

Alcoa

Signature Stress Relieved (SSR)[™]

Forged Billet

With single digit residual stresses (ksi), Alcoa's hand forged aluminum billet can frequently be used in place of aircraft grade stretched plate. Its minimized machining distortion yields a better and more robust part than typical hand forgings.



144" x 48" x 7" SSR[™] Forged Billet replacement for Boeing commercial aircraft.



Alcoa Forgings
Building Better Solutions

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Alcoa SSR™ Forged Billet – your solution to global aircraft grade aluminum plate shortages

Through developmental and production programs with aircraft OEMs, and the utilization of large press technology (50,000 ton plus), Alcoa Forged Products can now produce open-die “hand forged” products that exhibit plate-like qualities in their residual stress characteristics.

Named SSR Forged Billet™, these new products utilize Alcoa’s proprietary Signature Stress Relief (SSR™) technology to reduce post quench residual stresses to values never before achieved in hand forged pieces. This leads to minimum machining distortion for our customers. In the past two years there have been thousands of parts successfully machined from Alcoa SSR Forged Billet with less than .5% machining fallout.

Independent corroboration of low residual stresses

Residual stress testing by an independent test house confirms longitudinal residual stress in Alcoa SSR™ Forged Billet products to be +/- 3 ksi, a very low value nearing that of stretched plate. All the products tested were produced using our Signature Stress Relief (SSR) process.

Sizes and properties

Alcoa SSR™ Forged Billet is available in rectangular shapes with the following dimensions:

- Length (L): up to 144" (3660 mm)
- Width (LT): up to 48" (1220 mm)
- Thickness (ST): from 4" to 8" (101-203 mm)

Aerospace quality and properties

7050-T7452 SSR™ Forged Billet meets aerospace standards for ultrasonic quality (ASTM-B594; AMS-STD-2154 Class A or B) and mechanical properties as follows:

Heat Treat Thickness	Specimen Orientation	Tensile Strength (ksi)	0.2% Yield Strength (ksi)	Elongation % in 4D
4-5"	L	70	60	9
	LT	69	58	4
	ST	66	54	3
5-6"	L	69	59	9
	LT	68	56	4
	ST	66	53	3
6-7"	L	68	58	9
	LT	67	56	4
	ST	65	52	3
7-8"	L	67	57	9
	LT	66	52	4
	ST	64	50	3

Fracture Toughness (Plane Strain)

4-8" L-T K_{Ic} fracture toughness minimum = 25ksi√in

Custom shape possibilities

Custom contoured, angled, and sawed SSR™ Forged Billet are also available. These hand forgings provide an amazing range of possibilities well beyond those available by direct replacement of rolled, stretched plate. Produced as needed, and quoted and ordered as necessary, Alcoa SSR™ Forged Billet in custom shapes can improve “buy-to-fly” ratios, as well as reduce heat treat section thicknesses.



Example of a large contoured hand forged product produced for the aerospace industry.

For thicker applications (up to 12")

Alcoa’s new 7085-T7452 SSR™ Hand Forged Billet is now available with improved properties for use up to 12". Call for our recent 7085 Green Letter.



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For more information, call your Alcoa Forged Products area account manager.
Or contact Sales and Marketing at 216-641-3600.