



THE METAL CASTING MARKETPLACE OF THE FUTURE

# NETCASTER

CAST EXPO 2005 EDITION, ISSUE 11

## The Role of Castings in Armored Vehicles Helping to Save Lives in Harms Way

ENTER

**Buyers/Designers**  
of metal castings

**buyCASTINGS cuts costs and adds value**

ENTER

**Foundries**

**Reduce cost, access new markets**

ENTER

**Suppliers**

**to foundries**  
**buyCASTINGS expands markets**

### Digest



**Page 2**  
**U.S.Mfg Growth To Continue**

**Page 7**  
**What Customers Say ,**  
**buyCASTINGS.com by the Numbers,**  
**Trade Shows,**  
**2005 Growth Sectors**

**Page 8**  
**buyCASTINGS Rescues a Buyer in Need**



O'Gara-Hess & Eisenhardt of Fairfield, Ohio, an Armor Holdings Company, is one of the main suppliers of armored HumVees to the military. Metal castings play an important role in the armoring aspect of the vehicle. The standard HumVee that we might see on the streets as well as the base un-armored military model use hundreds of castings, just like most automotive vehicles. However, the additional **armoring and prep work of the vehicle for frontline activities uses a lot more critically important castings.**



**O'Gara-Hess currently armors and preps 600 HumVees per month at it's suburban Cincinnati location.**

O'Gara Up-Armored High Mobility Multi-Purpose Wheeled Vehicles (HMMWVs) such as the M1114 and its predecessor, the XM1109 (best remembered for its duty in Somalia during the early 1990's), have proven under fire that they can help troops accomplish the mission.

**As the largest and most experienced wheeled vehicle armoring company in the world,** O'Gara-Hess & Eisenhardt currently serves a wide range of commercial, corporate, government and military

customers worldwide on five continents. With peace-keeping missions on the rise throughout the world, the need for rapidly deployable forces and highly mobile, well-protected, light, tactical wheeled vehicles has never been greater.

**O'Gara engineers continuously apply new and improved technologies** to satisfy the changing needs for personnel protection needed in various campaigns around the world. What began in 1993 as a single configuration of the original AM General HMMWV chassis has become a dynamic armoring solution for a broad spectrum of task-specific vehicle variants, each designed for a wide range of modern peacekeeping missions that often require varying levels of troop protection.

### Saving lives of our soldiers

The M1116 Up-Armored HMMWV is used by the U.S. Air Force for Security Forces and Civil Engineering missions plus EOD and Base Recovery After Attack missions. This versatile armored light tactical wheeled vehicle system features **gunner protection kit, traversing turret mechanism, expanded rear compartment and added underbody M67 grenade fragmentation protection.**



A recent attack on a US vehicle is proof to the fact that O'Gara-Hess is doing its job. One of the soldiers involved reports. **"First I want to say that I am glad to be here today.** As you know my M1114 UAH vehicle was struck by an IED on 8 Sep 04, while traveling on MSR Sword south of CP45 in Baghdad. **The blast damaged the left rear quarter panel and tire, started the vehicle on fire, and caused the vehicle to swerve out of control.**

**Continued page 2: Castings Help Protect Our Soldiers**

Continued from page 1

## Castings Help Protect Our Soldiers

We then rolled over three times before coming to a rest back on all four wheels. As I have reflected over this for the past few days I am thankful for some of the safety measures that were in place that greatly contributed to our surviving this incident. **The final outcome was that all vehicle occupants received relatively minor injuries** and the vehicle was the key major loss as it continued to burn to a shell." CSM Jeff Butler, 16th MP BDE (ABN) Protector 7, Victory Camp, Iraq, **September 29, 2004.**

An important portion of the armoring and prep at O'Gara is the machine gun turret assembly. This assembly is a prime example of how metal castings are being used to help save lives and defend our nation. The assembly, pictured below, is a 20 pound device that allows the ease of movement for the HumVee mounted machine gun. With the diversity of soldiers now serving in the military, operations of equipment must be made so that 95% of all soldiers can complete the task; the machine gun turret is an example of this need. **The assembly includes 8 steel investment castings and one aluminum permanent mold casting.**



As Bob South from O'Gara states **"with increasing volumes of armored vehicles needed, it makes sense to look at castings to reduce our overall costs. Castings will be looked at to replace hog outs and welded assemblies."** For instance, the advanced versions of the vehicles will feature an aluminum casting in the floorboard area to absorb impact from under the vehicle.

Please contact Mr. Bob Dzugan at [rdzugan@buyCASTINGS.com](mailto:rdzugan@buyCASTINGS.com) or call 1-866-buyCASTINGS to learn more about the various buyCASTINGS projects as well as membership programs

## American Testing Services, Ltd.

**PH: 937-298-9390 FAX: 937-298-9429**

Nondestructive & Metallurgical Testing, Training & Equipment  
Email: [atsltd@aol.com](mailto:atsltd@aol.com) Web: [www.american-testingservices.com](http://www.american-testingservices.com)

## U.S. Manufacturing -- Growth to Continue

**2005 projections are positive as 75% of nation's purchasing executives expect revenues to exceed those of 2004.** A 7.8% net increase in overall revenues for the year compared to an increase of 8.3% for 2004. Purchasing executives expect capital expenditures to increase only 1.6% in 2005, compared to the 15.1% increase reported for 2004, which may have been driven by tax credits. Survey respondents also forecast that they will increase their purchased inventory to sales ratio this year.

**Manufacturers anticipate that employment in the sector will grow by 1.6%, while labor and benefits costs are expected to increase an average of 3.4%.** Manufacturing purchasers are predicting growth in exports and imports. They also expect the U.S. dollar to strengthen somewhat against currencies of major trading partners.

Additionally, they predict the prices they pay will increase 4.3% during the first four months of the year, and will increase an additional 0.1% for the remainder of 2005. **Respondents' major concerns are: prices and inflation; energy price increases; weak economy; effects of war and geopolitical concerns; and labor, benefits and healthcare costs, including labor shortages.**

Source: ISM Semiannual Forecast, December 2004, Institute for Supply Management

These are a series of articles on Mfg in the US - we are optimistic about the future of mfg despite all the negatives that we hear in the common media. Manufacturing in the U.S. is critical to us and we love to hear from you - how can we do better and how can we help you...call 1-866-buyCASTINGS and ask for Bob, Neil, or Lee.

## Changing the World Through Materials and Castings

**As President Bush has said, "We must begin to convert our economy from an oil-based to a hydrogen-based economy within 20 years".**

"There is historical precedent for such a culture-altering shift," says Dr. Bhakta B. Rath, ASM Vice President. "What was the conventional fuel source of the 18th century? Wood. The 19th century? Coal. But we cannot wait another century for a solution: **The liquid petroleum upon which we rely is being rapidly depleted.**" Who holds the key to finding the solution?

Metallurgist, Materials scientists and engineers. "ASM (and all of us) must take a leadership role as a society to focus on addressing this challenge, and other challenges of similar importance, before they wreck our domestic and international economy," he says.



Read the article:

<http://asm.asminternational.org/c.asp?id=549235&l=49&c=7bbdf8332cfa1267>



**CARBO**ACCUCAST™



# THE TIME FOR SAND IS RUNNING OUT.

Please visit us at the AFS  
2005 CAST EXPO  
Conference in St. Louis, Mo.  
April 16-19th  
Booth # 4920



**THE TIME FOR SAND IS RUNNING OUT.** Media selection is a key decision for competing in today's expanding global economy. The media often drives productivity, quality and economics. The performance of **CARBOACCUCAST™** ceramic media is superior to traditional casting media and provides increased casting production, precision and achievable design complexities with reduced defects, scrap and cleaning cost. Manufactured to a repeatable consistency with high availability, the products are environmentally friendly, strong and durable with reduced health concerns. Expect high recycle potential and possible reduced solid waste emissions for meeting ever-tightening MACT standards. For increased productivity, performance and value, one name stands alone, **CARBOACCUCAST™** ceramic media.

**CARBO**  
CERAMICS

CARBO Ceramics Inc. 6565 MacArthur Blvd. Suite 1050 Irving, Texas 75039 972-401-0090

[www.carboceramics.com](http://www.carboceramics.com)

© 2004 CARBO Ceramics Inc. All rights reserved.





**World Equipment & Machine Sales Co.**  
**Solon, OH 44139, U.S.A.**  
**440-519-1745, Fax: 440-519-1748**  
**[WWW.FOUNDRY-EQPT.COM](http://WWW.FOUNDRY-EQPT.COM)**

**SPECIAL IN STOCK ITEMS, READY FOR IMMEDIATE DELIVERY!!**



**PILLAR MK8 500KW**

### **MELTING FURNACES**

Inductotherm Mini Heel Holding Furnace, 500 Kw, 200 Hz, 4 Ton Steel Shell, 1995  
Inductotherm Power Supplies (3), Power Trak's, 250-10, 250 Kw, 1000 Hz ('87,'90)  
Inductotherm VIP Power Trak 125-30, 125 Kw, 3000 Hz, 1000# (1987)  
Inductotherm Water Cooling System, No. 15 Pump Package with Cooler (2001)  
Pillar Induction Furnace, Mark VIII, 500 Kw, 1000 Hz, (2) 1T Shells (2000)  
ABB Induction System for Aluminum, (2) 2200kw, (2) 4T Furnaces (1994)  
LECO Carbon/Sulfur Machine, Model CS-444 with EF400 Furnace, New 1999

### **NO BAKE SYSTEMS**



**LORAMENDI SVA**

Palmer M-300, Electric Sand Heater, Controls, (2) Pumps, Roller Loop (1995)  
Palmer M-500, Electric Sand Heater, Eagle Handler, Compaction Table, B&P  
Rollover Machine, Conveyor Loop, Transfer Sections (1995)

### **CORE MAKING MACHINERY**

Loramendi SVA Machine, 110 Ltr X 2, With All Accessories, Ready to Load (1999)  
Harrison 18 X 18 Shell Core Machine, With PLC and Sand Transporter

### **GREEN SAND EQUIPMENT**

B&P 100-B Speedmuller, Heavy Duty 250HP, Refurbished, B&P 85-B Speedmuller  
(2) B&P 100-B Spare Gear Boxes, Both Heavy Duty, One with 250HP Motor  
B&P 75-B Speedmuller, 35 – 50 Tons Per Hour, With Cooling and Batch Hopper ('90)  
HARTLEY Controller, Model 17MKII, Bond Determinator, Allen Bradley (1999)

*-Please check our web site for much more [WWW.FOUNDRY-EQPT.COM](http://WWW.FOUNDRY-EQPT.COM)*

*-Also look for our online auctions – great deals on foundry equipment  
<http://stores.ebay.com/WORLD-EQUIPMENT-AND-MACHINE-SALES>*

**FOUNDRY AUCTION SALE**  
**FORMER ASSETS OF SPARTA FOUNDRY, SPARTA, MI**  
**AUCTION DATE IS APRIL 21 AT 10:00**  
**252 E. GARDNER STREET, SPARTA, MICHIGAN U.S.A.**

CLEANING ROOM-Casting Cleaning Cells w/ FOX "Snap" Grinders, (5) Wheelabrator 28 Cu. Ft. Tumblasts; AUTO. MOLDING & SAND SYSTEMS-Disamatic 2013 MK III w/Upgraded PLC Controls, Panelmate Power Pro Touchpad, Core Setter, 3000 lb. Liquimetrics Pressure Pour Furnace w/Selcom Laser System, AMC, PMC Conveyors, Didion MD 50 Media Drum '98 and Misc. Conveyors, Simpson Model 22G Multimull w/Hartley Compactability Controls, GK Fluidized Bed Conveyor, and Misc. Belts; Disamatic 2013 MK 1, w/Upgraded PLC Controls, Panelmate Power Pro Touchpad, 3000 lb. Liquimetrics Pressure Pour Furnace w/Selcom Laser System, AMC PMC Conveyors, Didion MD 50 Media Drum '95, Misc. Conveyors, and Misc. Belts; MELTING-60" Cupola, Inductotherm 20 Ton Linemelt Channel Induction Holding Furnace, Ladle Delivery System, Ladles, Charge Crane, and Magnet; MISC. Spares, Hoists, Brown and Sharp CMM, Air Compressors, Dust Collectors, Rolling Stock and Much More!

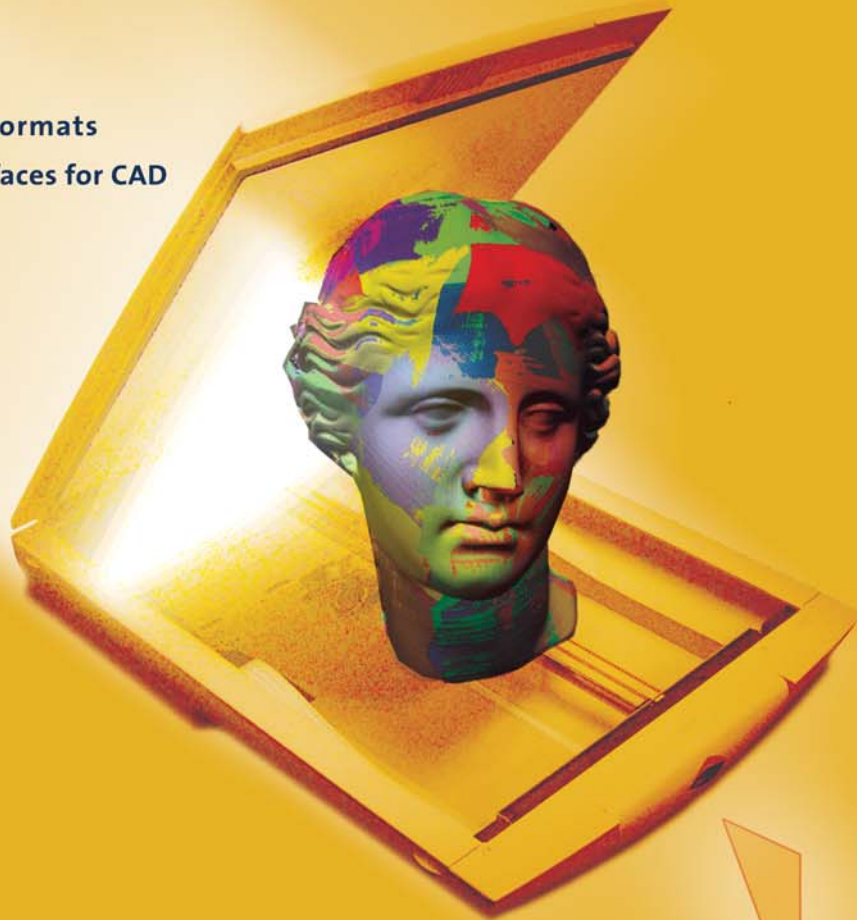
Sale Managed By:  
GoIndustry, Michael Fox International  
410-654-7500, (800) 722-3334

**NO RESERVES – EVERYTHING MUST SELL!!!!**

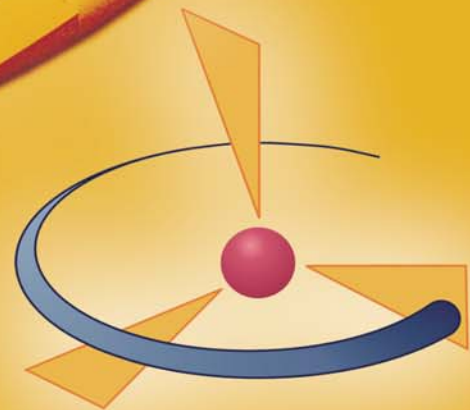
# SCANNING IN NEW DIMENSIONS

## DOES YOUR WORKFLOW REQUIRE DIGITAL DATA?

- ASCII point clouds
  - STL polygonal formats
  - NURBS surfaces for CAD



DDI's NEW EXPRESS 3D SCANNING SERVICES are just in time to accelerate your workflow. Send us your part, and we'll send you an accurate 3D digital model in just days!



**LEARN MORE: [www.directdimensions.com](http://www.directdimensions.com)**

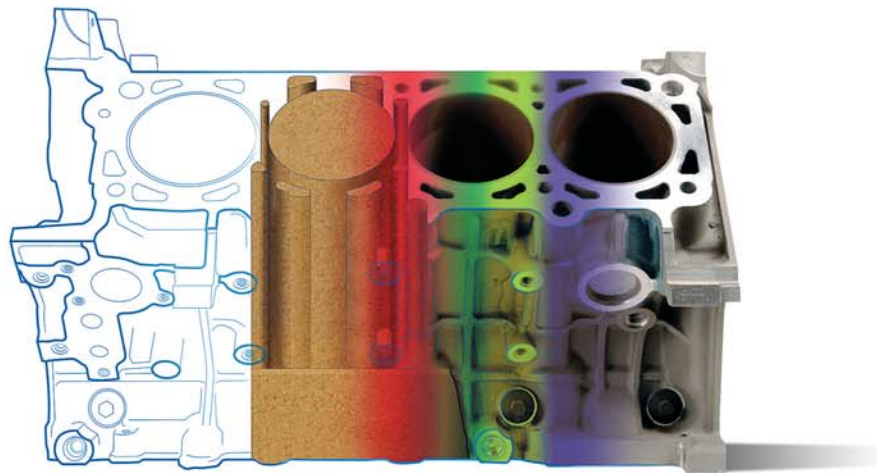
DIRECT DIMENSIONS, INC. | 410.998.0880 | FAX: 410.998.0887 | [INFO@DIRDIM.COM](mailto:INFO@DIRDIM.COM) | [WWW.DIRDIM.COM](http://WWW.DIRDIM.COM)



CASTING SOLUTIONS

DESIGN SERVICES CENTER

# “From Concept To Completion”



Who better than Ashland Casting Solutions to bring you the total package? Our Design Services team works to be your total solution from concept to completion. We have the ability to work with customers from engineered drawings through casting and testing in our design-to-manufacture process. Visit us on the web at [www.ashchem.com/ascc/castings/](http://www.ashchem.com/ascc/castings/) or contact an Ashland account manager at 1.800.848.7485.

The people of Ashland: *Delivering casting solutions one customer at a time.*

**ASHLAND**



Environmental Stewardship • Operational Excellence • Innovative Solutions • Global Team

# Simulation can improve your bottom line... and help your foundry survive.



**We all know there is less room for mistakes today. Customers expect shorter lead times, higher quality and lower cost. If they don't get these from you, they will go elsewhere.**

## **Simulation will make a difference**

**With the SOLIDCast family of simulation products, you can design your casting process to produce good parts UP FRONT. This means you will need fewer initial trials, and will be able to deliver higher-quality castings. Plus, you will be able to optimize your designs for the lowest possible cost. Simulation allows you to see the parts cast on the computer, before making production equipment or sample castings. Imagine what scrap reduction and yield improvement could do for your profitability - and for your customer!**

**Finite Solutions offers the world's most popular and easiest-to-use software for solidification modeling, flow simulation and true optimization. Plus, with our new, integrated Gating and Riser Design Wizards, initial rigging design is easier than it's ever been! Take your process design from start to finish with Finite Solutions, Inc.**

**SOLID**  **CAST**  
Solidification Modeling

**FLOW**  **CAST**  
Flow Modeling

**OPTI**  **CAST**  
Automatic Process Optimization

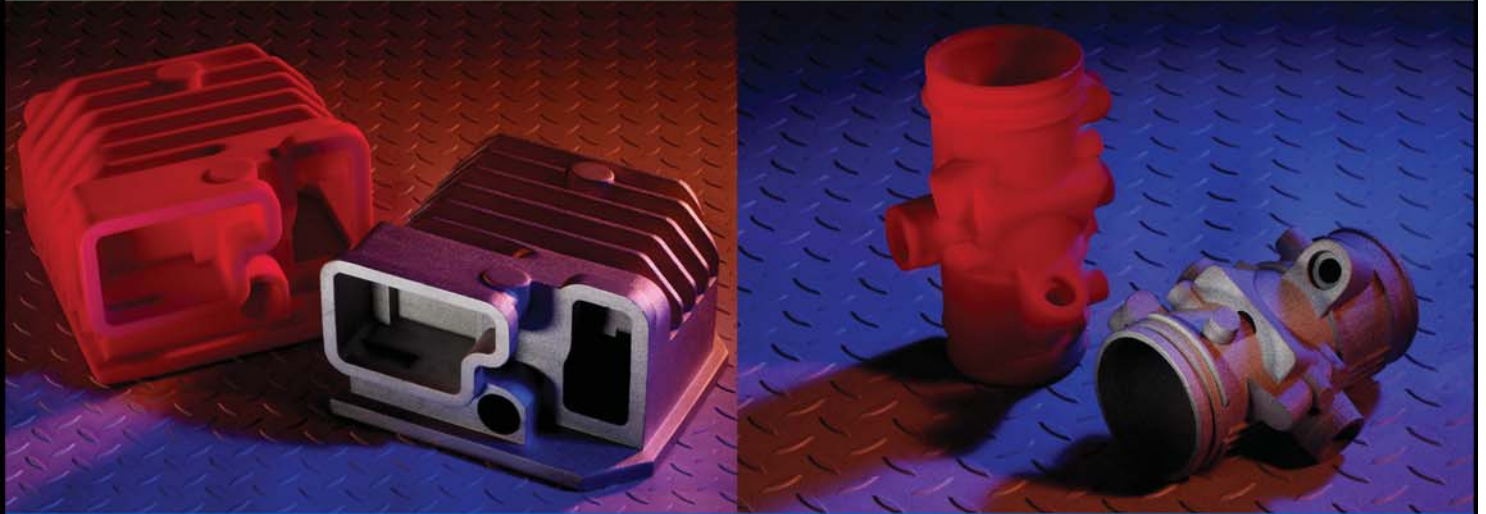


**Contact us for details: [www.finitesolutions.com](http://www.finitesolutions.com)**

Dave Schmidt Ph. 262/644-0785 Email: [dave@finitesolutions.com](mailto:dave@finitesolutions.com)  
Larry Smiley Ph. 513/821-5220 Email: [larry@finitesolutions.com](mailto:larry@finitesolutions.com)



# Need Cast Parts Fast?



**Complex Patterns & Cast Parts • No Tooling Expense • Short Lead Time**

## GT Signature Can Get You Cast Patterns & Parts in Days, Not Weeks.

Competition demands fast product development cycles. **GT Signature** helps you meet your customers' demands for parts by **creating casting patterns directly from CAD files.**

**\* NO TOOLING \* NO WAITING \***

### The SLS Process for Pattern-making

- Step One:** We take your CAD file (or your customers') and create patterns directly from polystyrene.
- Step Two:** The parts are then dipped in standard foundry wax.
- Step Three:** The patterns can then be shipped to you or cast in a variety of alloys at one of our partner foundries.

**If you don't have CAD data, GT Signature can create the files for you.**

**Contact us today for more information  
or to request a FREE quote.**

**Just call 512.491.9797 or  
email us at [info@gtsignature.com](mailto:info@gtsignature.com).**

[www.gtsignature.com](http://www.gtsignature.com)



DIGITAL DESIGN & MANUFACTURING





# EVERY CASTING HAS ITS OWN IDENTITY. FIND IT.

The best solution for casting quality and yield improvement is ProCAST. This comprehensive software validates your mold design, reducing tooling development time and enables substantial cost savings over traditional methods. ProCAST delivers unequalled capability for all alloys by providing fully coupled fluid-flow, thermal, solidification, stress, and microstructures modules with state-of-the-art micro and gas porosity models. ProCAST results from over twenty years of development and industry verification, and is backed by ESI Group, the leader in simulation based design. **ProCAST®**

*See What's Inside.*

248.203.0642  
info@esi-group-na.com  
www.esi-group.com

SEE US.  
BOOTH:  
3035 

 **ESI GROUP**  
THE VIRTUAL TRY-OUT SPACE® COMPANY



## High Performance, Hard Surface Coatings Laser-Cut 964 G4 Technology

**PROCESS:** The basic PVD Ion Sputter Plating Process (ISP) was developed by the Atomic Energy Authority of Great Britain for the application of extremely consistent ultra-thin film coatings in nuclear reactor applications. Daryl A. Blessing, using **SAC modified ISP technology**, developed the deca-elemental, single layer coating **Laser-Cut 964®** in 1993. Laser-Cut 964®, a patentable product, provides superior performance characteristics over that of other currently available single or multi-layered coatings using the conventional Evaporative Coating Process. These include coatings such as: TiN, TiCN, TiAlN, AlTiN, CrN or ZrN.

**SAC International, Inc.** is presently producing the fourth generation (G4) Laser-Cut 964®. The improvements provided broadened application range, consistency and performance. Expansion of the SAC Modified ISP process and Laser-Cut 964 G4 technology lead to the development of **Super Tin®** and **Xtend-Cut 973®** in 2001, **AlTiMAX®** and **Xtend-Wear 971®** in 2002. In our efforts for continuous improvement and value, other new coatings are on the drawing board by our R&D staff.

### Laser-Cut® Properties

Coating Process:	SAC Modified ISP
Coating Time:	11 to 14 hours
Coating Thickness:	.000065" to +/- .00002" (1.5µm +/- .5µm)
Coating Coefficient of friction:	.027
Coating Hardness Vickers:	4800
Coating Temperature:	825 ° F +/- 5 °
Coating Vacuum	10 <sup>-3</sup> Torr
Operating Temperature Range	1400 ° F constant 1800 ° F Intermittent

## DIE-CASTER RESULTS With SAC Coatings

Core Pins/Molds 4 to 8X Life Increase  
Reduced Coefficient of Friction (.027)  
Decreased Draft Angle  
Decreased Lubricant Requirements  
Decreased Porosity of Castings  
Decreased Scrap Rate to < 1%  
**Increased Quality by 98%**

**Increase tool life up to 700% \* Increase Uptime \* Increase Quality \* Increase Profits**

**(800) 964-6964**

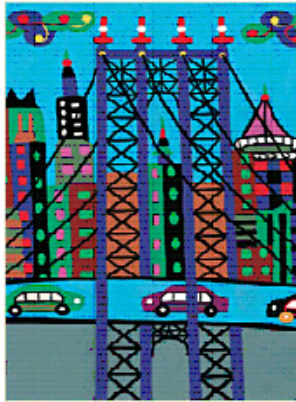
**(937) 275-5117**

**FAX (937) 278-7265**



# Don't Go Offshore Just Yet

**Sending your manufacturing overseas is one strategy, but there may be another way that can bolster profits and improve products.** In the face of intensifying competition and rising cost pressures, American manufacturers are turning to off-shoring in growing numbers. But closing US plants and transplanting manufacturing overseas may not be the best strategy, says major North American robot manufacturer, FANUC Robotics America Inc.



We must consider another option -- **automating and streamlining existing facilities.** Through this alternative, firms can increase profits and improve product quality. That's the message that Fanuc is trying to get across with its initiative "Save Your Factory.". This collaborative industry initiative is encouraging North American manufacturers to **examine the big picture and to look beyond the initial short-term investments before off-shoring.**

The decision to move overseas **needs to fully explore the product quality, factory efficiency, inventory requirements and environmental impact, governmental support and stability, supply chain strength and intellectual property protection.**

Additionally, companies should think about their social commitment and consider the motivation, loyalty, strength, skill and work ethic of their labor force.

"Save Your Factory" provides manufacturers with an objective comparison of the **advantages, real costs and impact of automating versus off-shoring.** It shows that automation, robotics and efficiency measures can be more cost-effective and profitable than off-shoring. Manufacturers can visit the initiative's site for information and to access resources, including audit and analysis tools, which can help maintain competitive manufacturing operations.

## 2005 Growth Sectors

To spot possible business opportunities for 2005 let's pay attention to the general economy AND the particular sectors:

**Residential and commercial buildings:** A slowdown in overall **consumption** is imminent as more capital is diverted to paying back debt instead of investing in capital assets as rates go up.

**Aerospace and defense:** For example, **the need for more fuel-efficient aircraft is gaining in urgency,** indicating a trend toward increased standardization of aircraft components and a shift toward smaller jets.

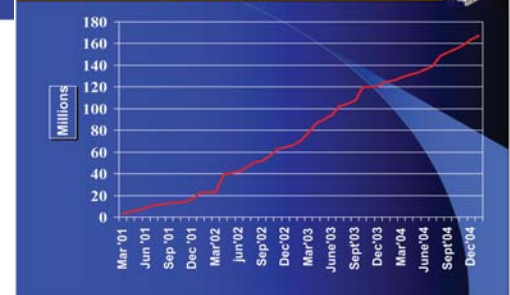
**Automotive Industry:** High gasoline prices will place more emphasis on achieving **fuel efficiency in the automotive industry.**

**Oil and gas industry:** Skyrocketing oil prices should stimulate drilling here in the **U.S. as well as in Russia, South America and Mexico.**

### buyCASTINGS by the Numbers

- 612+ Foundries Worldwide
- 1270+ Buyers Worldwide
- 300+ Suppliers to Foundry Industry
- Average 100,000 "hits" per month
- 100% Focus on the Metal Casting Industry

### Cumulative Dollar Volume of Quotes



### What our customers are saying...

"That's great, Bob. Thanks for your help. If we have other things to sell, we'll keep you and buyCASTINGS.com in mind."

— *User of buyCASTINGS.com Foundry Equipment Sales, Sacramento, Ca.*

"I appreciate your help very much...you guys are very responsive, it was phenomenal - don't expect that these days!" — *Comments from aluminum casting buyer in Cleveland*

"We look forward to working with you."  
— *Castings Buyer, Dayton, Ohio*

"Thank you for the expediency of the quotes."  
— *Buyer, Indianapolis*

"Your suggestions have been helpful".  
— *Buyer from Iowa*

"I have reviewed your entire site and think you hit it right on the button!" — *Tooling shop owner*

### VISIT US AT THESE UPCOMING TRADE SHOWS

**WE ARE ALWAYS LOOKING TO BRING NEW BUSINESS TO OUR MEMBERS**

April 3-7, 2005  
[3D Systems North America](#)  
[Stereolithography Users](#)  
Tucson, AZ

Nov. 1-4, 2005  
[Investment Casting Institute](#)  
Dearborn, Michigan

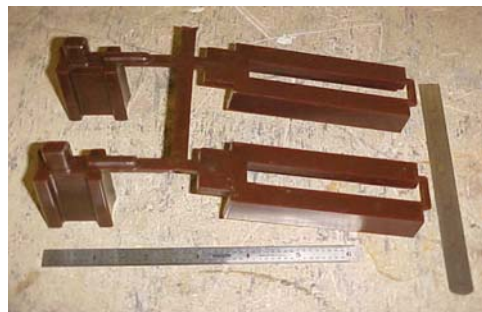
April 16-19, 2005  
[AFS/NADCA](#)  
[CastExpo '05](#)  
St. Louis, MO

Sept. 25-28, 2005  
[Materials Science & Technology 2005](#)  
Pittsburgh, Pa.

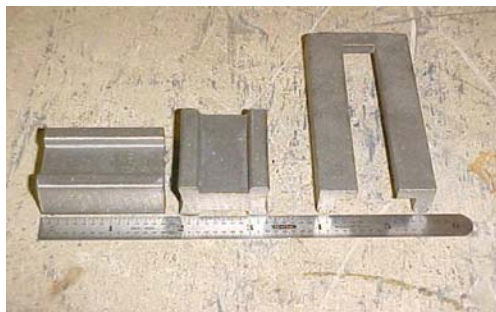
May 10-12, 2005  
[Rapid Prototyping & Manf. Conf. & Expo](#)  
Dearborn, Michigan

## buyCASTINGS Rescues a Buyer in Need

Jim Kramer at **Aker Kvaerner**, a leading global provider of engineering and construction services, technology products and integrated solutions, of Williamsport, Pa came to buyCASTINGS back in December 2004 when none of their present suppliers of casting were able to meet a compressed delivery for a new set of stainless cast parts shown below. Within 2 days buyCASTINGS identified and provided quotes from MCM Precision of Weston, Ohio as the company who could meet their needs. **Kvaerner needed 2 stainless steel castings for a boiler rebuild, but needed tooling and castings in 5 weeks.** Their present suppliers could only offer 10 and 16 weeks for delivery. "We were very pleased with the response of buyCASTINGS and MCM precision to help us at this time" said Jim Kramer.



**Wax injection tooling**



**Stainless castings for Kvaerner**

**MCM precision was able to have the automated investment casting tools built in about 10 days** and preceded to make samples that were delivered in about 3 weeks. The production of the 3200 sets was complete in 5 weeks and the remaining 3300 sets in 2 additional weeks. **"We would have never known about this opportunity without buyCASTINGS"** stated Don Marion, owner of MCM precision.

MCM delivered the complete order in less time than it would have taken their present supplier to even start shipping the first parts. **"buyCASTINGS provided us with options to help us meet our timeframe, we will use them again in the future"** as summarized by Mr. Jim Kramer, **another one of many satisfied casting buyers that come to buyCASTINGS!**

Please contact Mr. Bob Dzugan at [rdzugan@buyCASTINGS.com](mailto:rdzugan@buyCASTINGS.com) or call 1-866-buyCASTINGS to learn more about the various opportunities to get new business, cut costs, and solve your casting problem.

## buyCASTINGS Expanding Rep Network

**MARKETS:** Automotive, Aerospace, Machine Shops, Manufacturing, Medical, Electronic, Industrial, Artistic, Architectural, and Plumbing Hardware castings. **COMMISSIONS:** 2 to 6% on domestic and 5 to 10% on imported castings. **SUPPORT:** Customer leads and marketing provided through Website, industry specific trade shows, advertisement, e-mail campaigns and newsletters. **REQUIREMENTS:** engineering backgrounds desirable, knowledge in manufactured components, particularly helpful are machine shop representation or manufacturing sales. **Call: (937) 259-1316, [lmorris@buyCASTINGS.com](mailto:lmorris@buyCASTINGS.com)**



**Forms a Strategic Alliance with PROforma MCG**  
buyCASTINGS is now able to offer printing and promotional products at a discounted rate to its base of over 3000 Foundries, Buyers/Designers, and Suppliers.  
**Tradeshows Giveaways Marketing Brochures Corporate Apparel Banners and Signage Corporate Gifts Business Forms Golf Events Digital Print Business Cards Labels Over a Million Promotional Items...**  
Take Advantage of this today call 1-866-buyCASTINGS or goto [www.proformamcg.com](http://www.proformamcg.com)

**Take two weeks off**  
Z Corporation's ZCast™ direct metal casting greatly reduces traditional casting time. **Click here for more information.**

**COMMERCIAL ALLOYS**  
ALUMINUM RECYCLING SOLUTIONS  
1831 East Highland Road • Twinsburg, Ohio 44087  
toll free: 800.221.3239 • [www.aluminumscrap.com](http://www.aluminumscrap.com)

**Bodycote** HOT ISOSTATIC PRESSING  
[www.bodycote.com](http://www.bodycote.com) • (978) 470-1620

**View and Measure CAD Data**  
♦ Supports popular CAD file formats  
♦ Calculate volume, surface area and wall thickness  
♦ Inspect interior geometry  
Free full function trial available from [www.solidview.com](http://www.solidview.com) or call 1-888-SOLIDVU (888-765-4388) for a free CD

**FOUNDRY EQUIPMENT FOR SALE** Call 1-866-289-2278 or  
<http://www.buycastings.com/equipment/>

**buyCASTINGS.com**  
3155 Research Blvd. #103  
Dayton, Ohio 45420.

PRSR STD  
U.S. Postage  
PAID  
Dayton, Ohio  
Permit No. 966