



An expert in aerospace composites and metals answers the question:

Will Shot Peening Stay Aloft?

The Boeing 787

The Boeing 787 materials listed by weight:

- 50% composite
- 20% aluminum
- 15% titanium
- 10% steel
- 5% other

The aircraft will be 80% composite by volume. Aluminum is used on wing and tail leading edges, titanium used mainly on engines and fasteners, with steel used in various places. Resource: www.wikipedia.com

Composite materials have been used in aircraft interiors for years and now they are making their way into aerospace structural components. To keep tabs on composites, we kept in touch with Derick Baisa while he was the Director of Marketing for C&D Zodiac Inc. /Northwest Composites. The overhead luggage bins in planes with which you have a love/hate relationship? C&D Zodiac has been producing them, and many other composite components, since 1987. Mr. Baisa recently left C&D Zodiac to be the Business Development Manager at AMT, a precision machining and assembly aerospace facility in Arlington, Washington.

AMT manufactures structural parts for the world's leading original equipment manufacturers and tier one suppliers such as Boeing, Airbus, Bombardier, Gulfstream, Hawker Beechcraft, Cessna, Sikorsky, Spirit AeroSystems, Triumph and Goodrich. AMT's experience and capabilities span multiple segments of an aircraft, including the engine pylon, struts, wing box, wings, vertical stabilizer, horizontal stabilizer, floor beams, wheel well and interior components. AMT has 3, 4 and 5-axis high-speed machining capabilities up to 33,000 RPMs and hard metal machining capabilities.

AMT outsources shot peening to several companies. To meet their high volume and quality control requirements, AMT placed a shot peening machine in a shot peening vendor's facility for their exclusive use.

Now Mr. Baisa is able to give us his viewpoint from both sides of the playing field and we are pleased to share our most recent conversation with you.

Shot Peener magazine (SP): Are metals and composites truly competitors?

Derick Baisa (DB):

I would say yes. Composites and metallics are competitors in the structural aerospace market. We've seen the trend shift towards more and more composite components on aerospace structures; however, there will always be a good portion of metallics in structures. Of course, we're also noticing a rise in titanium components that interface with the composite details due to the compatibility of these materials.

SP: Are composites a threat to the aerospace shot peening industry?

DB: Yes. Composites have always had a strong hold on aircraft interiors but have now made their way into structural components. Some of our metallic components have been re-designed to composite, mainly for weight savings, although we have recently

witnessed some new designs that are bucking the trend and are being redesigned from composite details to metallic for better weight savings and fatigue life. But as engineering designs evolve and include more composite materials, it will have an effect on shot peening requirements.

SP: Will shot peening still have a role in aerospace manufacturing?

DB: This is a good question. The trend in recent designs has been toward composites or other lighter weight materials such as aluminum lithium. Composites are now used in components which were traditionally metallic such as floor beams, fuselage frames, wing ribs and longerons. I think we will see good competition between these new breeds of materials in future designs.

Shot peening will continue its role in the production of metallic aerospace parts, despite the trend toward composites, because commercial aerospace is in a growth market. But even though it's growing, the commercial aerospace industry is challenged at the moment with rate increase announcements on almost every platform. These rate increases, along with Boeing's recent decision to re-engine the 737, mean that we should see the existing 737 metallic structure around for a much longer time. This work is now sustainable through the foreseeable future.

This is good news for machine shops like ours as well as shot peeners that will service this part of the market. In fact, the rate escalations for the 737 mean much more work content in the future. 737 rates are confirmed at 31.5 shipsets (ss)* per month through the end of 2011 and 35 ss/Mo. in 2012, 38 ss/Mo. in 2013 and 42 ss/Mo. in 2014. There's also talk that Boeing is looking into even higher rates of 50-60 ss/Mo. This is on top of 777 rates from 7 ss/Mo. to 8.3ss/Mo. and 747 rate increases from 1ss/Mo. to 2 ss/Mo.

787 Rates will start to escalate upward towards 10 ss/Mo., also with their first delivery scheduled for September of this year. On the other side of the Atlantic, Airbus is doing the same and their new A320neo is selling like hotcakes. They posted 600+ orders and agreements during the Paris Air Show.

AMT is in "rate readiness mode." We're querying ourselves and our vendors to prepare for the high volume of work. Wow! Aerospace is a booming market in an otherwise slow economic recovery.

SP: Thank you for your unique perspective, Derick.

**A shipset is the full complement of a part assembly required to equip and complete one specified aerospace vehicle for full operation.*



Derick Baisa is the Business Development Manager at AMT, a precision machining and assembly facility for aerospace.