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Titanium Powder Metal

The launch of a new Dynamet Technology business unit highlighted powder-metal developments at Titanium 2008, the 24th annual conference and exhibition held Sept. 21-24 at Caesars Palace, Las Vegas. The International Titanium Association (Web site: www.titanium.org), Broomfield, CO, sponsors the event.

Projections by conference speakers were compiled just prior to the full realization of the unfolding global economic meltdown, which creates a considerable degree of uncertainty for all business sectors.

Industry pioneer Stanley Abkowitz of Dynamet Technology, Burlington, MA, trumpeted the "reinvention" of the workhorse Ti-6AL-4V alloy with the development of solid-state consolidation and purification (SSCP) billets composed of titanium powder and low-cost scrap feedstocks. Dynamet recently created a business unit--NuLife Titanium LLC--to commercialize the SSCP product. Utilizing isostatic pressing and vacuum treatment, Abkowitz said the SSCP material can be turned into high-quality casting feedstock as well as forging extrusion billet and rolling-plate preforms. An industry veteran, Abkowitz recalled submitting his first technical paper on titanium at a symposium held June 9-10, 1954 at Columbia University, NY.

Eric Baril of the National Research Council (NRC) of Canada discussed efforts to develop titanium foams based on a powder metallurgy approach. Potential commercial and industrial applications of foamed metal would include heat-exchange electrode filters, biomedical and dental applications, fuel cells and porous electrodes. He said the NRC foam process is similar to existing powder-metal injection molding techniques, employing a melt binder, a polymer foaming agent and a base metal powder. According to Baril, test trials have demonstrated the ability of the NCR process to control the foam's surface permeability and porosity in small-batch prototype components.

Laurenz Plochl reported on development efforts at ADL Vacuum Technologies GmbH, Hanau, Germany, on a process known as electrode induction-melt inert gas atomization (EIGA) for titanium powder. Plochl said the technique has achieved steady-state melt-flow rates of 90 kg/hr with "significantly reduced" argon gas consumption. The process offers the potential to utilize titanium alloys for vacuum arc remelting (VAR) electrode feedstock, which would offer cost advantages compared with hot-forged titanium rods.

ADMA Products Inc., Hudson, OH, touted a low-cost powder metallurgy process as a "promising route" for producing titanium alloys, which would be suitable for applications in hot- and cold-isostatic pressing, die pressing and direct-powder rolling. The process involves a "blended-element" powder metal technology, where hydrogenated titanium powder is produced via a modified Kroll process and combined with a master alloy. The company is offering commercial grades of the material in Ukraine.

In other powder-metal presentations, the U.S. Army Research Lab described its work on creating a hatch door for an armored vehicle, while Concurrent Technologies discussed the verification of low-cost pipe for Navy applications.

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