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Excerpts of Detailed Findings of OEM Sourcing by the North American Die Casting Assn.

# The Hidden Costs of Sourcing Custom Die Cast Parts Offshore

Drawn by the promise of low prices, many North American OEM buyers and engineers have chosen to consider offshore custom manufacturing sources for die castings. Many of them have encountered unforeseen problems: The transoceanic pipeline can be very long and filled with unexpected—and costly—twists and turns. This study found that most OEMs who have purchased die castings overseas have at least one horror story to relate. The NADCA\* findings presented here are true stories.

**A West Coast manufacturer** of a computer printer retooled a large die cast substructure in Asia a year before it planned to put the product on the market. The unit price quoted was 50 percent lower than a domestic supplier's quotation.

Problems with the die casting die and the initial casting resulted in a 12-month delay. When the Asian tooling was finally approved, new prices were quoted for the die casting production—42 percent higher than the agreed-upon figure.

After adding in all of the built-in costs of doing business overseas, the company said its costs exceeded what they would have been domestically.

## Top 7 Added Costs of Offshore Sourcing of Die Castings

### 1. Market Share at Risk

You may create a new competitor for your product. The competing product can be developed using your marketing information, specifications, and even tooling.

### 2. Technology at Risk

It's dangerous to reveal proprietary technology to an offshore supplier. You may find your technology shared with your competitors—at home or abroad.

### 3. Miscommunication

Extra costs must be built in to the process of communicating die casting die design changes and assuring their proper implementation, to overcome barriers of language, distance, and culture.

### 4. Long Lead Times

Long offshore production lead times and delays are common. If a company's crystal ball is cloudy and product demand soars or drops,

commitments to overseas suppliers can't be easily altered. Short-term cancellations are often impossible.

### 5. The Price of Die Failure

Low die costs may be based on uncertified, untreated die steel, with no guarantees of tooling life—foreshadowing the heavy costs of premature die failure.

### 6. Legal Liabilities

The use of uncertified, off-spec alloy often contributes to the low prices offered by offshore die casters. This factor can be a time bomb for manufacturers, leading to a high risk of product failures when such components are incorporated in products.

### 7. Payment Sight Unseen

Because of advance payment requirements—no ifs, ands, or buts—you have no right to review shipment quality or quantity before cash changes hands.

**A producer of power saws** and snow blowers in the Southeast aggressively sought out a "less expensive" overseas supplier. Then he discovered inferior tooling—trouble with

design and workmanship that required extensive welding on die cores and other major tooling repairs.

The overseas business arrangement looked

\*For a bound copy of the publication, "Hidden Costs of Offshore Sourcing," contact the North American Die Casting Association, 241 Holbrook Dr., Wheeling, Illinois 60090, Phone: 847-279-0001

"cheaper at the front end," but management is now seriously concerned with how long the dies will last. "It's difficult to put a number on what we will have gained, if anything, in the long run," the company's purchasing agent said, adding that management is not optimistic.

### A Midwestern small appliance OEM

was attracted to the shorter tool manufacturing time offered by offshore die casting tool-makers and rushed to gain an advantage over competitors. "In our highly competitive business, timely entry of new products is imperative if we want to remain a leader in the industry," a manager pointed out.

However, as is common in production of new components, design changes were necessary. Difficulties in communicating the revisions to the overseas supplier resulted in delays that wiped out the initial saving in lead-time. The purchasing agent does not believe the company saved money in this venture, and he is sure it did not save time.

### Case of the defective door handles,

an unusual refrigerator tale. The failure of this particular zinc die cast handle is the basis of a lawsuit filed by a manufacturer of restaurant kitchen equipment against its domestic hardware supplier. The door handles, cast in Taiwan, "pulled right off the units" and were designed in such a way that the defective handles could not be replaced. The entire door had to be replaced instead. The OEM sued its hardware vendor because it would not cover the cost of the door handles and the additional expense of replacing the doors. The vendor sees itself as a victim, unable to recoup its losses from the overseas die caster who produced the defective part. All relationships have been severed, and it appeared no one would end up a winner.

### Total Vigilance is the Watchword

These stories illustrate some of the potential hidden costs of offshore sourcing.

But there can be even more serious risks involving offshore sources for die cast tooling—to the point of helping create a new, direct competitor with an unfair cost advantage.

While working with an offshore source for

a component or subassembly, the OEM provides both marketing intelligence and detailed engineering specifications about the piece part and the subassembly or finished product. Unless trust is assured and total vigilance is exercised, results can be more than upsetting:

- The offshore firm sees the production numbers and can conclude there is sufficient volume to justify copying the product for sale in overseas markets. The cost, at the very least, is the potential loss of market share for the North American firm in a foreign market.

- The offshore firm can consider entering the North American market as a competitor; using the North American company's engineering to build duplicates of the tooling.

- The offshore firm can enter the North American market with off-price knockoffs of the North American product. Even the most sophisticated firms have suffered from this outcome, with the identical name for the product and copied packaging. Former U.S. Commerce Secretary Donald L. Evans remarked to U.S. companies: "Offshore manufacturers have copied Toro's designs and produced knockoffs that differed only by addition of a K before the word Toro."

- In a worst-case scenario, the offshore company, or their affiliate, may decide to market a product making direct stealth use of the North American company's tooling. This could involve a die casting die set or all of the tooling used to produce the components in the subassembly or finished products.

### Getting the Facts

An extensive survey of North American companies—including in-depth interviews with purchasing managers—indicates that many unforeseen outcomes can become serious problems when less than fully informed decisions are made to purchase from offshore producers

The OEM interviews conducted had a recurring theme—offshore sourcing can be a breeding ground for added costs. Buyers who focused only on price quotations were deceiving themselves, experienced managers say. They were ignoring the complications of implementing design changes across time, space, and cultural differences. They were

forgetting the inflexibility of international finance or the after-effects of delayed delivery or miscommunications. They may have ignored the ambiguities of Public Law 98-39 (part of the Trade Agreements Act of 1979), which assesses additional custom costs when a U.S. company "assists" an offshore tool-maker.

In response to these problems, some North American companies have reversed course and are now working only with domestic suppliers. One U.S. bicycle manufacturer, for example, rejects Asian suppliers so that its technological breakthroughs will stay at home. "Once an overseas supplier had our business, he would use the technology to manufacture for everyone else too," the purchasing manager said. "By working with domestic suppliers, we are nipping our competition in the bud."

### Offshore Sourcing's Add-ons

From the outset, you should be prepared to add 20 percent to your quoted costs.

Cheap labor and generous government subsidies may allow overseas suppliers to offer initially attractive die casting piece-part costs. But North American company executives who have been trading overseas for several years generally agree it is not worthwhile to buy die castings offshore for anything less than a 15-20 percent margin. The "hidden costs" include travel budgets, larger inventories, and cash flow restrictions.

A large North American computer manufacturer is well aware of the potential problems linked with offshore sourcing and closely calculates its net economic value.

"The disadvantages of offshore sourcing are only offset by unit price—if you can keep control," stated one of its buyers. "With the long pipeline, it is difficult to react in a timely manner if engineering changes are necessary."

### Constant Troubleshooting

To combat problems that may arise from working with sophisticated die casting dies and tight tolerances, the company employs an independent quality inspection agency or has its own employees inspect for quality at the overseas die casting site before shipment is made. This extra cost of dealing with offshore

suppliers is considered necessary to combat quality problems. "When parts were not meeting specifications, we found ourselves backtracking hundreds and thousands of finished castings in various stages of delivery," the buyer said.

He outlined the chronology. "Manufacturing may take seven weeks if all goes well, but more likely it will take eight to ten weeks. Then there could be a week of waiting at the docks, four or five more weeks of actual shipping time, another six to eight days in customs, and three to five more days in land transportation. Needless to say, it is difficult to control engineering changes or quality problems once the pump is primed." Without being able to tap into shipments at any time—to stop them in midstream and reverse the transport process before it runs full cycle—changes become far more costly and take a great deal more time. This cost of backtracking and reversing the transportation cycle has weighed heavily on the "disadvantage" side of the company's offshore sourcing balance scale.

A small Southeastern fan manufacturer does not have the luxury of hiring an independent quality inspection agency to oversee production of die cast housings and blade holders produced overseas. The purchasing agent says she consistently finds that shipments "are not up to specifications." The parts are returned for rework, "wreaking havoc on production schedules."

This purchaser said her own choice would be to stick with domestic die casters, "who in the long run, are more economical." As it is, management allows her to maintain domestic sources as a backup. "I keep my guard up against overseas labor strikes and harbor strikes," she says.

### Customer Rejects

The problem of customer rejects was a nightmare to one Midwestern company. Attracted by both low tooling and low piece-part prices, they began working with an overseas die caster several years ago.

Initial production castings were of high quality, but the second run, for 35,000 parts, was refused by the customer on receipt. Problems arose first with getting replacement parts for the rejects, then obtaining credit for

the rejects, rework cost, scrap value, and disposal of the rejected parts. Any initial savings were dissipated, and the company returned to its domestic producer.

### Purchasing and Top Management

As "global sourcing" has become more and more of a procurement trend, the number-one reason given for the push has been lower costs. Publicized cost savings in tooling and high-volume die casting production appear so attractive, purchasing consultants point out, that some North American company top executives have virtually mandated that a certain percentage of purchases be directed offshore. Several purchasing agents report their own attempts to protest such mandates at their companies.

A vice president of purchasing at a small appliance company is waging a one-man campaign against the concept of management-assigned overseas purchases. But he has to do his job twice. He gets quotes on prices for new die cast parts from both state-side and offshore vendors. Based on his own experience, he then itemizes and adds to the offshore quotes each of the extra costs associated with ordering overseas.

"I keep hoping top management will be enlightened by what they see," he said. "No one is measuring the costs of doing business this way. These hidden costs are buried in other budgets and assumed to be part of the price of business generally. Nothing is further from the truth."

### The High Cost of Being There

A purchasing manager who is a consultant in the field says companies should consider two major things before they reach across the ocean.

■ First, overseas visits have proven to be an imperative, both in the initial investigation of the supplier and then to control failures and rejects. Travel budgets may balloon as a result. Relying on a trading company or manufacturer's representative may seem easier, but it can be an invitation to problems. "One trading company manager asked us to have tools built by a shop he represented," he says. "When we visited the shop we found one lathe, one drill press, and one grinder. We po-

lately informed him that his equipment was not suitable for our needs."

■ Second, be prepared to spend more time abroad to avoid miscommunication, he says. "It is difficult enough to communicate design clarifications to the guy across town. The difficulty is compounded with a language barrier. One U.S. engineer was led to believe that a supplier had an English-speaking person in-house. He found out, however,

### Offshore Sourcing: Open Secrets

#### Frozen Money & Other Nightmares

When manufacturers deal directly with offshore suppliers, payments for goods are generally made through a letter of credit. This calls for having funds on deposit with the bank so money can be drawn as needed, with final payment required before or at the time of shipment.

Rarely is the cost of "frozen cash" factored into the offshore supplier's quotation. "We have had our money tied up for four months or longer," an exercise equipment manufacturer reported. "And then we pray that the merchandise arrives in good, usable condition."

Why are crossed-fingers sometimes a necessary ingredient in offshore sourcing? A vice president at a large Chicago bank that specializes in international trade provided some insight. "With a sight draft, the supplier is entitled to receive payment just as soon as the proper documents appear at the bank. Neither you nor the bank has any right to review the shipment itself. If the documents supporting your transaction come in, and we find the bill of lading is not an original, you won't be able to take possession, even though it's the supplier's fault, not yours."

#### Legal Liabilities

It's an open secret that one reason for the lower cost of some castings manufactured offshore is the use of alloy that does not meet ASTM alloy specifications.

Testing of a zinc die cast component for a security device manufactured in Asia revealed high lead and low aluminum and manganese content, which could result in intergranular corrosion and accelerated failure of the part. Testing of a cast part for a large fan revealed

a potential for product failure due to out-of-spec alloy. Understandably, this is not a subject that company purchasing agents care to discuss, but the threat of future liability suits when vital components fail is all too real.

The cost of legal counsel also may be involved if the North American business plans to assist the offshore toolmaker in any way. Public Law 96-39 outlines possible liability for certain custom costs. Purchasing agents state that legal advice in this complex area is required if any such assistance is rendered.

### More True Stories

#### An electric motor manufacturer

planned to place orders for die cast motor housings at regular intervals to compensate for longer overseas lead times, postponing shipments if and when the supply outstripped the demand. Too late, the manufacturer discovered that the offshore supplier required larger minimums than anticipated to fill the shipping containers before they could be loaded on ocean vessels. The result was either a feast or famine of motor housings.

To help determine whether an overseas vendor could provide what an appliance manufacturer needed, a purchasing manager requested a copy of the company's standard practices manual. It was provided quickly but failed to clarify anything. It was written in the vendor's native language.

**An office machine manufacturer** on the West Coast placed an order with a Asian die caster for two castings to be finished and packaged as a subassembly. The price was based on a minimum order, which was nearly equal to the manufacturer's annual requirement.

Operating under the assumption that shipments could be staggered, managers were looking forward to substantial savings. Only after tooling was in progress was the company informed that the total quantity ordered would be the quantity shipped. The unanticipated investment and extra cost for necessary storage space for the subassemblies wiped out the anticipated saving.

**An automotive assembly plant** buyer worries about too little inventory, not too much. Although the offshore company provides the plant with scheduling data, forecasting is complicated and sometimes there is

a variance between what is scheduled and what is needed. If orders go up and the plant is caught without inventory, parts produced overseas must be shipped by expensive air freight. However, if the merchandise is already on a vessel, there is little that can be done except wait the four weeks shipping time.

### More Problems

Some purchasing managers are on call 24 hours a day, and most admit that the hidden, intangible costs of communication, time, travel, and inventory carrying time are rarely added into the cost quotation of dealing overseas.

"When estimating the cost of a part, I add in 10-12 percent to cover other costs, but there is no way to accurately measure the intangibles or to predict the possible problems," a buyer for a toy manufacturer noted.

"Besides, we tend to think of problems as one-time situations that won't be repeated. But that still does not take into account another problem that may occur."

Building vendor relationships through close communication is extremely difficult when dealing with an offshore supplier.

"There is no way to build a long-term relationship with an overseas buyer," one executive commented, "unless the company is willing to send some of its people overseas permanently or to employ people there. Global trading creates a complex situation in which problems are multiplied by cultural differences. How many buyers are equipped to understand the culture of a foreign people and work within that culture?"

### Leveraging Domestic Suppliers

A well-known manufacturer in the United States made a nationally acclaimed comeback after being left in the dust by the Japanese in the 1980s.

Management turned the company around by adopting Japanese techniques, but that didn't include adopting Asian suppliers. "We get our castings from suppliers within 100 miles of our plant," the purchasing manager explained, "and we've worked out a system of round-robin trucking that keeps our leased vehicles full and transportation costs down. You can't do that with overseas suppliers."

The production plant works from a greatly reduced inventory and is developing close relationships with its suppliers. That's more important than transoceanic sourcing for lower prices, the manager says. "We look for ways to lower our production costs, but we do not look for cheap prices, because purchasing castings that way doesn't add up to real savings. We used to do it that way—and it didn't work when the competition got tough. So we got smarter."

In turning the company around, the manufacturer asked its domestic suppliers for extended payment terms, which were granted. Other OEMs say domestic suppliers have adjusted terms of payment in various ways, either on tooling costs or part production. "You can't hope to get that with an overseas vendor," a buyer pointed out. "Minimums are often set, and up-front costs are low. There is no leverage for negotiation. So you take the price and absorb the extra costs. Most of the time it's a wash—if you're lucky."

### Weighing All Your Supply Options

Some buyers have resigned themselves to the twists and bends in the long transoceanic pipeline. They accept the problems of offshore sourcing as their cost of doing business.

But there are solid reasons to look more closely at the advantages of today's domestic custom die casting supply chain, and avoiding unpredictable offshoring problems. The advantages for coming home again are many:

#### Innovation

North American die casters offer solutions that improve product performance while reducing total manufacturing costs. They work with you as partners not just suppliers. North American die casters can participate in your product development meetings, collaborate on design and manufacturing, and add value by offering cost-reduction alternatives early in the design stage.

#### Integrity

Sourcing die cast parts in North America means consistent quality and protection of intellectual property. You can eliminate concerns about long-term costs associated with "first batch syndrome" (the first batch of

parts is fine, but the quality deteriorates in later batches). You can avoid discovering that your supplier has used sub-par raw materials. And your patents will protect you from copycats and foreign legal systems.

### Accessibility

Working with suppliers who are close to home ensures a flexible manufacturing strategy, on-time part delivery, and a faster product development cycle. And because you'll be able to communicate easily, you can work together to develop new products, new technologies, or

prototyping—all of which has proven difficult with someone from a radically different culture, with die casting engineers speaking a different language.

### Reliability

Using North American die casters lowers risk and product liability. North American die casters can be held accountable for their actions. If a product does not meet the stringent standards of the die casting industry, or if the manufacturer has any concerns, there are several ways to solve the problem, including,

if necessary, legal recourse. This option does not exist in many countries, especially those under Communist rule.

Many manufacturers say the enthusiasm they once had for offshore sourcing is fading.

"Our experiences have made us smarter, but not more profitable," says one executive. "Our overseas purchases are dwindling."

Many stated that in the future they will be working exclusively with North American die casters."

*This study of the experiences of North American original equipment manufacturers engaged in offshore sourcing of die castings is based on research jointly funded by the North American Die Casting Association (NADCA) and the U.S. Department of Commerce. Statements, findings, conclusions, recommendations, and other data in this report are solely those of the grantee/cooperator and/or its consultants and do not necessarily reflect the views of the U.S. Department of Commerce.*

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