |  | | | | **$$047** |
| 地震影响系数, αe | | / | αe = {0.08,0.1g; 0.12,0.15g; 0.16,0.2g; 0.24,0.3g; 0.32,0.4g} | | | | **$$048** |
| 重力加速度, g | | m/s2 | g = 9.8 | | | | **9.8** |
| 水平地震力, Pe | | N |  | | | | **$$050** |
| 水平载荷, FH | | N |  | | | | **$$051** |
| 垂直载荷, W1 | | N | W1 = m0g | | | | **$$052** |
| 单个支腿水平反力, R | | N | R = FH/N | | | | **$$053** |
| 支腿中心圆直径, DB | | mm |  | | | | **$$055** |
| 拉伸侧单根支腿垂直反力,FL1 | | N |  | | | | **$$056** |
| 压缩侧单根支腿垂直反力,FL2 | | N |  | | | | **$$057** |
| **支 腿 稳 定 性、强 度 计 算 及 校 核** | | | | | | | |
| 支腿水平截面最小惯性矩, Imin | | mm4 |  | | | | **$$058** |
| 支腿最小回转半径, | | mm |  | | | | **$$059** |
| 支腿的有效细长比, λ | | / |  | | | | **$$060** |
| 支腿的极限细长比, | | / |  | | | | **$$061** |
| 系数, ns | | / |  | | | | **$$062** |
| 设备重要度系数, η | | / | η = 1.0 | | | | **1.0** |
| 临界许用压应力, | | MPa |  | | | | **$$064** |
| 单根支腿实际压应力, σc | | MPa |  | | | | **$$065** |
| 支腿压应力校核 | | / |  | | | | **$$066** |
| 实际剪应力, τ | | MPa |  | | | | **$$067** |
| 许用剪应力, [τ] | | MPa | [τ] = 0.6[σ]st | | | | **$$068** |
| 剪应力校核 | | / | τ ≤ [τ] | | | | **$$069** |
| 底板下表面  至支腿装配焊缝中心的长度, L1 | | mm | L1 = H + hf/2 + 50 | | | | **$$070** |
| 形心到壳体外壁距离, e | | mm |  | | | | **$$071** |
| 实际弯曲应力, σb | | MPa |  | | | | **$$072** |
| 许用弯曲应力, | | MPa | [σb] = 1.5[σ]st | | | | **$$073** |
| 弯曲应力校核 | | / | σb ≤ [σb] | | | | **$$074** |
| 支腿综合评价 | | / |  | | | | **$$075** |
| **地 脚 螺 栓 计 算 及 校 核** | | | | | | | |
| 螺纹小径, dmin | | mm | 查GB/T 196 | | | | **$$076** |
| 螺栓有效截面积, Abt | | mm2 |  | | | | **$$077** |
| 地脚螺栓拉应力, σbt | | MPa |  | | | | **$$078** |
| 地脚螺栓拉应力校核 | | / | σbt <= [σ]bt | | | | **$$079** |
| 地脚螺栓剪应力, τbt | | MPa |  | | | | **$$080** |
| 许用剪应力, [τ]bt | | MPa | [τ]bt = 0.6[σ]bt | | | | **$$081** |
| 地脚螺栓剪应力校核 | | / | τbt <= [τ]bt | | | | **$$082** |
| **基 础 应 力 计 算 及 校 核** | | | | | | | |
| 基础上的压缩应力, σc1 | | MPa |  | | | | **$$083** |
| 基础压缩应力校核 | | / | σc1 <= [σc1] | | | | **$$084** |
| **底 板 计 算 及 校 核** | | | | | | | |
| 底板计算厚度, δdc | | mm |  | | | | **$$085** |
| 底板设计厚度, δdd | | mm |  | | | | **$$086** |
| 底板厚度校核 | | / |  | | | | **$$087** |
| **支 腿 装 配 焊 缝 强 度 计 算 及 校 核** | | | | | | | |
| 角焊缝系数, Φ | | / | Φ = 0.49 | | | | **0.49** |
| 焊缝许用应力, [B] | | MPa | [B] = 1.5[σ]stΦ | | | | **$$089** |
| 焊缝计算长度, hf1 | | mm |  | | | | **$$090** |
| 焊缝抗弯截面模量, Z | | mm3 |  | | | | **$$091** |
| 焊缝弯曲应力, σf | | MPa |  | | | | **$$092** |
| 弯曲应力校核 | | / | σf <= [B] | | | | **$$093** |
| 焊缝横截面积, Af | | mm2 |  | | | | **$$094** |
| 焊缝剪应力, τf | | MPa |  | | | | **$$095** |
| 剪切应力校核 | | / | τf <= [B] | | | | **$$096** |
| 当量应力, σt | | MPa |  | | | | **$$097** |
| 当量应力校核 | | / | σt <= [B] | | | | **$$098** |