|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cylindrical Shell Under Internal Pressure | | | Performed by | |  | | |
| In Accordance with | | ASME B&PV Code, Section VIII Division 1, 2017 | | | | | |
| **Input Data** | | | | **Sketch** | | | |
| Design Pressure, Pd | | MPa | **$$001** | $12  $11  $13 | | | |
| Operating Medium Static Head, Ps | | MPa | **$$002** |
| Test Medium Static Head, Pts | | MPa | **$$003** |
| Design Temperature, t | | °C | **$$004** |
| Material Name | | **$$005** | |
| Material Form | | **$$006** | |
| Internal Corrosion Allowance, Ci | | mm | **$$007** |
| External Corrosion Allowance, Ce | | mm | **$$008** |
| Longitudinal Seam Efficiency, El | | / | **$$009** |
| Circumferential Seam Efficiency, Ec | | / | **$$010** |
| Dimension | Inside Diameter, Di | mm | **$$011** |
| Cylinder Length, L | mm | **$$012** |
| Nominal Thickness, tn | mm | **$$013** |
| Finished(Minimum) Thickness, tf | mm | **$$014** |
| Pressure Test | | **$$015** | |
| **Material Properties** | | | | | | | |
| Material Density | | kg/m3 | **$$016** | Design Allowable Stress, S | | MPa | **$$018** |
| Ambient Yield Stress, Sy | | MPa | **$$017** | Ambient Allowable Stress, Sa | | MPa | **$$019** |
| P-No. | | / | **$$100** | Group No. | | / | **$$101** |
| **Intermediate Parameters** | | | | | | | |
| Calculating Pressure, Pc | | MPa |  | | | | **$$020** |
| Total Corrosion Allowance, C | | mm |  | | | | **$$021** |
| Effective Thickness, te | | mm |  | | | | **$$022** |
| New | Outside Diameter, Do | mm |  | | | | **$$023** |
| Inside Radius, Ri | mm |  | | | | **$$024** |
| Outside Radius, Ro | mm |  | | | | **$$025** |
| Corroded | Inside Diameter, Dic | mm |  | | | | **$$026** |
| Outside Diameter, Doc | mm |  | | | | **$$027** |
| Inside Radius, Ric | mm |  | | | | **$$028** |
| Outside Radius, Roc | mm |  | | | | **$$029** |
| **Strength Calculation** | | | | | | | |
| Circumferential  Required Thickness, trc | | mm |  | | | | **$$030** |
| Longitudinal  Required Thickness, trl | | mm |  | | | | **$$031** |
| Required Thickness, tr | | mm |  | | | | **$$032** |
| Check Thickness | | / |  | | | | **$$033** |
| Actual Stress Corroded, Sact | | MPa |  | | | | **$$034** |
| **Maximum Allowable Pressure** | | | | | | | |
| Max. Allowable Working Pressure  Corroded, MAWP | | MPa |  | | | | **$$035** |
| Max. Allowable Pressure  New and Cold, MAPnc | | MPa |  | | | | **$$036** |
| **Pressure Test** | | | | | | | |
| Pressure Factor, η | | / |  | | | | **$$037** |
| Test Pressure, Pt | | MPa |  | | | | **$$038** |
| Calculating Test Pressure, Ptc | | MPa |  | | | | **$$039** |
| Stress Factor, ζ | | / |  | | | | **$$040** |
| Allowable Stress, Sall,test | | MPa |  | | | | **$$041** |
| New | Actual Stress, Sact,test,new | MPa |  | | | | **$$042** |
| Stress Check Result | / |  | | | | **$$043** |
| Cod. | Actual Stress, Sact,test,cod | MPa |  | | | | **$$044** |
| Stress Check Result | / |  | | | | **$$045** |
| **Forming Strains** | | | | | | | |
| Final Mean Radius, Rf | | mm |  | | | | **$$046** |
| Original Mean Radius, Rorg | | mm |  | | | | **$$047** |
| Calculated Forming Strain, εf | | % |  | | | | **$$048** |
| **Part Properties** | | | | | | | |
| New | Outside Surface Area, Ao,n | m2 | **$$049** | Internal Surface Area, Ai,n | | m2 | **$$051** |
| Internal Volume, Vi,n | m3 | **$$050** | Metal Weight, Wn | | kg | **$$052** |
| Cod. | Outside Surface Area, Ao,c | m2 | **$$053** | Internal Surface Area, Ai,c | | m2 | **$$055** |
| Internal Volume, Vi,c | m3 | **$$054** | Metal Weight, Wc | | kg | **$$056** |