

Alcoa Specialty Alloys: C891F EZCastPlus™

Improved strength for lightweight in high-demanding structural applications

Weight reduction in Automotive applications is becoming a crucial topic in an industry where high strength is required to enhance lightweight. C891F EZCastPlus™ alloy is the new generation of high-strength alloys. C891F EZCastPlus™ is designed to achieve increased strength combined with good mechanical properties for high-demanding structural and lightweight applications in the Automotive industry.

C891F EZCastPlus™ is a high-pressure die casting (HPDC) alloy that can achieve superior strength performance, delivering a performance 20% higher than other competitive alloys. Improved strength enhances lightweight parts while providing optimal mechanical properties for thin-wall structures and weldable castings.

Megacasting | Battery boxes | Shock towers and tunnels
Frame Nodes | Connection nodes | Sub-frames | Engine cradles
Cross-members | Side doors | Radiator mounting | Engine mounts

Strength elevated to the next level

C891F is part of the EZCast™ alloy family. It is a high-pressure die casting (HPDC) alloy with exceptional strength that maintains optimal mechanical properties for thin-wall structures and weldable castings, enhancing further lightweight for high-demanding structural applications.

- Superior strength. Yield strength 20% higher than competitive alloys.
- Outstanding fatigue performance, improved more than 20% compared to competitive alloys.
- Excellent fluidity, suitable for HPDC.
- Good hot tearing and die soldering resistance.

C891F EZCastPlus™ Technical Data

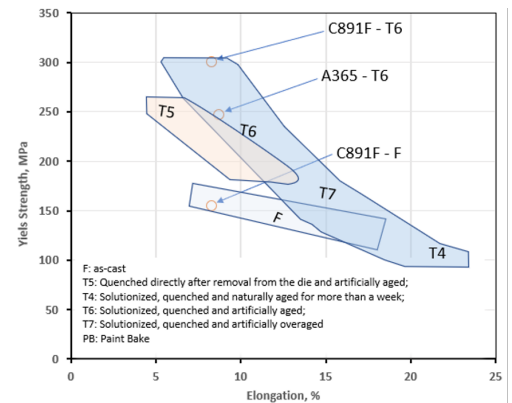
CHEMICAL COMPOSITION *(all in wt%. Single values indicate maximum content)

Si	Fe	Mn	Mg	Ti	Others
7.0-10.0	<0.2	0.4-1.0	0.2-0.7	<0.5	0.05-0.5

MECHANICAL PROPERTIES*

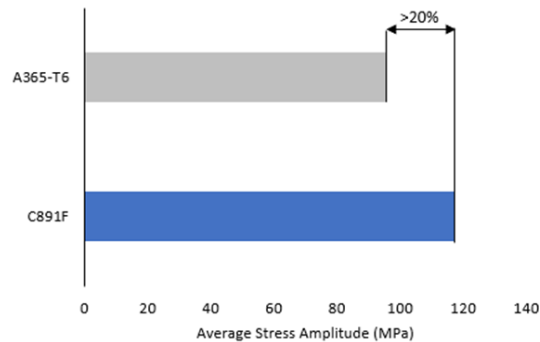
Alloy-Temper	Yield Strength (MPa)	UTS (MPa)	Elongation (%)
C891F - F	155	288	8.3
C891F - T6	300	357	8.3
A365 ¹ - T6	247	309	8.7

*The achievable mechanical properties are strongly dependent on the casting process used. The table and plot refer to typical properties obtained in thin-walled high-pressure vacuum die cast (HPDC) components. ¹A365 (AlSi10MnMg).



FATIGUE STRENGTH**

C891F EZCastPlus™ shows improved fatigue strength when compared to A365¹-T6 alloy.



**Axial fatigue samples machined in vacuum HPDC brackets with wall thickness 3mm. Testing at room temperature with R-ratio -1 operating at 50 Hz frequency for 10,000,000 cycles. ¹A365 (AlSi10MnMg).

PHYSICAL PROPERTIES (TYPICAL VALUES)

Density (g/cm ³)	Young's Modulus (GPa)	Coeff. Of Thermal Expansion (CTE) 20-300°C (µm/m/K)	Thermal Conductivity [W/(mK)]	Solidification Range (°C)
2.67	70-74	21.5	135-170	600-510

OTHER PROPERTIES

- Good weldability.
- Very good corrosion resistance and machinability.

High quality weld between C891F EZCastPlus™ cast node and 6082 extrusion tube sheet

C891F EZCastPlus™ Cast Node



6082 Extrusion Tube



To know more about the full range of Alcoa special alloys applications, scan the QR Code.

You can also use the link in your Internet browser:
<https://www.alcoa.com/global/en/what-we-do/aluminum/cast-products/foundry-aluminum-alloys.asp>