

APPLICATION

Industry

- Aerospace
- Space
- Defense
- Maritime

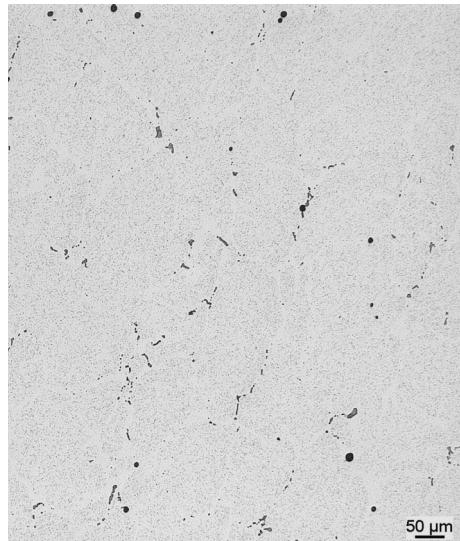
Application

- Fall pipe
- Subsea remotely operated vehicles (ROV)
- Naval weapons systems
- Commercial submarines
- Mold-making equipment
- Experimental programs
- Missile & fire control systems
- Plastic/blown film molding equipment

Result

- Enhanced corrosion resistance
- Virtually immune to stress corrosion cracking
- Exceeds 2XXX, 6XXX & 7XXX in fracture toughness & fatigue
- Maintains machinability of 2XXX & 7XXX
- Weldable
- Impervious to hot cracking

STUDY 1: MACHINING MINIMIZATION



CHALLENGE

A BETTER ALTERNATIVE

During collaborative discussions with industry experts, a recurring deficiency was noted for forged aluminum products, the need for aluminum with excellent fatigue endurance, toughness and corrosion resistance characteristics. Scot Forge worked with these experts to perform a study evaluating suitable aluminum alloy compositions capable of meeting the strict criteria for forged components used in Naval, Aerospace and Defense programs. An alloy was discovered, aluminum 6013, that when tempered is well adapted for many forging applications.

HIGHLANDER 613™ COMPARISON CHART
FOR FORGED ALUMINUM COMPONENTS

	6061-T6XX	2219-T8XX	7050-T7XX	7075-T6XX	Highlander 613™
Strength	●●○○○	●●●○○	●●●●○	●●●●●	●●●○○
Elevated Temp. Properties	●●●○○	●●●○○	●●○○○	●●○○○	●●●○○
Stress Corrosion Cracking	●●●●○	●●●○○	●●●○○	●○○○○	●●●●●
Fatigue Endurance	●●●○○	●●●○○	●●●●●	●●●●●	●●●○○
Toughness	●●●●○	●●●○○	●●●○○	●●●○○	●●●●●
Machinability	●●●○○	●●●○○	●●●○○	●●●○○	●●●○○
Weldability	ALL METHODS	ALL METHODS	FSW & EBW ONLY*	FSW & EBW ONLY*	ALL METHODS

Only possible through friction-stir welding (FSW) and electron beam welding (EBW) not through conventional means.
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DOING MORE THAN THOUGHT POSSIBLE

Scot Forge has devised a proprietary processing method for aluminum 6013 and dubbed it Highlander 613™. Originally Highlander 613™ was developed as a better alternative to the traditionally forged alloy 6061, but after reviewing and optimizing the material's forging properties, we have also found it presents substantial benefits when compared to aluminum alloys of the 7XXX and 2XXX series as an all-around versatile product.