|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **U型管顶端热应力计算** | | | 计算单位 |  | | | |
| 计算依据 | | | | 《化工设备元件强度计算》设备中心站, 1992年, 第二版 | | | |
| **计 算 条 件** | | | | **简 图** | | | |
| 设计压力, Pd | | MPa | **$$001** | $12  $11  $10  $09  $13  $78  A | | | |
| 热段平均壁温, th | | °C | **$$002** |
| 冷段平均壁温, tc | | °C | **$$003** |
| 介质静压力, Ps | | MPa | **$$004** |
| 材料标准号 | | **$$005** | |
| 材料牌号/名称 | | **$$006** | |
| U形管外直径, do | | mm | **$$007** |
| 名义厚度, δn | | mm | **$$008** |
| 直段长度, Ls | | mm | **$$009** |
| 末端第一块折流板  到弯段切线距离, S0 | | mm | **$$010** |
| 末端第一块折流板  到第二块折流板距离, S1 | | mm | **$$011** |
| 末端第二块折流板  到第三块折流板距离, S2 | | mm | **$$012** |
| 弯曲半径, R | | mm | **$$013** |
| 腐蚀裕量, C2 | | mm | **$$038** |
| **材 料 特 性** | | | | | | | |
| 密度, ρ | | kg/m³ | **$$014** | 材料负偏差, C1 | | mm | **$$019** |
| 热 段 | 壁温下弹性模量, Eht | 103MPa | **$$015** | 冷 段 | 壁温下弹性模量, Ect | 103MPa | **$$020** |
| 常温-壁温  平均线膨胀系数, αh | 10-6/°C | **$$016** | 常温-壁温  平均线膨胀系数, αc | 10-6/°C | **$$021** |
| 壁温许用应力, [σ]ht | MPa | **$$017** | 壁温许用应力, [σ]ct | MPa | **$$022** |
| 壁温屈服点, RheL | MPa | **$$018** | 壁温屈服点, RceL | MPa | **$$023** |
| **过 程 参 数** | | | | | | | |
| 计算压力, Pc | | MPa | Pc = Pd + Ps | | | | **$$024** |
| 管子厚度附加量, C | | mm | C = C1 + C2 | | | | **$$025** |
| 管子有效厚度, δe | | mm |  | | | | **$$026** |
| U型管计算长度, L | | mm | L = Ls + R | | | | **$$027** |
| 管子平均半径, rm | | mm | rm = (do - δn)/2 | | | | **$$028** |
| 平均弹性模量, Emt | | 103MPa |  | | | | **$$029** |
| **腐 蚀 前 热 应 力 计 算** | | | | | | | |
| 弯曲段截面畸变挠曲系数, kn | | / |  | | | | **$$030** |
| 当量自由长度, Sn | | mm |  | | | | **$$031** |
| 应力系数, fn | | / |  | | | | **$$032** |
| 顶点A处热应力, σn | | MPa |  | | | | **$$033** |
| **腐 蚀 后 热 应 力 计 算** | | | | | | | |
| 弯曲段截面畸变挠曲系数, kc | | / |  | | | | **$$034** |
| 当量自由长度, Sc | | mm |  | | | | **$$035** |
| 应力系数, fc | | / |  | | | | **$$036** |
| 顶点A处热应力, σc | | MPa |  | | | | **$$037** |