shear strength of 1205 MPa (175 ksi), a stronger holding fixture with tungsten carbide inserts was needed that would not deform during testing. In general, all of the strength properties were isotropic, and the alloy exhibited outstanding ductility as measured by elongation and reduction in area.

Heat treatment

AerMet 100 Alloy parts can be heat treated by solutioning at a selected temperature of 1625°F ± 25°F (889° C) for one hour, then air cooled, vacuum cooled, or oil quenched. To obtain full properties material must reach 150°F (65°C) within two hours. After cooling, the alloy should be deep frozen at –75°C (–100°F) for one hour, air warmed, and then aged at 480°C ± 6°C (900°F ± 10°F) for five hours. Depending on requirements, hardness can be varied from 55 down to 51 HRC, with fracture toughness exceeding 135 MPa$\sqrt{m}$ (125 ksi$\sqrt{in.}$) in the lower strength condition.

Production experience

AerMet 100 has been proven by CarTech in production: 40 vacuum induction melted/vacuum arc remelted (VIM/VAR) heats of 6800 kg (15,000 lb) each have been produced in a variety of ingot sizes up to 760 mm (30 in.) round. Stock in finished inventory ranges in size between 25 and 405 mm (1 and 16 in.) double octagons. It is offered in bar, wire, strip, billet, sheet, plate, and hollow bar.

The aerospace industry is not the only one to recognize the new steel's unusual combination of mechanical properties — high strength, high toughness, resistance to stress-corrosion cracking and superior ballistic tolerance. R&D magazine named AerMet 100 as one of the 100 most significant inventions for 1991. ■

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