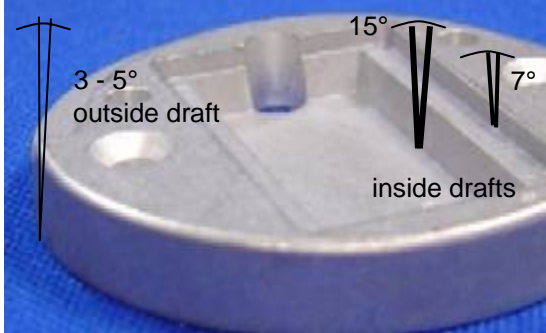
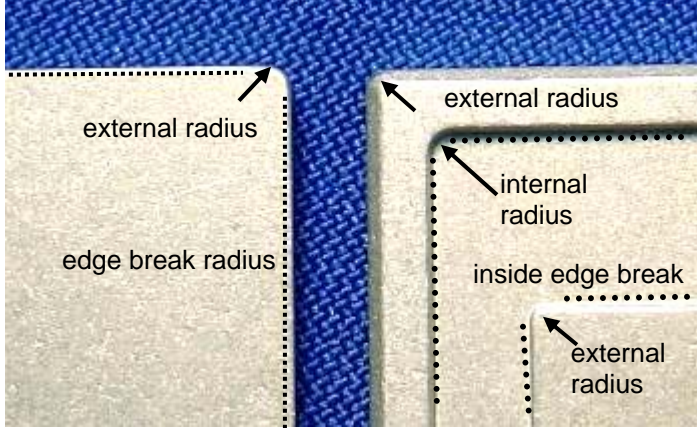
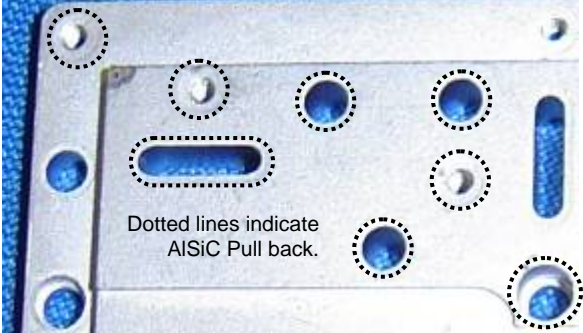
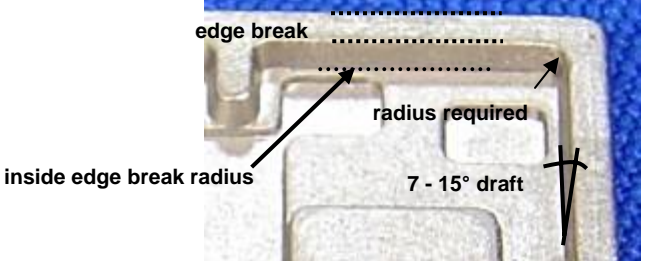
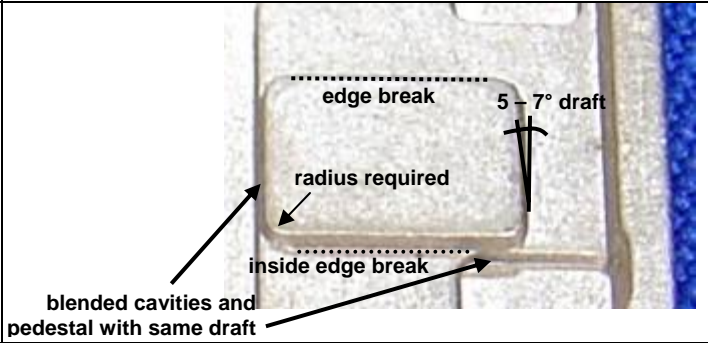
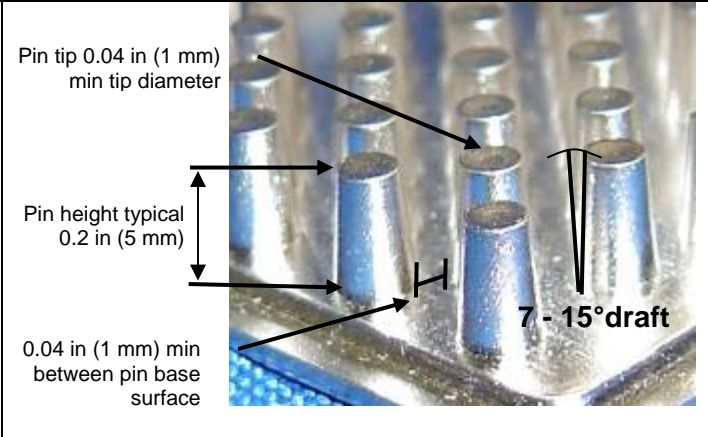
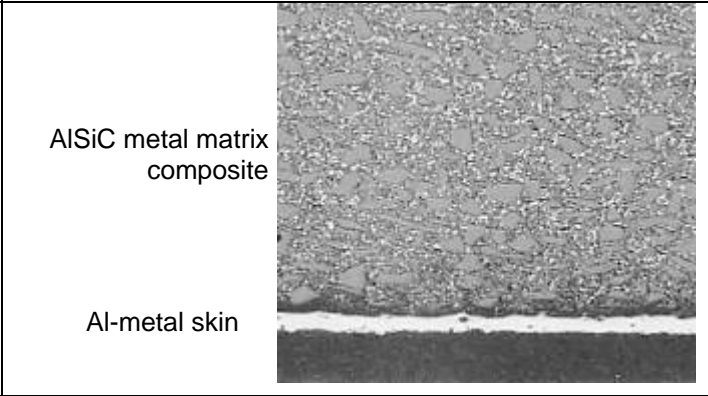


CPS AlSiC design rules quick reference

NOTE: These guidelines represent general design considerations for basic AlSiC manufacturing. Please contact CPS design engineers to discuss the most cost-effective design solution.

DESIGN FEATURE	DIAGRAM
<p>Draft Angle</p> <ul style="list-style-type: none"> - Required for casting process. - 3 – 5° outside features - 3 – 15° inside features (cavities) <p><input checked="" type="checkbox"/> Consider how drafted feature will influence final product dimensions</p>	
<p>Radius Features</p> <ul style="list-style-type: none"> - Typically all cast features of the product have corners with a minimum corner radius or edge break. - Internal feature radii min 0.010 in (0.25 mm) - External feature radii min 0.040 in (1mm) <p><input checked="" type="checkbox"/> AlSiC products are cast in CNC machined molds and therefore the corner radii are a function of end mill tip diameter as well as the radii at the bases of cavity and pedestals and draft angle addition or subtraction.</p>	
<p>Holes</p> <ul style="list-style-type: none"> - Holes and tapped holes in the AlSiC are facilitated by machining in area of only Al-metal. Typical SiC pull back from Al-rich zone is 0.015 in (0.38 mm) - 0.030 (0.76 mm) hole diameter (minimum) - Location tolerance +/- 0.003 in (0.076 mm) <p><input checked="" type="checkbox"/> Holes are typically machined after casting and there is no draft angle.</p>	
<p>Cavity Features</p> <ul style="list-style-type: none"> - Are net-shape cast in your product (no machining) - Cavity features are subject to inside draft angle and radius design requirements. <p><input checked="" type="checkbox"/> Consider how drafted feature dimension will influence final product dimensions of the cavity floor area.</p>	

CPS AISiC design rules quick reference

DESIGN FEATURE	DIAGRAM
<p>Pedestal Features</p> <ul style="list-style-type: none"> - Net-shape cast (no machining) - Pedestal features are subject to outside draft angle and radius requirements. - 0.04 in (1 mm) edge min pedestal size - +/- 0.002 in (0.05 mm) z-height tolerance. <p><input checked="" type="checkbox"/> Consider how drafted feature will influence final product dimensions of the floor area surrounding your pedestals.</p>	
<p>Pin Fin Features</p> <ul style="list-style-type: none"> - Net-shape cast (no machining) - Pin fin features are subject to outside draft angle design requirements (7 – 15°) - 0.040 in(1 mm) minimum between pin surfaces at base - 0.040 in (1 mm) minimum pin tip diameter - 0.2 in (5 mm) typical pin height - Typical z-height tolerance +/- 0.003 in (0.076 mm). <p><input checked="" type="checkbox"/> Pin fins maximize your surface area for cooling.</p>	
<p>Aluminum Skin</p> <ul style="list-style-type: none"> - The AISiC casting process uses pressure assistance to completely infiltrate a porous SiC preform to form the composite. This infiltration process also results in the formation of an Al-metal skin on product surfaces. - Skin thickness 0.0 to 0.003 in (0.08 mm) (z-dimensions). <p><input checked="" type="checkbox"/> Grinding will expose the AISiC metal matrix composite.</p>	
<p>General Cast Tolerance (Typical Values)</p> <ul style="list-style-type: none"> - +/- 0.005 inch (+/- 0.127 mm) general tolerance (x-y-z) - 0.032 inch (0.81 mm) min radius @ outside corners - 3 - 5° taper on outside vertical (z-dimension) - Flatness 0.002 in/in (0.05mm/25.4 mm) - Machined feature tolerance <+/- 0.003 inch (0.076 mm) - Finish 63 μ-inch or better (1.6 μm or better) 	