THE ADVANCED CASTING RESEARCH CENTER – ACRC

Project Fact Sheet

FLUIDIZED BED HEAT TREATMENT OF CAST AL-SI BASED ALLOYS

BENEFITS

Fluidized bed provides rapid and uniform heating of components.

Tight temperature control

Fluidized bed heat treatment reduces solutionizing and aging time of cast Al-Si based alloys.

Microstructural benefits

- Rapid spherodization of eutectic Si
- Rapid and uniform precipitation in cast Al-Si based alloys

Fluidized bed quenching is very effective for less quench sensitive alloys such as 354 and 319 type cast alloys.

Fluidized bed quenching significantly reduces part distortion and residual stress

No secondary cleaning operation is needed to clean components

IMPACT

Potential for significant reduction in heat treating time

Energy savings

Increases precision

Reduces distortion

The effect of fluidized bed heat treatment of cast Al-Si based alloy was studied. Total time for T6 temper for cast Al-Si based alloy was reduced to less than 2 hours.

Effect of short solution heat treatment using fluidized bed (A356 Alloy)

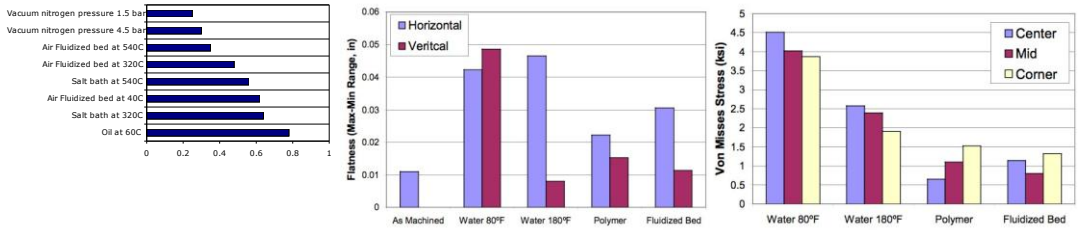
As-cast FB/solutionized at 538C for 15 min.

Ultimate Tensile Strength – T4 Temper

Allot/Temp.	UTS (Ksi)		
	As-cast	FB (time, min.)	CF (time, min.)
A356/538C	24.51	38.15 (30)	38.53 (360)
D357/543C	24.39	41.4 (30)	43.86 (360)
354/527C	29.39	40.88 (45)	40.06 (360)
319/493C	35.56	44.88 (45)	42.5 (360)

Fluidized Bed As Quenchant

Relative cooling rate Distortion Residual stress



- Fluidized bed quenching reduces residual stress and distortion
- Fluidized bed quenching is effective in less quench sensitive Al alloys, such as 319 and 345 Al alloys/

FOR MORE INFORMATION, PLEASE CONTACT:

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