3.10 Material Test Requirements
3.9 Supplemental Requirements for Hubs Machined From Plate
3.8 Supplemental Requirements for Castings
3.7 Supplemental Requirements for Bolting
3.6 Supplemental Requirements for Nonferrous Materials

3.15 Design Fatigue Curves
3.16 Design Values for Temperatures Colder Than 30°C (20°F)
3.14 Physical Properties
3.13 Strength Parameters
3.12 Allowable Design Stresses
3.11 Material Toughness Requirements
3.10 Material Test Requirements
3.9 Supplemental Requirements for Hubs Machined From Plate
3.8 Supplemental Requirements for Castings
3.7 Supplemental Requirements for Bolting
3.6 Supplemental Requirements for Nonferrous Materials

4.20 Design Rules for Flexible Shell Element Expansion Joints
4.19 Design Rules for Bellows Expansion Joints
4.18 Design Rules for Shell-and-Tube Heat Exchangers
4.17 Design Rules for Clamped Connections
4.16 Design Rules for Flanged Joints
4.15 Design Rules for Supports and Attachments
4.14 Evaluation of Vessels Outside of Tolerance
4.13 Design Rules for Layered Vessels
4.12 Design Rules for Noncircular Vessels
4.11 Design Rules for Jacketed Vessels
4.10 Design Rules for Ligaments
4.9 Design Rules for Braced and Stayed Surfaces
4.8 Design Rules for Quick-Actuating (Quick-Opening) Closures
4.7 Design Rules for Spherically Dished Bolted Covers
4.6 Design Rules for Flat Heads
4.5 Design Rules for Openings in Shells and Heads
4.4 Design of Shells Under External Pressure and Allowable Compressive Stresses
4.3 Design Rules for Shells Under Internal Pressure
4.2 Design Rules for Welded Joints
4.1 General Requirements

Part 4 Design by Rule Requirements
4.1 General Requirements
4.2 Design Rules for Welded Joints
4.3 Design Rules for Shells Under Internal Pressure
4.4 Design of Shells Under External Pressure and Allowable Compressive Stresses
4.5 Design Rules for Openings in Shells and Heads
4.6 Design Rules for Flat Heads
4.7 Design Rules for Spherically Dished Bolted Covers
4.8 Design Rules for Quick-Actuating (Quick-Opening) Closures
4.9 Design Rules for Braced and Stayed Surfaces
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4.17 Design Rules for Clamped Connections
4.18 Design Rules for Shell-and-Tube Heat Exchangers
4.19 Design Rules for Bellows Expansion Joints
4.20 Design Rules for Flexible Shell Element Expansion Joints

Part 5 Design by Analysis Requirements
5.1 General Requirements
5.2 Protection Against Plastic Collapse
ANNEX 3-C
ISO MATERIAL GROUP NUMBERS

(Currently Not Used)
### Table 7.1
Examination Groups for Pressure Vessels

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Examination Group [Note (1)]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1a</td>
</tr>
<tr>
<td>Maximum thickness of governing</td>
<td>Unlimited [Note (4)]</td>
</tr>
<tr>
<td>welded joints</td>
<td></td>
</tr>
<tr>
<td>Welding process</td>
<td>Unrestricted [Note (4)]</td>
</tr>
<tr>
<td>Design basis</td>
<td>Part 4 or Part 5 of this Division</td>
</tr>
<tr>
<td>NOTES:</td>
<td>(1) All Examination Groups require 100% visual examination to the maximum extent possible.</td>
</tr>
</tbody>
</table>