# Austenitic Stainless Steel

201, 202, 301, 302, 304, 304L 6, 305, 316, 316L 6, 321 6, 347 6

DATUM ALLOYS

Datum Alloys Limited, Unit B, Bridge Works, Station Yard Industrial Estate, Kingsbridge, Devon TQ7 1ES, UK. Tel: +44 (0) 1548 855 900 Fax: +44 (0) 1548 855 901

## NOMINAL CHEMICAL COMPOSITION:

| Alloy No. | C | Cr | Ni | Mn | Mo | N | Other |
|---|---|---|---|---|---|---|---|
| **201** | 0.15 | 17.00 | 4.50 | 6.50 | | .25 Max | |
| **202** | 0.15 | 18.00 | 5.50 | 8.75 | | .25 Max | |
| **301** | 0.15 | 17.00 | 7.00 | 2 Max | | | |
| **302** | 0.15 | 18.00 | 9.00 | 2 Max | | | |
| **304** | 0.08 | 19.00 | 9.25 | 2 Max | | .10 Max | |
| **304L 6** | 0.03 | 19.00 | 10.00 | 2 Max | | .10 Max | |
| **305** | 0.12 | 18.00 | 11.75 | 2 Max | | | |
| **316** | 0.08 | 17.00 | 12.00 | 2 Max | 2.50 | | |
| **316L 6** | 0.03 | 17.00 | 12.00 | 2 Max | 2.50 | | |
| **321 6** | 0.08 | 18.00 | 10.50 | 2 Max | | .10 Max | Ti 5X (C+N) Min .70 Max |
| **347 6** | 0.08 | 18.00 | 11.00 | 2 Max | | Cb + TA | 10X C Min 1.00 Max |

## APPLICABLE SPECIFICATIONS:

| Alloy No. | EU | USA | | Germany | France |
|---|---|---|---|---|---|
| | European Designation | ASTM | AMS Spec. No. | DIN | AFNOR |
| **201** | | A666 | | | |
| **202** | X12 Cr Ni Mn 19.9 | A666 | | | Z8CNM19.8 |
| **301** | X12 Cr Ni 177 | A666 | 5517-5519 | 1.4310 | Z12CN17.07 |
| **302** | X10 Cr Ni 18.8 | A666 | 5516 | 1.4300 | Z10CN18.09 |
| **304** | X5 Cr Ni 1810 | A666 | 5513 | 1.4301 | Z6CN18.09 |
| **304L 6** | X2 Cr Ni 1911 | A666 | 5511 | 1.4306 | Z2CN18.10 |
| **305** | X5 Cr Ni 1812E | A167 | 5514 | | Z8CN18.12 |
| **316** | X5 Cr Ni Mo 17122 | A666 | 5524 | 1.4401 | Z6CND17.11 |
| **316L 6** | X2 Cr Ni Mo 17132 | A666 | 5507 | 1.4404 | Z2CND17.12 |
| **321 6** | | A167 | 5510 | | |
| **347 6** | | | 5512 | 1.4550 | Z2CND19.15 |

## MECHANICAL PROPERTIES:

| Alloy No. | Temper | Tensile Strength $Nmm^{-2}$ | Yield Strength $Nmm^{-2}$ | Elongation % in 50.8mm |
|---|---|---|---|---|
| **201** | Annealed | 655 Min | 310 Min | 40 Min |
| | ⅛ Hard | 690 - 862 | 379 Min | 40 Min |
| | ¼ Hard | 862 - 1034 | 517 Min | 25 Min |
| | ½ Hard | 1034 - 1207 | 759 Min | 15 Min |
| | ¾ Hard | 1207 - 1379 | 931 Min | 10 Min |
| | Full Hard | 1276 Min | 966 Min | 8 Min |
| | Spring | 1379 Min | | 1 Min |
| **202** | Annealed | 621 Min | 310 Min | 40 Min |
| | ⅛ Hard | 862 - 1034 | | |
| | ¼ Hard | | 517 Min | 12 Min |

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## MECHANICAL PROPERTIES: continued

| Alloy No. | Temper | Tensile Strength $Nmm^{-2}$ | Yield Strength $Nmm^{-2}$ | Elongation % in 50.8mm |
|---|---|---|---|---|
| **301** | Annealed | 621 - 793 | 207 Min | 40 Min |
| | ⅛ Hard | 690 - 862 | 379 Min | 40 Min |
| | ¼ Hard | 862 - 1034 | 517 Min | 25 Min |
| | ½ Hard | 1034 - 1207 | 759 Min | 15 Min |
| | ¾ Hard | 1207 - 1379 | 931 Min | 10 Min |
| | Full Hard | 1276 Min | 966 Min | 8 Min |
| | Spring | 1379 Min | 1276 Min | 1 Min |
| | SPL Spring | 1931 Min | | 1 Nom 7 |
| **302** | Annealed | 517 - 759 | 207 - 414 | 40 Min |
| | ⅛ Hard | 690 - 862 | 379 | 35 Min |
| | ¼ Hard | 862 - 1034 | 517 | 10 Min |
| | ½ Hard | 1034 - 1207 | 759 | 9 Min |
| | ¾ Hard | 1207 - 1379 | 931 | 5 Min |
| | Full Hard | 1276 Min | 966 | 3 Min |
| | Spring | 1379 Min | | 1 Min |
| | SPL Spring | | 1724 Min | 1 Min |
| **304** | Annealed | 517 - 690 | 207 | 40 Min |
| | ⅛ Hard | 690 - 862 | 379 | 35 Min |
| | ¼ Hard | 862 - 1034 | 517 | 10 Min |
| | ½ Hard | 1034 - 1207 | 759 | 6 Min |
| | ¾ Hard | 1207 - 1379 | 931 | 3 Min |
| | Full Hard | 1276 Min | 966 | 1 Min |
| | Spring | 1379 Min | | 1 Min |
| **304L 6** | Annealed | 483 - 690 | 172 Min | 40 Min |
| | ⅛ Hard | 690 - 862 | 379 Min | 35 Min |
| | ¼ Hard | 862 - 1034 | 517 Min | 8 Min |
| | ½ Hard | 1034 - 1207 | 759 Min | 5 Min |
| | ¾ Hard | 1207 - 1379 | 931 Min | 2 Min |
| | Full Hard | 1276 Min | 966 Min | 1 Min |
| | Spring | 1379 Min | | 1 Min |
| **305** | Annealed | 483 - 690 | 172 Min | 40 Min |
| | ⅛ Hard | 690 - 862 | 379 Min | 20 Min |
| | ¼ Hard | 862 - 1034 | 517 Min | 6 Min |
| **316** | Annealed | 517 - 690 | 207 Min | 40 Min |
| | ⅛ Hard | 690 - 862 | 379 Min | 30 Min |
| | ¼ Hard | 862 - 1034 | 517 Min | 10 Min |
| | ½ Hard | 1034 - 1207 | 759 Min | 6 Min |
| | ¾ Hard | 1207 - 1379 | 931 Min | 3 Min |
| | Full Hard | 1276 Min | 966 Min | 1 Min |
| **316L 6** | Annealed | 483 - 690 | 172 Min | 40 Min |
| | ⅛ Hard | 690 - 862 | 379 Min | 25 Min |
| | ¼ Hard | 862 - 1034 | 517 Min | 8 Min |
| | ½ Hard | 1034 - 1207 | 759 Min | 5 Min |
| | ¾ Hard | 1207 - 1379 | 931 Min | 2 Min |
| | Full Hard | 1276 Min | 966 Min | 1 Min |
| **321 6** | Annealed | 517 - 758 | 207 Min | 40 Min |
| **347 6** | Annealed | 517 - 793 | 207 Min | 40 Min |

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## PHYSICAL PROPERTIES:

| Alloy No. | Density $gcm^{-3}$ | Modulus of Elasticity GPa | Melting Point ˚C |
|---|---|---|---|
| **201** | 7.94 | 197 | |
| **202** | 7.94 | 197 | |
| **301** | 8.03 | 193 | |
| **302** | 7.94 | 193 | 1400 - 1420 |
| **304** | 7.94 | 193 | 1400 - 1455 |
| **304L 6** | 7.94 | 193 | |
| **305** | 8.03 | 193 | |
| **316** | 7.92 | 193 | 1370 - 1400 |
| **316L 6** | 7.92 | 193 | |
| **321 6** | 7.89 | 193 | |
| **347 6** | 8.03 | 193 | |

## THERMAL PROPERTIES:

| Alloy No. | Thermal Conductivity $Wm^{-1}K^{-1}$ | Coefficient of Expansion 0 - 100˚C x $10^{-6}$ $K^{-1}$ |
|---|---|---|
| **201** | 16.3 | 15.7 |
| **202** | 16.3 | 17.5 |
| **301** | 16.3 | 16.9 |
| **302** | 16.3 | 17.3 |
| **304** | 16.3 | 17.3 |
| **304L 6** | 16.3 | 17.3 |
| **305** | 16.3 | 17.3 |
| **316** | 16.3 | 16.0 |
| **316L 6** | 16.1 | 16.0 |
| **321 6** | 16.1 | 16.7 |
| **347 6** | 16.1 | 16.7 |

## ELECTRICAL PROPERTIES:

| Alloy No. | Electrical Resistivity µOhm cm |
|---|---|
| **201** | 70 |
| **202** | 71 |
| **301** | 72 |
| **302** | 72 |
| **304** | 72 |
| **304L 6** | 72 |
| **305** | 72 |
| **316** | 74 |
| **316L 6** | 74 |
| **321 6** | 72 |
| **347 6** | 72 |