



Milwaukee Section Meeting Notice

March 2009

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Process Development and Design for Investment Casting

Sponsored by



James A. Capadona – Senior Vice President

Adam Curtis - Design Engineer

Thursday April 16, 2009

4:30 p.m. – Hartford, Wisconsin



Program Details

About Signicast -

Signicast is the proud recipient of Modern Casting's 2008 Metalcaster of the Year award. Operating five investment casting facilities and one machining and secondary operations facility in the Hartford and Milwaukee, WI, areas, Signicast has been a leader in investment casting since 1959. The company has 520 employees and serves more than 300 customers. Signicast utilizes low alloy, carbon, and stainless steels, and nickel base alloys to manufacture commercial grade investment castings across a diverse market place. With its proprietary technologies and fast cycle times, Signicast is one of the most innovative and automated commercial investment casters in the world.



Signicast History –

What started out as primarily a manufacturer of investment cast metal signs (hence the name: "Sign-I-Cast") has grown into one of the world's most innovative manufacturers of investment castings of all shapes and sizes – not to mention a wide variety of metal alloys.



Founded in 1959 in Milwaukee, Wisconsin, the investment casting company really started to take off in 1968. In 1972 they moved the company to one of its present sites, the Brown Deer Industrial Park where they built the first new Signicast plant. Eight consecutive expansions, throughout 1974 – 1990, at the Milwaukee location convinced the company they needed a new way of looking at investment casting. While customers loved the quality provided by investment casting, long lead times and high prices took some of the luster off the process. Armed with information obtained from an extensive customer survey, the management team developed and implemented a whole new investment casting philosophy based on the principles of Continuous Flow Manufacturing (CFM).

Growth at Signicast –

This new approach necessitated and led to the construction of an all-new facility in Hartford, Wisconsin, which began operations in 1993. From the very beginning, this facility was designed for expansion, and by early 1994 it was already clear that a second manufacturing module would soon be needed. A "support module" – which contained offices as well as additional fabrication space – became operational in January 1995. In late 1996, the company broke ground on a second dedicated manufacturing module in Hartford, which was completed in November 1997. Subsequent additions became operational in 2000 (Module 5 and an addition to the Support Module), and 2003 (Module 3). Module 4, the latest addition to our Hartford facility, began shipping parts in 2006. Process optimization has been a key factor to this growth.

Signicast Advantages –

This state-of-the-art investment casting manufacturing complex in Hartford, Wisconsin is the showcase for Continuous Flow Manufacturing. The entire complex – from top to bottom, one end to the other – is designed to facilitate the efficient, unbroken flow of castings.

In addition, Signicast is also committed to "Complete to Print" manufacturing capabilities. In other words, in addition to providing world class investment casting services, they also perform additional high quality operations, including machining, heat treatment, assembly, painting, finishing, and packaging, all in-house.

This means that an investment casting that typically takes others 12 weeks or longer to do, Signicast does in 5-10 days

Technical Presentation – James Capadona/Adam Curtis

Investment Cast Process Summary:

- Wax patterns, shell build, dewax and burn out, pour techniques, alloys, shell & part removal, secondary operations.

Investment Casting in the role of Rapid Product Development, prototypes and new product launches.

Technical advantages of investment castings compared to other processes.

Designing component shape for minimum wall thickness, metal flow, stress reductions, porosity and shrinkage defect reduction.

Designing components for part consolidation, fixturing, tooling and secondary operations.

Biographies –

Jim Capadona joined Signicast in 1978 as Engineering Manager, focused on product and process technology. He has served in technical capacities since then, Vice President – Engineering and recently Sr. Vice President – Quality. Besides quality systems, Jim has lead new Signicast businesses in powder coating and wax manufacturing to vertically integrate these processes. He received a Master of Science in Metallurgical Engineering from Illinois Institute of Technology, Chicago, Illinois and a Bachelor of Science in Metallurgical Engineering from Purdue University, West Lafayette, Indiana.

Adam Curtis joined Signicast in 2000 as an Estimating Engineer. His responsibilities include working with Signicast customers to develop high quality, cost effective investment castings. Adam works with a broad range of customers from Tier 1 automotive suppliers to small specialized machine shops. He provides design support to customers and potential customers in casting and finishing operations. Over the years he has successfully launched over 700 new investment cast parts. Adam received a Bachelor of Science in Industrial Engineering from Milwaukee School of Engineering, Milwaukee, Wisconsin.

Program Details:

- - - EVENT AGENDA - - -

Registration:	4:30 pm
Brief intro:	4:45 and 5:05 pm
Tours	4:55 and 5:15 pm
Dinner:	6:15 pm
Program:	7:00 – 7:45 pm
Special Tours:	8:00 - 8:30pm
(Toolmaking, Machining, Painting)	

- - - DINNER - - -

PRICES:

SAE Members / spouses:	\$20.00
Retirees:	\$15.00
Guests / Non-members:	\$25.00
Students w/ID	\$10.00

- - - MENU - - -

BUFFET MENU:

- Tenderloin Tips, Marinated Chicken with White Sauce
- Sour Cream Mashed Potatoes, Rice, Green Bean Casserole, Glazed Carrots
- Fruit Salad, Dessert Bar, Coffee

Registration:

Only pre-payments made with a **charge card** can be completed online via <http://milwaukee.sae.org>

Retirees, students and members without web access may register by phone on the SAE Registration Coordinator – Jim Ryan (262) 636-1634. Note new registration number!

[Registration deadline: Monday, April 13th, 2009 - 12:00 NOON](#)

Note: Last tour starts at 5:15p.m.

Map to:

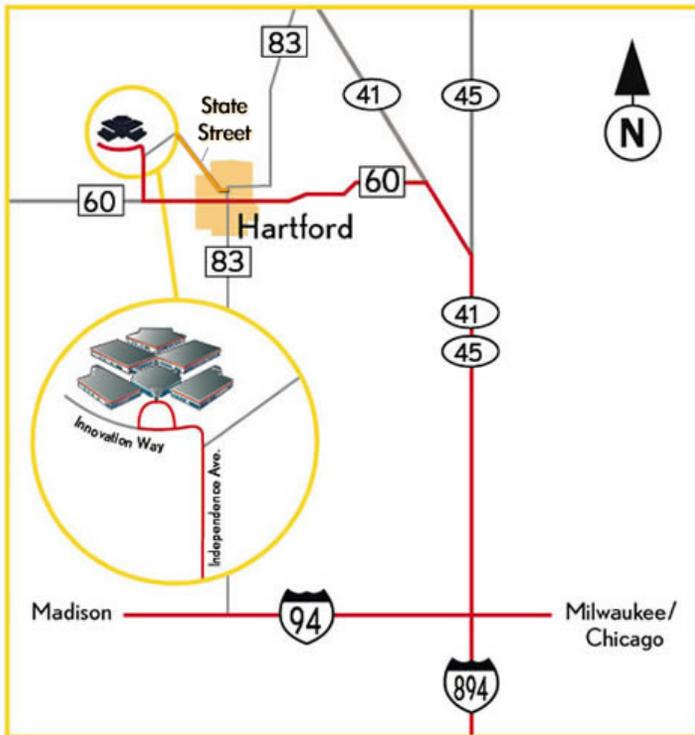
Signicast

Hartford Manufacturing Complex

1800 Innovation Way

Hartford, WI 53027

Phone: (262) 673-2700



TO HARTFORD LOCATION

From the North

(Green Bay):

Take HWY 41 South

EXIT HWY 60 West (8.3 mi)

Turn RIGHT onto INDEPENDENCE AVE (.8 mi)

Turn LEFT onto INNOVATION WAY (.4 mi)

From the South

(Chicago, Milwaukee Airport):

Take I-94 West/41 North onto I-43 South/I-894 Bypass

Merge onto I-894 West

Follow to HWY 45 North to HWY 41 North

EXIT HWY 60 West (8.3 miles)

Turn RIGHT onto INDEPENDENCE AVE (.8 miles)

Turn LEFT onto INNOVATION WAY (.4 miles)

From the West

(Madison, Minneapolis):

Take I-94 East

Merge onto 19 East

EXIT 131 toward SUN PRAIRIE (6.1 miles)

Merge onto HWY 151 North - LEFT ramp

toward COLUMBUS (15.4 miles)

Take the HWY 16 - EXIT 118 - toward HWY 60 (.3 miles)

Turn RIGHT onto HWY 16 East/HWY 60 East/W JAMES ST

Continue to follow HWY 60 East (16.8 miles)

Turn RIGHT onto HWY 60 (16.6 miles)

Turn LEFT onto INDEPENDENCE AVE. (.8 miles)

Turn LEFT onto INNOVATION WAY (.4 miles)

Why choose investment casting?

- High production rates, particularly for small or highly complex components
- Extremely good surface finish with very little machining
- Highly accurate and reliable form of casting
- **Low Initial Tooling Costs:** Tooling costs, averaged over parts produced, are often lower than other manufacturing tooling costs. Signicast builds all tools to last the program lifetime. [All Signicast tools](#) are made with 7075 T-6 aluminum versus the industry standard 6061, which is a softer and less reliable material. Signicast utilizes wear plates and gibs in the tool's slide areas for longer life, ease of repair, and greater performance. Signicast also offers [rapid prototyping](#) so customers can evaluate their component pattern before going into production.
- **Consistency:** The investment casting process at Signicast provides consistent process control and repeatability that are maintained from batch to batch.
- **Tolerance Control:** [The most accurate tolerances of any casting processes](#), over a wide variety of alloys, are achieved by investment casting. We believe that early involvement and input by our engineering staff allows customers to overcome traditional casting tolerance issues and produce a component that is 100% conformance to specifications.
- **Eliminates Material Waste:** Investment Casting is the best casting process for low scrap and waste rates. Since investment castings are cast to specifications, there is little to no machining needed.
- **Design Flexibility & Capability:** Investment casting allows you to have freedom in design flexibility for external and internal configurations. Signicast has the ability to pour [over 100 different alloys](#) so you are not bound to a limited number of alloy choices.
- **Design Enhancements:** Investment casting does not have any draft requirements like other casting processes. Logos, numbers, and letters can be cast for added features to your component. Also, gear and thread profiles can be produced with accuracies of +/- .004" per .5" of pitch.
- **Surface Finish Enhancement:** Investment castings provide you with a finer surface finish than any other casting process. Roughness (Ra), as measured by stylus instrument, will be 125 microinch maximum for parts that weigh 0.5 pound or less. Larger parts may be rougher than 125 microinch. For extra fine surface finishes, Signicast has in-house secondary finishing operations to perfect the surface finish.



REFUSE TO PARTICIPATE.

Now is the time to get stronger:

- **New product launches or design changes in a few weeks**
 - Beat your competition and capture market share.
- **Production parts in as little as 5 days**
 - Complete-to-print manufacturing without added lead time.
 - There's no need for inventory when your order can be turned around in a matter of days. No matter how big or small it is.
- **Cost reduction**
 - Converting multiple parts into a single line item? Reduce your supply base?
 - Oh, and did we say no inventory?
- **Healthy Supply Chain**
 - Diversified clientele, 50 years of continuous growth and industry leadership resulting in financial stability.

**Don't participate. Call (262) 673-2700
or visit www.signicast.com to request a quote.**

