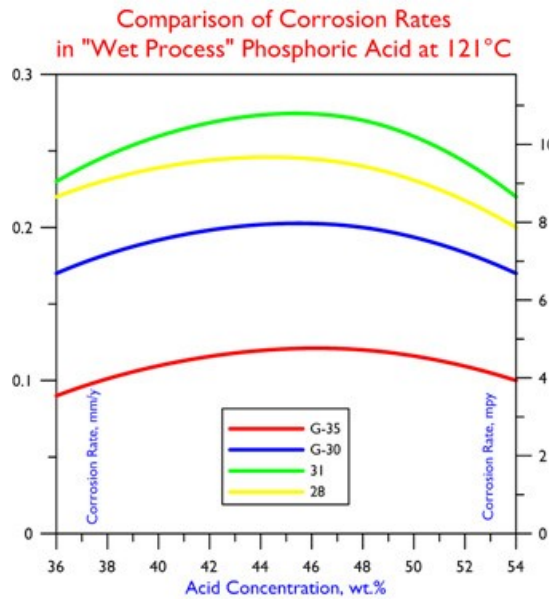


## HASTELLOY® G-35® alloy

Advances in materials research have led to the development of HASTELLOY® G-35® alloy, a high chromium nickel-based alloy. This alloy was designed to extend the useful service life of fabricated components in wet process phosphoric acid (WPA) production. G-35® alloy is considered an upgrade to G-30® alloy. The high level of chromium will provide excellent resistance to corrosion in highly oxidizing media and acidic chloride environments. In addition to resistance to general corrosion, G-35® alloy has outstanding resistance to pitting, crevice corrosion, and stress corrosion cracking.



### Nominal Composition (wt%):

| Ni              | Co | Cr   | Mo  | W    | Fe | Mn   | Al   | Si   | C     | Cu   |
|-----------------|----|------|-----|------|----|------|------|------|-------|------|
| 58 <sup>a</sup> | 1* | 33.2 | 8.1 | 0.6* | 2* | 0.5* | 0.4* | 0.6* | 0.05* | 0.3* |

<sup>a</sup>As Balance \*Maximum

### Resistance to Stress Corrosion Cracking:

| Alloy        | Time to Cracking              |
|--------------|-------------------------------|
| 316L         | 2 h                           |
| 254SMO       | 24 h                          |
| 28           | 36 h                          |
| 31           | 36 h                          |
| G-30®        | 168 h                         |
| <b>G-35®</b> | <b>No Cracking in 1,008 h</b> |
| 625          | No Cracking in 1,008 h        |

## Resistance to Pitting and Crevice Corrosion:

| Alloy             | Critical Pitting Temperature<br>in Acidified 6% FeCl <sub>3</sub> |      | Critical Crevice Temperature<br>in Acidified 6% FeCl <sub>3</sub> |      |
|-------------------|-------------------------------------------------------------------|------|-------------------------------------------------------------------|------|
|                   | °F                                                                | °C   | °F                                                                | °C   |
| 316L              | 59                                                                | 15   | 32                                                                | 0    |
| 254SMO            | 140                                                               | 60   | 86                                                                | 30   |
| 28                | 113                                                               | 45   | 64                                                                | 17.5 |
| 31                | 163                                                               | 72.5 | 109                                                               | 42.5 |
| G-30 <sup>®</sup> | 154                                                               | 67.5 | 100                                                               | 37.5 |
| G-35 <sup>®</sup> | 203                                                               | 95   | 113                                                               | 45   |
| 625               | 212                                                               | 100  | 104                                                               | 40   |

## Tensile Strength and Elongation:

| Form  | Thickness/<br>Bar Diameter |      | Test<br>Temperature |     | 0.2% Offset<br>Yield Strength |     | Ultimate Tensile<br>Strength |     | Elongation<br>% |
|-------|----------------------------|------|---------------------|-----|-------------------------------|-----|------------------------------|-----|-----------------|
|       | in                         | mm   | °F                  | °C  | ksi                           | MPa | ksi                          | MPa |                 |
| Sheet | 0.125                      | 3.2  | RT                  | RT  | 50                            | 345 | 107                          | 738 | 60              |
| Sheet | 0.125                      | 3.2  | 200                 | 93  | 43                            | 296 | 101                          | 696 | 63              |
| Sheet | 0.125                      | 3.2  | 400                 | 204 | 36                            | 248 | 93                           | 641 | 64              |
| Sheet | 0.125                      | 3.2  | 600                 | 316 | 31                            | 214 | 89                           | 614 | 70              |
| Sheet | 0.125                      | 3.2  | 800                 | 427 | 30                            | 207 | 86                           | 593 | 74              |
| Sheet | 0.125                      | 3.2  | 1000                | 538 | 27                            | 186 | 80                           | 552 | 68              |
| Sheet | 0.125                      | 3.2  | 1200                | 649 | 26                            | 179 | 75                           | 517 | 68              |
| Plate | 0.5                        | 12.7 | RT                  | RT  | 46                            | 317 | 100                          | 689 | 72              |
| Plate | 0.5                        | 12.7 | 200                 | 93  | 41                            | 283 | 97                           | 669 | 74              |
| Plate | 0.5                        | 12.7 | 400                 | 204 | 33                            | 228 | 88                           | 607 | 75              |
| Plate | 0.5                        | 12.7 | 600                 | 316 | 29                            | 200 | 82                           | 565 | 71              |
| Plate | 0.5                        | 12.7 | 800                 | 427 | 30                            | 207 | 78                           | 538 | 77              |
| Plate | 0.5                        | 12.7 | 1000                | 538 | 26                            | 179 | 72                           | 496 | 75              |
| Plate | 0.5                        | 12.7 | 1200                | 649 | 24                            | 165 | 68                           | 469 | 74              |
| Bar   | 1                          | 25.4 | RT                  | RT  | 46                            | 317 | 103                          | 710 | 66              |
| Bar   | 1                          | 25.4 | 200                 | 93  | 41                            | 283 | 98                           | 676 | 70              |
| Bar   | 1                          | 25.4 | 400                 | 204 | 35                            | 241 | 89                           | 614 | 71              |
| Bar   | 1                          | 25.4 | 600                 | 316 | 30                            | 207 | 84                           | 579 | 71              |
| Bar   | 1                          | 25.4 | 800                 | 427 | 31                            | 214 | 81                           | 558 | 73              |
| Bar   | 1                          | 25.4 | 1000                | 538 | 28                            | 193 | 75                           | 517 | 72              |
| Bar   | 1                          | 25.4 | 1200                | 649 | 23                            | 159 | 69                           | 476 | 71              |

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