

## Constellium Fortal® Aluminum Alloy

Category : Metal , Nonferrous Metal , Aluminum Alloy , 5000 Series Aluminum Alloy

### Material Notes:

Fortal® plates are optimized to provide high mechanical strength, combined with good shape stability and excellent machinability. Typical applications include sheet forming tools, base plates for moulds and tools, robotics, machine housings etc. Information provided by manufacturer

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Constellium-Fortal-Aluminum-Alloy.php](http://www.lookpolymers.com/polymer_Constellium-Fortal-Aluminum-Alloy.php)

| Physical Properties | Metric    | English                  | Comments |
|---------------------|-----------|--------------------------|----------|
| Density             | 2.81 g/cc | 0.102 lb/in <sup>3</sup> |          |

| Mechanical Properties | Metric                    | English                   | Comments         |
|-----------------------|---------------------------|---------------------------|------------------|
| Tensile Strength      | >= 450 MPa                | >= 65300 psi              |                  |
|                       | @Thickness 180 - 200 mm   | @Thickness 7.09 - 7.87 in |                  |
|                       | >= 470 MPa                | >= 68200 psi              |                  |
|                       | @Thickness 140 - 160 mm   | @Thickness 5.51 - 6.30 in |                  |
|                       | >= 480 MPa                | >= 69600 psi              |                  |
|                       | @Thickness 120 - 140 mm   | @Thickness 4.72 - 5.51 in |                  |
|                       | >= 480 MPa                | >= 69600 psi              |                  |
|                       | @Thickness 160 - 180 mm   | @Thickness 6.30 - 7.09 in |                  |
|                       | >= 485 MPa                | >= 70300 psi              |                  |
|                       | @Thickness 100 - 120 mm   | @Thickness 3.94 - 4.72 in |                  |
|                       | >= 495 MPa                | >= 71800 psi              |                  |
|                       | @Thickness 80.0 - 100 mm  | @Thickness 3.15 - 3.94 in |                  |
|                       | >= 500 MPa                | >= 72500 psi              |                  |
|                       | @Thickness 60.0 - 80.0 mm | @Thickness 2.36 - 3.15 in |                  |
|                       | 505 MPa                   | 73200 psi                 | Typical Strength |
|                       | @Thickness 180 - 200 mm   | @Thickness 7.09 - 7.87 in |                  |

| Mechanical Properties | 510 MPa<br>Metric         | 74000 psi<br>English        | Comments<br>Typical Strength |
|-----------------------|---------------------------|-----------------------------|------------------------------|
|                       | @Thickness 160 - 180 mm   | @Thickness 6.30 - 7.09 in   |                              |
|                       | 515 MPa                   | 74700 psi                   | Typical Strength             |
|                       | @Thickness 140 - 160 mm   | @Thickness 5.51 - 6.30 in   |                              |
|                       | 520 MPa                   | 75400 psi                   | Typical Strength             |
|                       | @Thickness 120 - 140 mm   | @Thickness 4.72 - 5.51 in   |                              |
|                       | 525 MPa                   | 76100 psi                   | Typical Strength             |
|                       | @Thickness 60.0 - 80.0 mm | @Thickness 2.36 - 3.15 in   |                              |
|                       | 530 MPa                   | 76900 psi                   | Typical Strength             |
|                       | @Thickness 100 - 120 mm   | @Thickness 3.94 - 4.72 in   |                              |
|                       | >= 530 MPa                | >= 76900 psi                |                              |
|                       | @Thickness 50.0 - 60.0 mm | @Thickness 1.97 - 2.36 in   |                              |
|                       | 535 MPa                   | 77600 psi                   | Typical Strength             |
|                       | @Thickness 80.0 - 100 mm  | @Thickness 3.15 - 3.94 in   |                              |
|                       | >= 540 MPa                | >= 78300 psi                |                              |
|                       | @Thickness 40.0 - 50.0 mm | @Thickness 1.57 - 1.97 in   |                              |
|                       | >= 550 MPa                | >= 79800 psi                |                              |
|                       | @Thickness 25.0 - 40.0 mm | @Thickness 0.984 - 1.57 in  |                              |
|                       | >= 555 MPa                | >= 80500 psi                |                              |
|                       | @Thickness 6.50 - 12.0 mm | @Thickness 0.256 - 0.472 in |                              |
|                       | >= 555 MPa                | >= 80500 psi                |                              |
|                       | @Thickness 12.0 - 25.0 mm | @Thickness 0.472 - 0.984 in |                              |
|                       | 560 MPa                   | 81200 psi                   | Typical Strength             |
|                       | @Thickness 50.0 - 60.0 mm | @Thickness 1.97 - 2.36 in   |                              |
|                       | 570 MPa                   | 82700 psi                   | Typical Strength             |
|                       | @Thickness 40.0 - 50.0 mm | @Thickness 1.57 - 1.97 in   |                              |

| Mechanical Properties   | <sup>mm</sup><br>Metric                   | <sup>in</sup><br>English                  | Comments         |
|-------------------------|-------------------------------------------|-------------------------------------------|------------------|
|                         | 580 MPa                                   | 84100 psi                                 |                  |
|                         | @Thickness 25.0 - 40.0 mm                 | @Thickness 0.984 - 1.57 in                | Typical Strength |
|                         | 590 MPa                                   | 85600 psi                                 |                  |
|                         | @Thickness 6.50 - 12.0 mm                 | @Thickness 0.256 - 0.472 in               | Typical Strength |
|                         | 590 MPa                                   | 85600 psi                                 |                  |
|                         | @Thickness 12.0 - 25.0 mm                 | @Thickness 0.472 - 0.984 in               | Typical Strength |
| Tensile Strength, Yield | >= 380 MPa                                | >= 55100 psi                              |                  |
|                         | @Strain 0.200 %, Thickness 180 - 200 mm   | @Strain 0.200 %, Thickness 7.09 - 7.87 in |                  |
|                         | >= 390 MPa                                | >= 56600 psi                              |                  |
|                         | @Strain 0.200 %, Thickness 160 - 180 mm   | @Strain 0.200 %, Thickness 6.30 - 7.09 in |                  |
|                         | >= 400 MPa                                | >= 58000 psi                              |                  |
|                         | @Strain 0.200 %, Thickness 140 - 160 mm   | @Strain 0.200 %, Thickness 5.51 - 6.30 in |                  |
|                         | >= 405 MPa                                | >= 58700 psi                              |                  |
|                         | @Strain 0.200 %, Thickness 120 - 140 mm   | @Strain 0.200 %, Thickness 4.72 - 5.51 in |                  |
|                         | >= 410 MPa                                | >= 59500 psi                              |                  |
|                         | @Strain 0.200 %, Thickness 100 - 120 mm   | @Strain 0.200 %, Thickness 3.94 - 4.72 in |                  |
|                         | >= 415 MPa                                | >= 60200 psi                              |                  |
|                         | @Strain 0.200 %, Thickness 80.0 - 100 mm  | @Strain 0.200 %, Thickness 3.15 - 3.94 in |                  |
|                         | >= 420 MPa                                | >= 60900 psi                              |                  |
|                         | @Strain 0.200 %, Thickness 60.0 - 80.0 mm | @Strain 0.200 %, Thickness 2.36 - 3.15 in |                  |
|                         | >= 445 MPa                                | >= 64500 psi                              |                  |
|                         | @Strain 0.200 %, Thickness 50.0 - 60.0 mm | @Strain 0.200 %, Thickness 1.97 - 2.36 in |                  |

| Mechanical Properties | mm<br>Metric                              | English                                     | Comments         |
|-----------------------|-------------------------------------------|---------------------------------------------|------------------|
|                       | 445 MPa                                   | 64500 psi                                   |                  |
|                       | @Strain 0.200 %, Thickness 60.0 - 80.0 mm | @Strain 0.200 %, Thickness 2.36 - 3.15 in   | Typical Strength |
|                       | 445 MPa                                   | 64500 psi                                   |                  |
|                       | @Strain 0.200 %, Thickness 180 - 200 mm   | @Strain 0.200 %, Thickness 7.09 - 7.87 in   | Typical Strength |
|                       | 450 MPa                                   | 65300 psi                                   |                  |
|                       | @Strain 0.200 %, Thickness 160 - 180 mm   | @Strain 0.200 %, Thickness 6.30 - 7.09 in   | Typical Strength |
|                       | 455 MPa                                   | 66000 psi                                   |                  |
|                       | @Strain 0.200 %, Thickness 140 - 160 mm   | @Strain 0.200 %, Thickness 5.51 - 6.30 in   | Typical Strength |
|                       | 465 MPa                                   | 67400 psi                                   |                  |
|                       | @Strain 0.200 %, Thickness 120 - 140 mm   | @Strain 0.200 %, Thickness 4.72 - 5.51 in   | Typical Strength |
|                       | >= 470 MPa                                | >= 68200 psi                                |                  |
|                       | @Strain 0.200 %, Thickness 40.0 - 50.0 mm | @Strain 0.200 %, Thickness 1.57 - 1.97 in   |                  |
|                       | >= 475 MPa                                | >= 68900 psi                                |                  |
|                       | @Strain 0.200 %, Thickness 25.0 - 40.0 mm | @Strain 0.200 %, Thickness 0.984 - 1.57 in  |                  |
|                       | 475 MPa                                   | 68900 psi                                   |                  |
|                       | @Strain 0.200 %, Thickness 100 - 120 mm   | @Strain 0.200 %, Thickness 3.94 - 4.72 in   | Typical Strength |
|                       | 480 MPa                                   | 69600 psi                                   |                  |
|                       | @Strain 0.200 %, Thickness 80.0 - 100 mm  | @Strain 0.200 %, Thickness 3.15 - 3.94 in   | Typical Strength |
|                       | >= 480 MPa                                | >= 69600 psi                                |                  |
|                       | @Strain 0.200 %, Thickness 6.50 - 12.0 mm | @Strain 0.200 %, Thickness 0.256 - 0.472 in |                  |
|                       | >= 480 MPa                                | >= 69600 psi                                |                  |

| Mechanical Properties | Metric<br>@Strain 0.200 %,<br>Thickness 12.0 - 25.0<br>mm | English<br>@Strain 0.200 %,<br>Thickness 0.472 -<br>0.984 in | Comments         |
|-----------------------|-----------------------------------------------------------|--------------------------------------------------------------|------------------|
|                       | 485 MPa                                                   | 70300 psi                                                    | Typical Strength |
|                       | @Strain 0.200 %,<br>Thickness 50.0 - 60.0<br>mm           | @Strain 0.200 %,<br>Thickness 1.97 - 2.36 in                 |                  |
|                       | 500 MPa                                                   | 72500 psi                                                    | Typical Strength |
|                       | @Strain 0.200 %,<br>Thickness 40.0 - 50.0<br>mm           | @Strain 0.200 %,<br>Thickness 1.57 - 1.97 in                 |                  |
|                       | 520 MPa                                                   | 75400 psi                                                    | Typical Strength |
|                       | @Strain 0.200 %,<br>Thickness 25.0 - 40.0<br>mm           | @Strain 0.200 %,<br>Thickness 0.984 - 1.57<br>in             |                  |
|                       | 525 MPa                                                   | 76100 psi                                                    | Typical Strength |
|                       | @Strain 0.200 %,<br>Thickness 6.50 - 12.0<br>mm           | @Strain 0.200 %,<br>Thickness 0.256 -<br>0.472 in            |                  |
|                       | 525 MPa                                                   | 76100 psi                                                    | Typical Strength |
|                       | @Strain 0.200 %,<br>Thickness 12.0 - 25.0<br>mm           | @Strain 0.200 %,<br>Thickness 0.472 -<br>0.984 in            |                  |
| Elongation at Break   | >= 2.0 %                                                  | >= 2.0 %                                                     |                  |
|                       | @Thickness 180 - 200<br>mm                                | @Thickness 7.09 - 7.87<br>in                                 |                  |
|                       | >= 3.0 %                                                  | >= 3.0 %                                                     |                  |
|                       | @Thickness 160 - 180<br>mm                                | @Thickness 6.30 - 7.09<br>in                                 |                  |
|                       | >= 4.0 %                                                  | >= 4.0 %                                                     |                  |
|                       | @Thickness 120 - 140<br>mm                                | @Thickness 4.72 - 5.51<br>in                                 |                  |
|                       | >= 4.0 %                                                  | >= 4.0 %                                                     |                  |
|                       | @Thickness 140 - 160<br>mm                                | @Thickness 5.51 - 6.30<br>in                                 |                  |
|                       | >= 5.0 %                                                  | >= 5.0 %                                                     |                  |
|                       | @Thickness 60.0 - 80.0<br>mm                              | @Thickness 2.36 - 3.15<br>in                                 |                  |
|                       | >= 5.0 %                                                  | >= 5.0 %                                                     |                  |
|                       | @Thickness 80.0 - 100<br>mm                               | @Thickness 3.15 - 3.94<br>in                                 |                  |

| Mechanical Properties | $\geq 5.0\%$<br>Metric    | $\geq 5.0\%$<br>English     | Comments           |
|-----------------------|---------------------------|-----------------------------|--------------------|
|                       | @Thickness 100 - 120 mm   | @Thickness 3.94 - 4.72 in   |                    |
|                       | 5.0 %                     | 5.0 %                       | Typical Elongation |
|                       | @Thickness 160 - 180 mm   | @Thickness 6.30 - 7.09 in   |                    |
|                       | 5.0 %                     | 5.0 %                       | Typical Elongation |
|                       | @Thickness 180 - 200 mm   | @Thickness 7.09 - 7.87 in   |                    |
|                       | 6.0 %                     | 6.0 %                       | Typical Elongation |
|                       | @Thickness 140 - 160 mm   | @Thickness 5.51 - 6.30 in   |                    |
|                       | $\geq 6.0\%$              | $\geq 6.0\%$                |                    |
|                       | @Thickness 25.0 - 40.0 mm | @Thickness 0.984 - 1.57 in  |                    |
|                       | $\geq 6.0\%$              | $\geq 6.0\%$                |                    |
|                       | @Thickness 40.0 - 50.0 mm | @Thickness 1.57 - 1.97 in   |                    |
|                       | $\geq 6.0\%$              | $\geq 6.0\%$                |                    |
|                       | @Thickness 50.0 - 60.0 mm | @Thickness 1.97 - 2.36 in   |                    |
|                       | $\geq 7.0\%$              | $\geq 7.0\%$                |                    |
|                       | @Thickness 12.0 - 25.0 mm | @Thickness 0.472 - 0.984 in |                    |
|                       | 7.0 %                     | 7.0 %                       | Typical Elongation |
|                       | @Thickness 120 - 140 mm   | @Thickness 4.72 - 5.51 in   |                    |
|                       | 8.0 %                     | 8.0 %                       | Typical Elongation |
|                       | @Thickness 60.0 - 80.0 mm | @Thickness 2.36 - 3.15 in   |                    |
|                       | 8.0 %                     | 8.0 %                       | Typical Elongation |
|                       | @Thickness 80.0 - 100 mm  | @Thickness 3.15 - 3.94 in   |                    |
|                       | $\geq 8.0\%$              | $\geq 8.0\%$                |                    |
|                       | @Thickness 6.50 - 12.0 mm | @Thickness 0.256 - 0.472 in |                    |
|                       | 8.0 %                     | 8.0 %                       | Typical Elongation |
|                       | @Thickness 100 - 120 mm   | @Thickness 3.94 - 4.72 in   |                    |

| Mechanical Properties | <sup>mm</sup><br>Metric                | <sup>in</sup><br>English                | Comments           |
|-----------------------|----------------------------------------|-----------------------------------------|--------------------|
|                       | 9.0 %<br><br>@Thickness 25.0 - 40.0 mm | 9.0 %<br><br>@Thickness 0.984 - 1.57 in | Typical Elongation |
|                       | 9.0 %<br><br>@Thickness 40.0 - 50.0 mm | 9.0 %<br><br>@Thickness 1.57 - 1.97 in  | Typical Elongation |
|                       | 9.0 %<br><br>@Thickness 50.0 - 60.0 mm | 9.0 %<br><br>@Thickness 1.97 - 2.36 in  | Typical Elongation |
|                       | 10 %<br><br>@Thickness 12.0 - 25.0 mm  | 10 %<br><br>@Thickness 0.472 - 0.984 in | Typical Elongation |
|                       | 11 %<br><br>@Thickness 6.50 - 12.0 mm  | 11 %<br><br>@Thickness 0.256 - 0.472 in | Typical Elongation |
| Modulus of Elasticity | 72.0 GPa                               | 10400 ksi                               | tensile            |

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