

HASTELLOY[®] C-22[®] alloy

Corrosion Resistance of Welds

To assess the resistance of welds to corrosion, Haynes International has chosen to test all-weld-metal samples, taken from the quadrants of cruciform assemblies, created using multiple gas metal arc (MIG) weld passes. Predictably, the inhomogeneous nature of weld microstructures leads to higher corrosion rates (than with homogeneous, wrought products). Nevertheless, HASTELLOY[®] C-22[®] alloy exhibits excellent resistance to the key, inorganic acids, even in welded form, as shown in the following table:

| Chemical | Concentration | Temperature | | Corrosion Rate | | | |
|--------------------------------|---------------|-------------|----|----------------|-------|--------------------|-------|
| | wt.% | °F | °C | Weld Metal | | Wrought Base Metal | |
| | | | | mpy | mm/y | mpy | mm/y |
| H ₂ SO ₄ | 30 | 150 | 66 | 0.6 | 0.02 | 0.4 | 0.01 |
| H ₂ SO ₄ | 50 | 150 | 66 | 9.3 | 0.24 | 0.8 | 0.02 |
| H ₂ SO ₄ | 70 | 150 | 66 | 10.3 | 0.26 | 11.0 | 0.28 |
| H ₂ SO ₄ | 90 | 150 | 66 | 18.5 | 0.47 | 13.4 | 0.34 |
| HCl | 5 | 100 | 38 | <0.1 | <0.01 | <0.1 | <0.01 |
| HCl | 10 | 100 | 38 | <0.1 | <0.01 | 0.4 | 0.01 |
| HCl | 15 | 100 | 38 | 11.1 | 0.28 | 9.4 | 0.24 |
| HCl | 20 | 100 | 38 | 10.2 | 0.26 | 7.9 | 0.20 |