WELDING PROCEDURES:
A RECIPE FOR SUCCESS

SPOTLIGHT ON
WRAYCO INDUSTRIES

ALSO INSIDE:
BUILDING A TEAMWORK CULTURE

TREGASKISS: ONE OF CANADA'S BEST AGAIN!

TOTAL COST OF OWNERSHIP – MAKING AN INFORMED DECISION
Dear Readers,

This year began on a high note for Tregaskiss as we requalified for Canada's 50 Best Managed Companies program for 2006. This marks the second year in a row that this honor has been bestowed upon our organization. Our continuous quest for excellence and innovation, combined with our unparalleled service, and a corporate culture that fosters teamwork, is the driving force behind this success. This issue's article, "How to Build A Teamwork Culture," provides some insight on corporate culture and tips for team building.

With sales expected to quadruple in the next 5 years, Wrayco Industries is a company moving into the fast lane. This month's Customer Focus article sheds some light on the strategies that are helping Wrayco realize this prosperity.

When purchasing a welding torch, it's important to consider what future costs you may incur. How long will the parts last? What are the maintenance costs? In this issue's article, "Making an Informed Decision," you will see what impact contact tip usage will have on the Total Cost of Ownership of a MIG torch, and what factors to consider when making your next purchase.

We've also cooked up a valuable R&D article on welding procedures that outlines a recipe for success in the industry – not to be confused with our recipe for delicious Diablo Wings that can be found in the Blender section.

We hope you find this issue of FUSION Magazine informative and interesting, and we look forward to bringing you more great articles in the future.

Sincerely,

Sam Sfetkidis
Editor
<table>
<thead>
<tr>
<th>Page</th>
<th>Section Headline</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>HOW TO BUILD A TEAMWORK CULTURE</td>
</tr>
<tr>
<td>5</td>
<td>TREGASKISS WELDING PRODUCTS – ONE OF CANADA’S BEST AGAIN!</td>
</tr>
<tr>
<td>6</td>
<td>CUSTOMER FOCUS: SPOTLIGHT ON WRAYCO</td>
</tr>
<tr>
<td>8</td>
<td>COVER STORY: WELDING PROCEDURES – A RECIPE FOR SUCCESS</td>
</tr>
<tr>
<td>11</td>
<td>ON THE HORIZON</td>
</tr>
<tr>
<td>12</td>
<td>TOTAL COST OF OWNERSHIP</td>
</tr>
<tr>
<td>14</td>
<td>FUSION BLENDER</td>
</tr>
</tbody>
</table>

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How to Build a TEAMWORK Culture

Fostering teamwork is creating a work culture that values collaboration. In a teamwork environment, people understand and believe that thinking, planning, decisions and actions are better when done cooperatively. People recognize, and even assimilate, the belief that "none of us is as good as all of us."

It’s hard to find work places that exemplify teamwork. In America, our institutions such as schools, our family structures, and our pastimes emphasize winning, being the best, and coming out on top. Workers are rarely raised in environments that emphasize true teamwork and collaboration. Organizations are working on valuing diverse people, ideas, backgrounds, and experiences. We have miles to go before valuing teams and teamwork will be the norm.

You can, however, create a teamwork culture by doing just a few things right. Admittedly, they’re the hard things, but with commitment and appreciation for the value, you can create an overall sense of teamwork in your organization.

CREATE A CULTURE OF TEAMWORK

To make teamwork happen, these powerful actions must occur:

• Executive leaders communicate the clear expectation that teamwork and collaboration are expected. No one completely owns a work area or process all by himself. People who own work processes and positions are open and receptive to ideas and input from others on the team.

• Executives model teamwork in their interaction with each other and the rest of the organization. They maintain teamwork even when things are going wrong. The temptation is to slip back into former team unfriendly behavior.

• The organization members talk about and identify the value of a teamwork culture. If values are formally written and shared, teamwork is one of the key five or six.

• Teamwork is rewarded and recognized. The lone ranger, even if she is an excellent producer, is valued less than the person who achieves results with others in teamwork. Compensation, bonuses, and rewards depend on collaborative practices as much as individual contributions and achievements.

• Important stories and folklore that people discuss within the company emphasize teamwork. (Remember the year the capsule team reduced scrap by 20 percent?) People who “do well” and are promoted within the company are team players.

• The performance management system places emphasis and value on teamwork. Often 360-degree feedback is integrated within the system.

TIPS FOR TEAM BUILDING

Do you immediately picture your group off at a resort playing games or hanging from ropes when you think of team building?

Traditionally, many organizations approached team building this way. Then they wondered why that wonderful sense of teamwork experienced at the retreat or seminar failed to impact long-term beliefs and actions back at work.

I’m not averse to retreats, planning sessions, seminars and team building activities – in fact, I lead them – but they have to be part of a larger teamwork effort. You will not build teamwork by "retreating" as a group for a couple of days each year. Think of team building as something you do every single day.

• Form teams to solve real work issues and to improve real work processes. Provide training in systematic methods so the team expends its energy on the project, not on figuring out how to work together as a team.

• Hold department meetings to review projects and progress, to obtain broad input, and to coordinate shared work processes. If team members are not getting along, examine the work processes they mutually own. The problem is not usually the personalities of the team members. It’s the fact that the team members often haven’t agreed on how they will deliver a product or a service, or the steps required to get something done.

• Build fun and shared occasions into the organization’s agenda. Hold pot luck lunches. Take the team to a sporting event. Sponsor dinners at a local restaurant. Go hiking or to an amusement park. Hold a monthly company meeting. Sponsor sports teams and encourage cheering team fans.

• Use ice-breakers and teamwork exercises at meetings. I worked with an organization that held a weekly staff meeting. Participants took turns bringing a “fun” ice-breaker to the meeting. These activities were limited to 10 minutes, but they helped participants laugh together and get to know each other – a small investment in a big-time sense of team.

• Celebrate team successes publicly. Buy everyone the same T-shirt or hat. Put team member names in a drawing for company merchandise and gift certificates. You are limited in teamwork only by your imagination.

"In a teamwork environment, people understand and believe that thinking, planning, decisions, and actions are better when done cooperatively."
TREGASKISS WELDING PRODUCTS – ONE OF CANADA’S BEST AGAIN!

TREGASKISS WELDING PRODUCTS of Windsor, Ontario, has requalified as a winner of Canada’s 50 Best Managed Companies program for 2006, Tregaskiss, a winner of the program in 2005, will maintain its status as one of Canada’s 50 Best Managed Companies. This prestigious national award is sponsored and judged by some of Canada’s finest institutions including Deloitte, CIBC Commercial Banking, National Post, and Queen’s School of Business.

Established in 1993, Canada’s 50 Best Managed Companies is a national program, recognizing Canadian-owned and managed companies that have implemented world-class business practices and created value in innovative ways. Applications are reviewed by an independent judging panel that evaluates how companies address various business challenges, including new technologies, globalization, brand management, leadership, leveraging and developing core competencies, designing information systems, and hiring the right talent to facilitate growth.

Why was Tregaskiss once again named one of Canada’s 50 Best Managed Companies? “Passion for change, innovation in applying leading business practices, and an ability to motivate employees were among the many characteristics that distinguished Tregaskiss Welding Products,” explained John Hughes, Partner, Private Company Services Group with Deloitte, a national sponsor of the Best Managed program.

Clive Tregaskiss, President and CEO of Tregaskiss commented, “I am very appreciative of the dedication and hard work of each and every member of the team. This accomplishment brings Tregaskiss to a new level of achievement and I am proud of the people that have developed the company.”

In 2006 Tregaskiss undertook a number of new strategic initiatives – one of the biggest being a joint venture that led to the creation of Tregaskiss International.

Bob Campbell, Vice President and General Manager at Tregaskiss commented, “Being our customers’ number one choice is a tenet of the Tregaskiss culture. No matter what the state of the economy and the competitive environment, we are confident that the members of our team will continue to serve customers successfully. We have continued to develop our culture and applied those business disciplines that contributed to our success in the past.”

For more information please visit www.canadas50best.com.

TREGASKISS CELEBRATES 40 YEARS

Tregaskiss Welding Products is celebrating 40 years of manufacturing premium MIG welding products. Founded in 1967 by toolmaker William Tregaskiss, Tregaskiss introduced the Auto 350 MIG torch to meet the harsh demands of automotive plants. Designed in cooperation with Ford Motor Company, the Auto 350’s reputation as a durable MIG torch solidified itself as the standard in the auto industry.

In the years to follow, Tregaskiss continued to grow and place emphasis on R&D and pioneering robotics. Commitment to R&D leadership and innovation led to the launch of our TOUGH GUN® line of semi-automatic and robotic torches and our patented TOUGH LOCK® Contact Tip System.

Over the past 40 years, Tregaskiss has developed a number of industry first features such as our reversible cable, spring strain relief, Robotic Quick Change components and precision key alignment system. Recent product innovations include our TOUGH GUN I.C.E.® Robotic Torch, SURESTART™ Contact Tips and QUICK LOAD® Liner.

In 2005 and again in 2006, Tregaskiss was a winner of Canada’s 50 Best Managed Companies program. Also in 2006, in an effort to strengthen our global reach, Tregaskiss embarked on a joint venture with Browne Distribution International to create Tregaskiss International.

Tregaskiss has achieved tremendous success – and the future is even brighter. With the commitment and determination of our employees leading the way, we will continue to grow and respond to the needs of an ever-changing global market to remain our customers’ number one choice.
In 1980, the company employed five people and occupied 16,000 square feet of space. Today, Wrayco employs over 190 people, and occupies over 40,000 square feet of space, and processes over 150,000 pounds of steel per day. A 160,000 square foot, $30 million expansion will soon be completed, and 100 new employees will be hired. Sales are expected to quadruple to $80-100 million in the next five years.

Wrayco's list of customers is an impressive one and includes companies such as Caterpillar, Volvo, Case-New Holland, FMC, Grove Manufacturing, Kamar and JCB.

Wrayco attributes its success to its manufacturing processes and to its people. Their quality statement, “The manufacture of superior quality products delivered on time is our highest priority,” is achieved through a sound quality management system that ensures products are made right the first time and delivered on time. Wrayco’s lean manufacturing initiatives, coupled with their Six Sigma program, creates flow and eliminates waste in every area and stage of work including customer relations, product design, supplier networks and factory management.

A visit to their facilities reveals a true testament to their philosophies: there are no enclosed areas in the plant; there is tight process control in place; equipment is state-of-the-art; and employees are cross trained to be conscious of quality and productivity. Wrayco boasts high WIP (Work In Progress) turns of 220. High WIP turns generally equate to lower
inventory, higher output, and higher quality. “You need these processes in place to be able to manufacture superior products and to have them delivered to the customer on time,” says Gary Gibb.

Wrayco currently loads and ships 13 semi trailers a day with a very impressive on-time delivery rate of 96%. “The nature of this business is that there is a lot of pressure, and you need excellent suppliers to help relieve that pressure,” says Gibb.

For its MIG welding needs, Wrayco has aligned with Tregaskiss Welding Products, an OEM supplier with an equally impressive quality management process and on-time delivery rate. Tregaskiss prides itself in delivering innovative welding products and extraordinary customer support to remain customers’ number one choice.

For over three years, Wrayco has relied on Tregaskiss for the latest in MIG welding technology. “Welding is a very complex and critical process that people have taken for granted,” says Gibb. “Tregaskiss has helped us to relieve the pressures associated with MIG welding. We have been with other suppliers, but Tregaskiss has done an excellent job in providing us with our MIG gun needs. They have facilitated our need to assure the process is under control. They meet our expectations and make sure we get what we are paying for.”

Wrayco currently has six TOUGH GUN® Robotic Torches (with another four coming), and over 100 TOUGH GUN Semi-Automatic MIG Torches. Gibb adds, “Weight and size are huge considerations, and Tregaskiss has been able to provide a very good mix for us. Our welders find the torches comfortable and ergonomically designed.”

Prior to using Tregaskiss Torches, Wrayco was using competitive OEM products, but they experienced numerous ongoing issues and chronic repairs. “In this business you can’t afford to be down for an hour. Tregaskiss has helped with their dependable products and service,” comments Gibb.

Welding Engineer Jim Jeffries echoes those sentiments. “People who support Wrayco help us solve problems,” says Jim. “Tregaskiss helps us solve our MIG welding problems.” Jeffries points out, “It’s guys like our Tregaskiss Regional Business Manager Howard Fisher who make the difference.” He further adds, “Tregaskiss has a wonderful history of product improvements, but it’s the people with positive attitudes that make the difference.”

The synergistic relationship that has developed has ensured Wrayco gets the products and services they need. “Wrayco needs to be technologically advanced to survive. The combination of service, support and price of Tregaskiss products, coupled with the flexibility of their distributor Pro-Weld Service and Supply, helps us achieve our technical needs. Tregaskiss is willing to do anything to help us,” says Jeffries.

Special products such as multi-schedule switches and custom gooseneck configurations were engineered specifically for Wrayco. “It is a wonderful relationship,” adds Jeffries.

“Wrayco needs to be technologically advanced to survive. The combination of service, support and price of Tregaskiss products, coupled with the flexibility of their distributor Pro-Weld Service and Supply, helps us achieve our technical needs. Tregaskiss is willing to do anything to help us,” says Jeffries.

The talented people, quality management systems and excellent supplier relationships Wrayco already has in place ensures the company will continue to manufacture superior quality products. Tregaskiss’ relationship with Wrayco will aid in efforts to sustain and ultimately surpass the tremendous growth the company has experienced over the past five years. As both companies look toward the future, Wrayco and Tregaskiss will continue to benefit and grow together through a solid relationship built on trust, continual product innovation and excellent customer service.

Sam Sfetkidis is Editor of Fusion Magazine

“The manufacture of superior quality products delivered on time is our highest priority”
Welding procedures are often used because they are a requirement of the applicable code or standard governing fabrication of the product being produced. They have a variety of names and acronyms, including Welding Procedure Specifications (WPS) in accordance with ASME Boiler & Pressure Vessel Code, and Welding Procedure Data Sheets (WPDS) that are required by the CSA W59 Structural Steel Welding Standard. Other documents are sometimes used to document the general welding process, and list both data used when welding a qualification assembly and the results of required testing, such as tensile testing or chemical analysis. An example of this document is the Procedure Qualification Record (PQR) required to support any WPS for ASME applications. While the PQR does serve an important role, that type of document is not intended for use by shop floor personnel and is not considered a welding procedure.

Control of Weld Quality and Productivity

An important function of welding procedures is to help ensure the high quality of welded products. Procedures are often qualified by welding assemblies and then testing with methods to guarantee they have the properties to meet application demands. A change in a variable defined as “essential” would require a requalification, as it could result in a change in weld properties. A change in a variable defined as “non-essential” would not need to be requalified, but would need a new welding procedure as it could affect weld soundness. A change in groove design is an example of the latter kind of change. If production welds are made within this framework of proven and defined welding procedures, quality welding should result.

While procedures have often been used to control weld quality, another benefit of using documented welding procedures can be productivity gains. Some welding processes can be used within a wide range of operating variables. Without guidance or a

A WELDING PROCEDURE is a document that is intended to provide guidance for welding activities by defining the variables to be used for making production welds. These documents are used by fitters to determine pre-weld preparation and fit-up, by welders to perform specified welding, and by inspectors to verify compliance with procedure requirements. An appropriate analogy is to consider the procedure as a welding “recipe,” with the variables and data specified substituting for the ingredients and amounts to be used. Like a good recipe, which must do more than list ingredients, a good welding procedure will include notes and instructions to accompany the itemized list and data.
procedure to follow, a welder instructed only to use the GMAW process may weld at 200 ipm, 600 ipm or any wire-feed speed in between. This example is extreme, but the three-fold increase in productivity illustrates the possible result of leaving welding parameters up to the discretion of the individual welder. Other items that may have a significant effect on welding productivity include the process used, the electrode diameter used, and the joint design used. From a dollars and cents standpoint, all variables affecting the productivity of a welding application should be looked at closely, with the optimum parameters defined on a procedure.

Development, Format and Implementation

Too often, procedures have been documented only for code compliance using canned data from a reference source. Proper welding procedure development should involve experimentation to define optimum parameters, including weld-joint design and fit-up, as well as process variables specifying values or ranges where appropriate. While there are many good reference resources that can be used as a starting point for defining procedures, an investment in experimentation during procedure development can provide big gains in both welding quality and productivity.

Once these optimum procedure variables have been defined, how should they be presented on a procedure document? Procedures have been documented in many formats, including written paragraphs, tables, sketches and combinations of these items. In some cases, the applicable code, standard or jurisdiction responsible for monitoring compliance has sample welding procedure forms that can be used.

In considering which format or form to use, the primary function of the procedure should be kept in mind: that is, to provide guidance and instructions for personnel in carrying out welding activities. Adding data to an “off-the-shelf” form sometimes results in a confusing array of data and variables that may include information not relevant to the procedure being used.

Fabricators need to understand that welding procedures can be written in virtually any format, provided the information needed for code compliance is included. If documents can be presented in a simple and easy-to-read format, the chance that they’ll actually be used increases. Figure 1 illustrates a sample welding procedure that includes instructions with notes, sketches and tabular data. Items like electrode classification and diameter should be specified with single values, while other values, such as amperage or electrode stickout, should be specified with appropriate ranges or plus/minus tolerances. In a quality-assured environment, specifying single values only invites non-compliance reports. Welding procedures can be developed in any format with considerations including welding process, level of automation, application requirements and the skills and literacy of personnel.

Today’s software tools have improved the efficiency of welding procedure documentation. Using templates in word processing or forms programs eliminates the need for duplication of common procedure elements. For example, the first WPS created from a single PQR could be duplicated for other WPSs, changing only the non-essential variable elements such as welding position or joint design. In custom fabrication shops that use a wide variety of materials and welding...
procedures, database software can simplify the process of searching for appropriate procedures to use for new contracts. Some vendors supply dedicated welding management software that can be used to document procedures and provide other benefits such as logging and flagging requirements for welder performance qualification testing.

If 50 welders are given instructions only to make a full-penetration groove weld to join 1/2-inch-thick steel plate, many different techniques will probably be used. Which joint preparation, process, electrode, wire-feed speed and shielding-gas-flow rate to use are only some of the selections to be made. If all techniques are evaluated, it may be possible to select the procedure that provides optimum results and have all 50 welders use that procedure.

Assuming welding procedures with concise instructions in an easy-to-understand format are developed, the next consideration is how to ensure these procedures are actually followed on the shop floor. In some cases, welding procedures are hidden in filing cabinets and are on display only during customer or third-party inspections. Welding procedures can help to control welding quality and productivity only if they are used by production personnel. Acceptance and application of procedures can be improved by involving production personnel in procedure development, training where necessary, and routine monitoring.

**Qualification and Pre-Qualification**

Another consideration for welding-procedure documentation deals with the “pre-qualified” option provided by some codes and standards. CSA W59-03, for example, lists criteria and sketches for partial- and full-penetration welds for the SMAW, FCAW, MCAW, GMAW-Sp and SAW processes. The concept here is that if fabricators document procedures in accordance with the specifications and minimum weld-joint preparation dimensions specified in Clause 10, the WPDSs do not have to be qualified by procedure testing as witnessed by the certifying jurisdiction, the Canadian Welding Bureau (CWB). This ensures proven welding procedures are used and saves the time and expense of procedure qualification.

In some cases, however, this investment in procedure qualification can result in significant savings. If, for example, a full-penetration groove-weld procedure is needed for submerged arc welding of 3/4-inch-thick steel onto a backing bar, then a 5/8-inch root gap would be needed using a 20° included angle, as shown in Figure 2. If it can be proven through experimentation and procedure qualification that a full-penetration procedure can be achieved with less root gap or a bevel angle, the procedure would then be approved by the CWB.

Senior welding technology students at Conestoga College have an SAW lab assignment in which, using the S2-1 as a reference, they must do procedure experimentation to minimize the joint design and then do a calculation to determine how many feet of weld would be required to pay back a hypothetical $1,500 investment in procedure qualification. The second illustration in Figure 2 shows a joint design that provided full penetration as proven by metallographic testing and the calculations showing how many feet of weld would be paid off after only 24 feet of welding and that additional welding costs have been lowered by 59%.

So, while there may be short-term gains from using pre-qualified welding procedures, experimentation to prove alternate procedures and the investment in procedure qualification may provide a recipe for welding-cost savings.

Karsten Madsen is the Coordinator for Welding Programs at Conestoga College in Guelph, Ontario, Canada.

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<table>
<thead>
<tr>
<th>EVENT</th>
<th>DATES</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FEIMAFE</strong></td>
<td>May 21-26, 2007</td>
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<td><strong>EASTEC 2007 Exposition</strong></td>
<td>May 22-24, 2007</td>
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<td>Chicago, Illinois, USA</td>
</tr>
<tr>
<td><strong>International Workboat Show 2007</strong></td>
<td>November 28-30, 2007</td>
<td>New Orleans, Louisiana, USA</td>
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<tr>
<td><strong>WELDMEX</strong></td>
<td>January 29-31, 2008</td>
<td>Mexico City, Mexico</td>
</tr>
<tr>
<td><strong>CONEXPO 2008</strong></td>
<td>March 11-15, 2008</td>
<td>Las Vegas, Nevada, USA</td>
</tr>
</tbody>
</table>

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Every day we are faced with opportunities to purchase a product or a service. How many times do we ask ourselves is it worth it? Am I paying too much? How much time will all of this involve? This decision-making process applies to both our personal lives and our professional lives and we often utilize similar methods of cost analysis before making a decision.

A Total Cost of Ownership (TCO) assessment ideally offers a final statement reflecting not only the cost of purchase, but all aspects of the further use and maintenance of the equipment, device, or system considered. This includes the costs of training support personnel and the users of the system, costs associated with production, floor space, electricity, repairs, development expenses and quality assurance.

These are some of the same factors that are used by manufacturers when considering the purchase of a MIG welding torch.

More specifically, some of the key variables that a company should examine in order to determine if a purchase is cost effective include:
- Causes of downtime directly related to MIG torch performance
- Estimated time required to correct determined causes of downtime
- Estimated total torch life
- Total quantities of all MIG torch components used over a one-year period
- Estimated parts life for all consumable components
- Estimated downtime required to change out the torch or a component
- Existing production numbers during a set period of time
- Average number of rework parts related to MIG torch performance
- Average number of scrap parts related to MIG torch performance
- Average maintenance cost per torch per month and per year
- MIG torch price
- Component prices
- Warranty

In the contact tip cost analysis below, we will examine the overall effect of contact tip performance on the Total Cost of Ownership of a MIG torch.

Traditionally contact tip volumes are the highest of all consumable items and will tend to have the highest impact on production and overall production cost and savings.

<table>
<thead>
<tr>
<th>CONTACT TIP COST ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Tip Usage Savings</td>
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<tr>
<td>Avg. Number of Tips Used Per Shift</td>
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<tr>
<td>Total Shifts</td>
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<tr>
<td>Total Tips Used During Trial</td>
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<tr>
<td>Total Number of Robotic Torches</td>
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<td>Est. Tips Used in One Year</td>
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<tr>
<td>Contact Tip Cost</td>
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<td>Estimated Contact Tip Costs Based on Usages</td>
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<td>Avg. Time to Change a Contact Tip (in minutes)</td>
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<td>Total Est. Cost of Lost Production from Tip Changes</td>
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<td>Cost Per End User Part</td>
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<td>Avg. Scrap Parts Per Month</td>
<td>63</td>
<td>4.2</td>
</tr>
<tr>
<td>Avg. Scrap Parts Per Year / Per Robot</td>
<td>756</td>
<td>50.4</td>
</tr>
<tr>
<td>Total Number of Robotic Torches</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Avg. Cost Per Scrap Part</td>
<td>$15.00</td>
<td>$15.00</td>
</tr>
<tr>
<td>Estimated Scrap Parts Dollars Per Year</td>
<td>$823,700</td>
<td>$41,580</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summary of Total Contact Tip Costs</th>
<th>Torch 1</th>
<th>Torch 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Tip Costs Per Year</td>
<td>$40,748</td>
<td>$23,285</td>
</tr>
<tr>
<td>Lost Production Dollars Per Year</td>
<td>$2,721,600</td>
<td>$136,080</td>
</tr>
<tr>
<td>Scrap Parts Costs Per Year</td>
<td>$823,700</td>
<td>$41,580</td>
</tr>
<tr>
<td>Estimated Total Contact Tips Costs Per Year</td>
<td>$3,386,048</td>
<td>$200,945</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summary of Contact Tip Savings</th>
<th>Torch 1</th>
<th>Torch 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Tip Dollar Savings</td>
<td>$17,464</td>
<td>$3,185,103</td>
</tr>
<tr>
<td>Production Dollars Gained</td>
<td>$2,585,520</td>
<td>$2,585,520</td>
</tr>
<tr>
<td>Scrap Parts Savings</td>
<td>$582,120</td>
<td>$582,120</td>
</tr>
<tr>
<td>Estimated Summary of Contact Tip Savings</td>
<td>$3,386,048</td>
<td>$3,386,048</td>
</tr>
</tbody>
</table>

When examining the TCO of a MIG torch we can see what impact contact tip usage has on overall cost. Torch 2 realizes $3,185,103 in savings when contact tip cost, production costs and scrap parts costs are examined. If we were to factor in all components of a MIG torch, TCO can be greatly affected. This again emphasizes the importance of considering all variables during the purchase decision to ensure that you’re getting the best overall value.
For over 40 years, leading manufacturers in the transportation and heavy equipment industries have trusted and relied on TOUGH GUN® Robotic MIG Torches and Peripherals from Tregaskiss.

Our pursuit of excellence has led to the continuous development and improvement of innovative product features like our:

• Patented TOUGH LOCK® Contact Tip System
• I.C.E. (Integrated Cooling Enhancer)
• TOUGH GUN Reamer – Robotic Nozzle Cleaning Station

What does this mean to you? Lower TOTAL COST OF OWNERSHIP.

• Lower maintenance costs
• Reduced downtime

TOUGH GUN Robotic MIG Torches and Peripherals from Tregaskiss. Never Compromise Your Bottom Line.

Contact Tregaskiss today at 1-800-787-6966 or visit us online at www.tregaskiss.com.
HEADGAMES
Do you know your welding facts? Try these brain-busting questions and test your knowledge.

1. In Flux Cored ARC Welding (FCAW), the flux core may contain:
   a) minerals  b) ferroalloys  c) materials providing deoxidizers and gas shield  d) slag forming materials  e) all of the above

2. In GMAW, “SLOPE” refers to _________________________.

3. A defect within a weld resulting in an inclusion or a void when a pass is made over an undercut area at the toes of a weld is referred to as:
   a) incomplete fusion  b) wagon tracks  c) bridging  d) skip weld

4. The changing of a stainless steel’s physical properties when being exposed to a temperature range of 800°F to 1600°F is known as:
   a) residual stress  b) quenching  c) sensitization  d) inductance

The answers for questions 1-3 are provided below. Email the correct answer for question #4 with “HeadGames” in the subject line to: fusionmagazine@tregaskiss.com. One lucky entrant will win a MYSTERY GIFT!

CONGRATULATIONS to Eugene Boan of Hopkinsville, Kentucky, for correctly answering last issue’s HeadGames trivia question: *When describing the fundamentals of a good weld, three relationships with regard to electrode wire position are important. Two of them are direction of travel speed and travel angle. What is the third?* The answer is: work angle. Eugene won a cool Tregaskiss jacket.

DIABLOWINGSNBLUECHEESEDIP
Put some sizzle into your spring season with this sure-fire party hit. WARNING: Liquid refreshments may go quickly.

**INGREDIENTS:**

**Dip**
- 1/2 cup sour cream
- 1/2 cup mayonnaise
- 2 teaspoons white wine vinegar
- 1 tablespoon fresh parsley, chopped
- 1 tablespoon green onions, chopped
- 1/2 teaspoon garlic, minced
- 1/2 teaspoon Tabasco sauce
- 3 tablespoons blue cheese, crumbled
- Salt and pepper, to taste

**Chicken Wings**
- 12 chicken wings
- Vegetable oil (for frying)
- 4 tablespoons butter or margarine, melted
- 1 teaspoon catsup
- 1 teaspoon Tabasco sauce
- Celery sticks

**DIRECTIONS:**

In a bowl, beat together all of the dip ingredients until blended. Set aside.

Remove the tips from the wings and discard. Separate the first and second joints of the wings with a sharp knife. Pat the wings dry with paper towels.

In a heavy saucepan, heat about 2 inches of oil to 350°F on a deep frying thermometer. Fry the wings a few at a time, for about 6 minutes, until golden brown on all sides. Drain on paper towels.

In a small bowl, mix the butter, catsup and Tabasco sauce. Toss the wings in the butter mixture to coat thoroughly. Serve hot, and pass the dip and celery sticks.

FASTFACTS

- Enough aluminum cans were recycled last year to fill a hollow Empire State Building 24 times.
- Pure copper’s melting point is 1,981°F (1,083°C).
- The penny contains only 2.6% copper. In 1982, the U.S. Mint converted production of the 95% copper coin to a predominantly zinc alloy, but coated it with copper to preserve its appearance.
- We’re in no danger of running out of copper. Known worldwide resources of this important and valuable metal are estimated at nearly 5.8 trillion pounds of which only about 0.7 trillion (12%) have been mined throughout history.
HUMDINGER HEADLINES

Fancy yourself a writer? Can you come up with a humorous caption for this issue’s photo? The top three entries will appear in our next issue, and each winner will receive a free golf shirt! Email your entry with “Humdinger Headlines” in the subject line to: fusionmagazine@tregaskiss.com.

Here’s ours: “Simba apologizes for her catty comments.”

HUMDINGER HEADLINES WINNERS

Congratulations to the top three winners from our last issue.
Here are their contributions:

1. “Wow! I just saw the TOUGH GUN Girls!”
   - Clime Bourdon, Montréal, Québec
2. “WHAT!!! You mean Clint Eastwood is not my Daddy??!”
   - John Boyce, Sandusky, Ohio
3. “I ran over the handle with my car, and it didn’t break!”
   - Michael Stacenko, Ottawa, Ontario

DID YOU KNOW?

On October 17, 1814, a ruptured tank at the Meux and Company Brewery unleashed over 3,500 barrels of beer onto the streets of London, creating a wave of beer that knocked down walls, flooded basements, and demolished houses. Eight people drowned. The ninth died of alcohol poisoning after attempting to stop the flood by drinking the beer.

Hot Springs, New Mexico, decided to change its town’s name – and its future – back in 1950. In that year Ralph Edwards promised to heap free publicity on any city or town that would rename itself after his famous radio show, “Truth or Consequences.” The Hot Springs folks said okay. Good to his word, Edwards devoted many hours of broadcasting direct from the new namesake, and the resulting fame helped swell the population to over 6,000. Next time you’re in southwest New Mexico, drop in at Truth or Consequences.

WACKY SPORTS STORIES

KEEP ON ROLLING

In 1990 during the last lap of the DieHard 500 at Talladega, Michael Waltrip and Kenny Schrader got together and wrecked on the back straightaway. Jimmy Spencer slid into the wreck and his car became airborne. The car went into a barrel roll until his car landed right side up. He continued on and finished the race.

SPANISH PARALYMPIANS - HOW LOW CAN YOU GO?

Pretending to be unintelligent generally has minimal benefits, but the Spanish Paralympic Committee saw otherwise. They produced fake documents for 10 of the 12 members on their 2000 Paralympics basketball team, falsely claiming they had IQs below 85. With an amazing performance, their intellectually able team captured the gold medal in a tournament for the intellectually disabled. It was soon discovered that the majority of their team members had no mental deficiencies to speak of, and their medals were stripped.
fusion \fyu-zhən\ n. often attrib [L. fusion-, fusio, fr. fundère]
a merging of diverse, distinct or separate elements into a unified whole.