Your One Stop Source for All Metal Castings

NETCASTER

AFS METALCASTING CONGRESS EDITION, Spring 2007

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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

Alternative Energy

Future of America and the Future For the Casting Industry

Casting requests are coming from the fuel cell industry, wind-mill expansion, new motor development, new power generation methods, heat energies and transfers, solar energy systems, even more efficient lighting technologies - **all new markets for metal castings!**

The United States must reduce dependence on foreign oil for its primary source of energy. The President of the United States has made it a high priority to develop and deploy advanced technologies for nurturing sources of alternative energy. **In light of the environmental and security issues with oil, let's look at our energy options and then some examples of how we, the casting industry might play a role in the energy industry of the future:**

SOLAR: Photovoltaic (PV) or photocells offer an enormous potential for the generation of clean energy on-site where the power is needed. **PV industry could provide half of the world's electricity by 2050. The other half could come from wind, waves, biomass and other sources.** This goal will be achieved assuming that an **annual growth rate of 23% per year in the PV industry over the past 15 years** continues.

GEOTHERMAL: An 18-member panel led by MIT recently released a 400-page study, titled "The Future of Geothermal Energy" (PDF, 14.1 MB). Sponsored by the U.S. Department of Energy, it is the first study in some 30 years to take a new look at geothermal system (EGS) technology which has been mostly ignored so far, for its potential of larger-scale deployment. EGS or heat mining has the potential to supply a significant amount of the country's electricity. **Unlike conventional fossil-fuel power plants that burn coal, natural gas or oil, no fuel would be required. And unlike wind and solar systems, a geothermal plant works night and day, offering a non-interruptible source of electric power. According to experts** "…energy capture and extraction is contained entirely underground, and the surface equipment needed for conversion to electricity is relatively compact." The drilling must reach depths of 5,000 feet or more. Still, "the possibility of drilling into these rocks, fracturing them and pumping water in to produce steam has already been shown to be feasible."

FUSION: Fusion power holds unlimited potential as a clean source of energy, one that does not produce radioactive waste as the current nuclear technology does. Fusion is the process that the sun uses to produce energy. buyCASTINGS wrote the winning proposal and built the team that is now in production of the 12,000 lb complex shaped steel castings that are currently being assembled to produce the fusion reactor. Details of this project were covered in buyCASTINGS Newsletters (Issue 6, Spring/Summer 2003 and Issue 9, 2004 which are available at buyCASTINGS.com.) Shown here are some examples of castings produced by the buyCASTINGS project team:

We have seen a **flurry of activity in energy related casting applications** including: Fuel cells, solar, heat transfer applications, reclamation of lost mechanical energy in power generation, precision self sustaining engine applications, windmills, engine applications eliminating part ware.

Continued on page 7

THOSE CRAZY METAL PRICES...

What's next - some predictions for 2007-2010

The world metals prices increased by 56% in 2006 mostly due to a spike in copper, zinc, and nickel. As a group, world prices of aluminum, copper, zinc, lead, nickel and tin closed 2006 some **200% higher than the average in the cyclical low-pricing year of 2001**.

First the good news…According to the market experts, as the decade progresses, **chronic shortages are NOT expected for any manufacturing raw materials**. As far as supply goes, the earth has abundant sources of manufacturing metals—for example, aluminum accounts for 8%+ of the earth's crust while iron ore is 5%. The resource base for many metals could, therefore, last hundreds of years; however, **prices are high because only a fraction of these supplies can be extracted profitably using the current technology**. But, if recycling kicks into high gear worldwide, prices could come down since these metals are not destroyed when used.

Global inventories remain at historic lows, while the new capacity has been delayed because of high energy and equipment costs and labor shortages. A surge in speculators has come hand in hand with the tightening of market supplies. Looking ahead, despite an expected capacity increase this year**, the tight market situation will probably continue through 2008, until enough new capacity comes online**.

The million dollar question is whether the recent run-up in prices will last. A recent study by IMF analysts suggest that the current high prices may not be sustained through 2010. The IM economist Sommer projects that "over the next five years, the futures prices of metals will retain only about one-half of the increase accumulated since 2002 (in real terms, metals prices fall by 45% percent from current levels)." Of course, there are differences within the group of metals—for example, aluminum futures prices are seen declining less over time (by 31%) than copper futures prices (49%).

During 2002–2005, China contributed almost all of the increase in the world consumption of nickel and tin. In the cases of lead and zinc, China's contribution even exceeded net world consumption growth. **For aluminum, copper and steel, the contribution of China to world consumption growth was about 50%.**

In Summary

- Metals prices will remain volatile
- Demand showing no signs of a major drop-off or the "r-word"
- "Buy America" complicates markets – it's not always clear what's bought where
- China & India will set the demand trend for world metals
- Supply worries aren't expected to lead to chronic shortages in any base metals
- Steel trading could be a factor – 2010 may look a lot different

Stress, Productivity, and Health…

Did you know…The American Institute of Stress and the Centers for Disease Control have both reported that up to **90 percent of all illnesses are due to stress?** It used to be that getting a job you love was the endgame for avoiding work stress. But the truth is that every job, paid or unpaid, has elements of stress. Whether it is responsibility without authority, presentations or power struggles, too much to do, personality clashes, or **working leaner and meaner,** the workplace is a fertile breeding ground for stress. Big issues and small issues, alike, momentary blow-ups or festering unspoken tensions — all can cause on-the-job stress, which can build and build and build…

As far as productivity, some level of stress is healthy in order to push and motivate and get things done. However, a higher level of stress is also bad for business, affecting morale and motivation, and potentially leading to increased absenteeism — which **hurts productivity and ultimately the bottom line.**

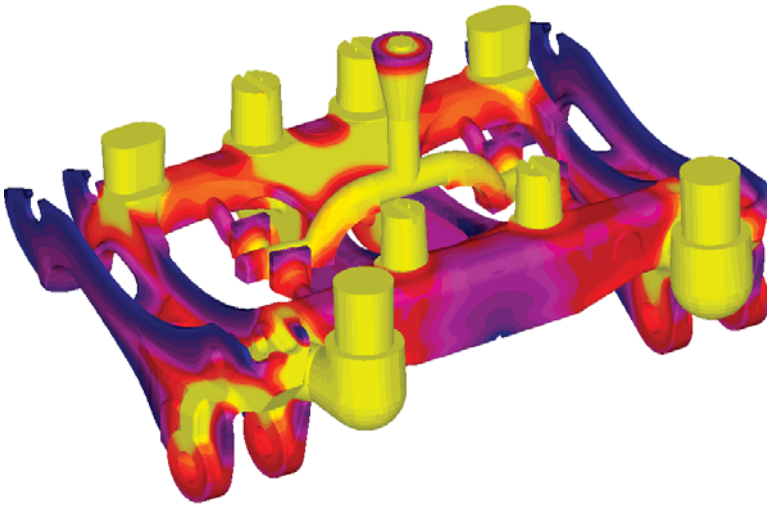
Stress is part of life - "no stress" is when you are dead. So some stress is perfectly normal. It's the long-term, unmanageable stress that can cause harm to a person's health and hurt businesses. **Most people underestimate the long-term, unmanageable stress, so here are some ways to manage stress:**

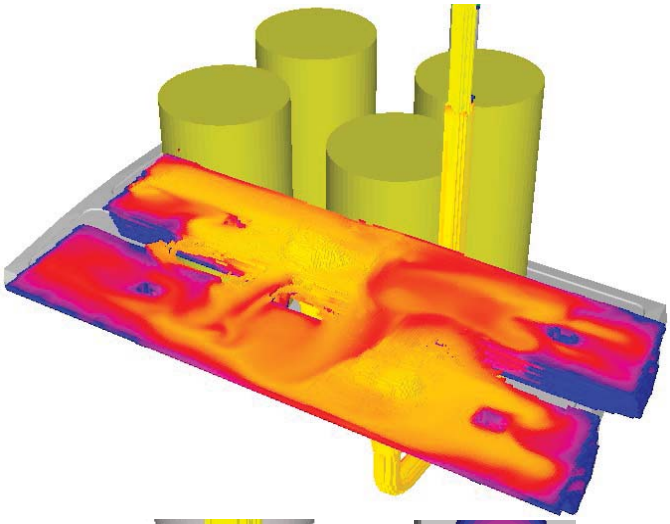
1) Identify where your stress is coming from
2) Recognize what you can and cannot change
3) Drop those unrealistic expectations
4) Think positively
5) Learn time management techniques
6) Take a break
7) Be social, but not too social
8) Eliminate distractions
9) Exercise
10) Learn relaxation techniques (meditate)
11) Get help (medicate)

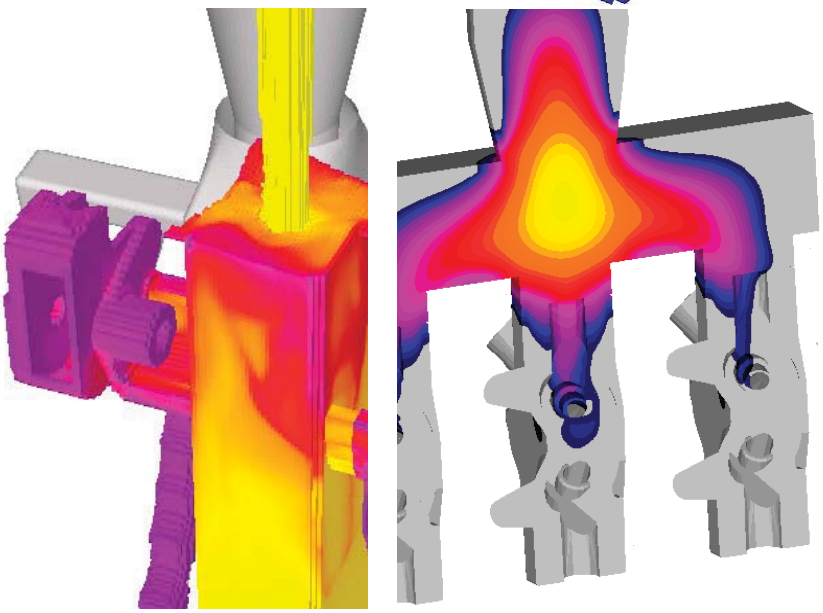
***Bottom line:* take control.**

The cause, in many ways is self-generated: the inability to "switch it off" or to forget about work after hours. If you are sleeping with your Blackberry or cell phone and compulsively checking your work e-mail from home after business hours then you are NOT in control. **Unfortunately, much of this was started by bosses who use "global competitiveness" as an excuse to keep their employees on the job 24/7.** The truth is that burnout is bad for the business and for the person. Experts say that "psychological detachment" is associated with less fatigue, more positive mood and fewer days off work. **So, turn off your PDAs, your laptops, your cell phones once in a while — just to prove to yourself who is in control.**

Enhance more than just your productivity







Casting simulation software from Finite Solutions, Inc. will greatly improve your foundry's productivity. But you'll also find that **quality**, **lead times**, **yield** and, most importantly, **profitability** will improve.

Tools such as the **Riser Design Wizard®** and the **Gating Design Wizard** ® help you gate and riser castings correctly, the first time through. Full simulation tools like **FLOWCast©** for flow simulation, **SOLIDCast©** for solidification simulation and **OPTICast©** for true automated yield optimization allow you to fine-tune designs for minimum cost and maximum quality before any patterns, molds or production castings are made.

Whether your process involves sand, investment, or permanent mold, for all ferrous and non-ferrous alloys **SOLIDCast©** is the natural choice for design and simulation.

Finite Solutions software:

- User-friendly
- Fast
- Accurate
- Cost effective

That's what makes ours the most popular PC-based casting simulation system in the world.

Visit us at the 111th Metalcasting Congress in Houston, Booth No. 111

www.finitesolutions.com.

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Finite Solutions Incorporated

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Helping Customers Harness The Performance Benefits of Advanced Materials And Bring New Products To Market Quickly

NCC's economic development model, incubation services and ability to commercialize new products quickly on a true manufacturing scale has earned it national and international recognition as ***the*** center of excellence for the development and commercialization of cost competitive composite materials and manufacturing processes for the aerospace, defense, ground transportation, commercial and infrastructure markets.

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Innovation

Collaboration

Education

Individual Growth

Business Growth

CAPABILITIES & SERVICES

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NCC is a comprehensive resource for a broad range of composite technologies including Design Optimization, Rapid Fiber Preforming, Large Scale Preforming (LSP), Closed Molding, Long Fiber Reinforced Thermoplastics (LFT), Nano Technology, Litecast® and new molding methods like Quickstep.

Quick Commercialization & Manufacturing Acceleration

NCC provides critical engineering and consulting expertise to help customers take parts from concept to factory ready products. In addition to design optimization for composites, NCC provides testing and trouble shooting of composites structures, state-sponsored scale-up of processes, prototyping, product testing and training of personnel once new manufacturing equipment and techniques are established.

Testing

NCC's Materials Testing Laboratory is equipped to meet mechanical, optical and thermal composite testing needs. The Test Lab allows companies to conduct preliminary evaluation of new materials and designs prior to substantial investment in certified testing.

Incubation

NCC offers an incubation program divided into four levels that provides facility, business, technology and capital support to manufacturers with promising advanced materials technologies through its headquarters facility or its' Dayton Campus for Advanced Materials Technologies (DC-AMT).

Membership

NCC has established a dynamic membership program broken into three categories—basic, partner and benefactor.

2000 Composite Drive
Dayton, OH 45420

Phone: 937-297-9443
Fax: 937-297-9440

1ST OHIO SUMMIT ON SUPPLY CHAIN OPPORTUNITIES IN ALTERNATIVE ENERGY

June 19-20, 2007

Location: National Composite Center
2000 Composite Drive
Kettering, Ohio 45420

MORE INFORMATION AND REGISTRATION: www.emtec.org

***Summit Vision** – Ohio provides a rich web of manufacturing expertise eager to address the burgeoning global demand for energy. The objectives of this meeting are to:*

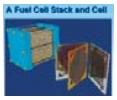
1. Describe, compare and contrast the various energy technologies that can provide alternatives to conventional fossil fuel conversion processes;
2. Identify opportunities for manufacturing and service providers to become part of the supply chain for these energy alternatives; and
3. Provide networking opportunities among developers, implementers and would-be suppliers.

These objectives will be facilitated with podium presentations, table top exhibits and posters. The intent is to stimulate and facilitate Ohio enterprises to become part of the global supply chain in this set of emerging technologies.

Exhibitors!

Speakers!

Posters!

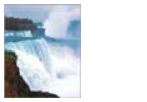


Tuesday, June 19, 2007

7:30 – 9:00	Registration and Exhibitor/Poster set-up – Continental Breakfast
9:00	- Keynote Address: Mark Shanahan Ph.D., Energy Advisor to the Governor
	- Technologies: Robert Thompson, EMTEC
	- Focusing Alternative Energy in Ohio: Bill Spratley, Green Energy Ohio
10:15 - 1200	Session 1: Clean Energy Alternatives from Hydrocarbon Sources
12:00	Luncheon (exhibits/posters open)
12:45 - 2:45	Session 2: Wind and Hydro Energy Alternatives
2:45	Break (exhibits/posters open)
3:15 - 5:15	Session 3: Solar Energy Alternatives
5:15 -	Exhibitor/Poster Session (Wine and Refreshments)

Wednesday, June 20, 2007

7:15 – 8:30:	Continental Breakfast (exhibits/posters open)
8:30 - 10:30	Session 4: Alternative Energy from Biomass and Refuse Derived Fuels
10:30	Break (exhibits/posters open)
10:45 - 12:15	Session 5: Fuel Cells/Hydrogen
12:15	Box Lunch / Tear-Down / Adjourn



Reasons to Attend:
- Learn about Ohio's energy alternatives from subject matter experts
- See the full range of new energy technologies in a compact presentation format
- Network with those who are/seek to become part of Ohio's alternative energy supply chain
- Introduce your organization with an exhibit or poster

Sponsorship Opportunities!

www.emtec.org
(937) 235-0035

Networking!

Sponsors to date:

Alternative Energy Con't – New Markets and Casting Examples

Parts are high precision, quantities range from several hundred large parts to many tens of thousands of parts of the smaller sizes. However, most of the buyers for this technology are from Europe, Japan, and the Baltic. Unfortunately, the US is still clutching the old technology of consumption, while other countries are embracing new forms of energy generation.

As part of commercial and government programs to develop alternative energy sources and the manufacturing capabilities, **"US foundries really have a great opportunity to impact our future and help build technologies that can meet all of our energy needs", says Mr. Neil Chaudhry, COO, buyCASTINGS.com Inc.** By using buyCASTINGS assembled team of experts to model, optimize process, manage the project, and coordinate all suppliers activities, tasks, schedules and budgets, there are tremendous cost savings benefits to the buyers and sponsors of such projects. The exact nature of our buyer projects and the exact dollar amounts of potential savings for each project are kept proprietary. **Call Dave Rauen, the Casting Project Manager at 937-424-4778 if you would like to build a project team for your innovative energy and casting projects.**

Hitchhiker's Guide to the Rapid Prototyping/ Metal Casting Universe

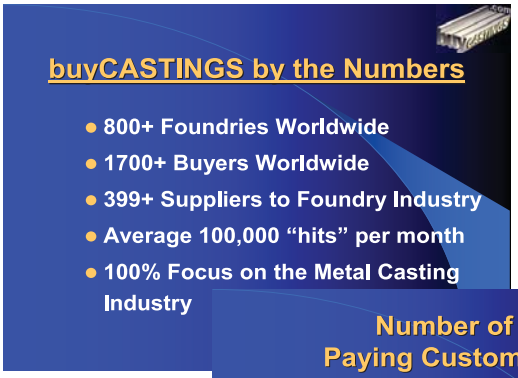
On March 21, 2007, buyCASTINGS' president Bob Dzugan made the titled presentation to **the International 3D Stereolithography Users Group (3D SUG) in Daytona, Florida.**

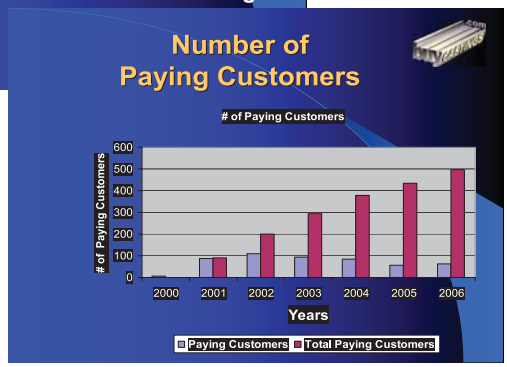
Bob has been involved in the 3D SUG conference since 1995 and has made many presentations in the past. In addition, Bob has worked with many of the companies involved in the Rapid Prototyping community to assist them with procurement of castings using the best prototype and casting combination for given applications.

The presentation that was given to the full conference entailed a look at what types of prototyping processes should be used for specific applications. The process for selecting the correct prototyping process starts with a somewhat different approach, looking at what metal is needed and beginning the down-select from there. **Bob stated:** ***"It's the same process we use at buyCASTINGS to determine what casting process and foundry we want to go to. We always start with the metal needed."*** When you start with the metal needed you automatically eliminate several processes and foundries that you can work with on the project.

The presentation included weighing factors such as quantity, complexity, cost and rapid prototyping process including Stereolithography (SLA), Quickcast, Selective Laser Sintering (SLS), ThermoJet (TJ) as well as ProMetal and FOPAT. FOPAT is a new investment casting pattern material replacing wax patterns and can be used in the prototyping process or limited production runs when more than a few castings are needed.

If you have any questions about the presentation or would like a copy, please email Bob Dzugan at rdzugan@buyCASTINGS.com





What our customers are saying…

Thanks for all your help!
Aerospace buyer in Florida

Thanks for your efforts...love the results!
Buyer in Canada

Thank you for quick response.
Buyer in Israel

"Great job!!!!"
Casting buyer in Ohio

You guys have been very helpful. I plan to continue using you in the future. I appreciate the follow-up. Thanks
Machine Shop in Ohio

"You guys are amazing"
Commercial Product Manager, California

"Thank you for your response! It looks very good to me"
A Florida Product Development Company

"Thanks again for your work on this. FYI, it would compare favorably with what could be got out of Europe so there is no refinement of the proposal required – it's good."
Buyer of Castings in Texas

VISIT US AT THESE UPCOMING TRADE SHOWS

May 1 - 3, 2007
SME Rapid Conference & Expo
Detroit, MI.

May 15 - 18, 2007
AFS Casting Congress
Houstin, Texas

October 13 - 17, 2007
Investment Casting Institute Technical Conference & Expo
Cleveland, Ohio

December 3 - 6, 2007
Defense Manufacturing Conference
Las Vegas, NV

December 11 13, 2007
PowerGen International
New Orleans, LA

March, 2008
3D Systems North America Stereolithography Users Group
TBD

Castings in Up-Armored HumVees

buyCASTINGS Helps Buyer Meet Fast Delivery Schedule

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 Iraqi 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.**

During a recent run up in production, Armor Holdings made a strategic decision to dual source its castings. LT Enterprises, a highly experienced supplier to Armor Holdings, was tasked to get the second source ramped-up and running very quickly. At LT's request, buyCASTINGS needed to find a qualified and competent investment castings source that could quickly come on-board to produce the tooling and parts. **buyCASTINGS located the foundry and within 2 weeks, the tooling and samples were completed and hand delivered; and within a month, production was underway on the 6 parts.** An Armor Holdings executive was quoted as saying **"I'm pleasantly surprised that we had a dot-com (buyCASTINGS.com) bail us out in a difficult situation.**" Presently the increased production of the machine gun turret is back on schedule after receiving castings from the dual-source foundry.

Armor Holdings **currently armors and preps 1000 HumVees per month at it suburban Cincinnati location.** Armor Holdings Up-Armored High Mobility Multi-Purpose Wheeled Vehicles (HMMWVs) such as the M1114. An important portion of the armoring and prep at Armor Holdings 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 here, 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.**

Please contact Mr. Bob Dzugan at rdzugan@buyCASTINGS.com or call 1-866-buyCASTINGS to learn more about the various buyCASTINGS projects and how you can get involved as a foundry, as a buyer, or as a rep.

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