



Reality - 2007

- Baby boomers retiring.
 - Broad range of welding experience leaving the workplace.
- New grads show low interest in welding.
- Technology creating more uses for welding.



Recently Published Articles

- “Where have all the Welders gone?”

Wall Street Journal – 8/15/06

- “Skilled Labor Shortage Hurts U.S.”

CNN Money.com 1/5/07



Welding Information

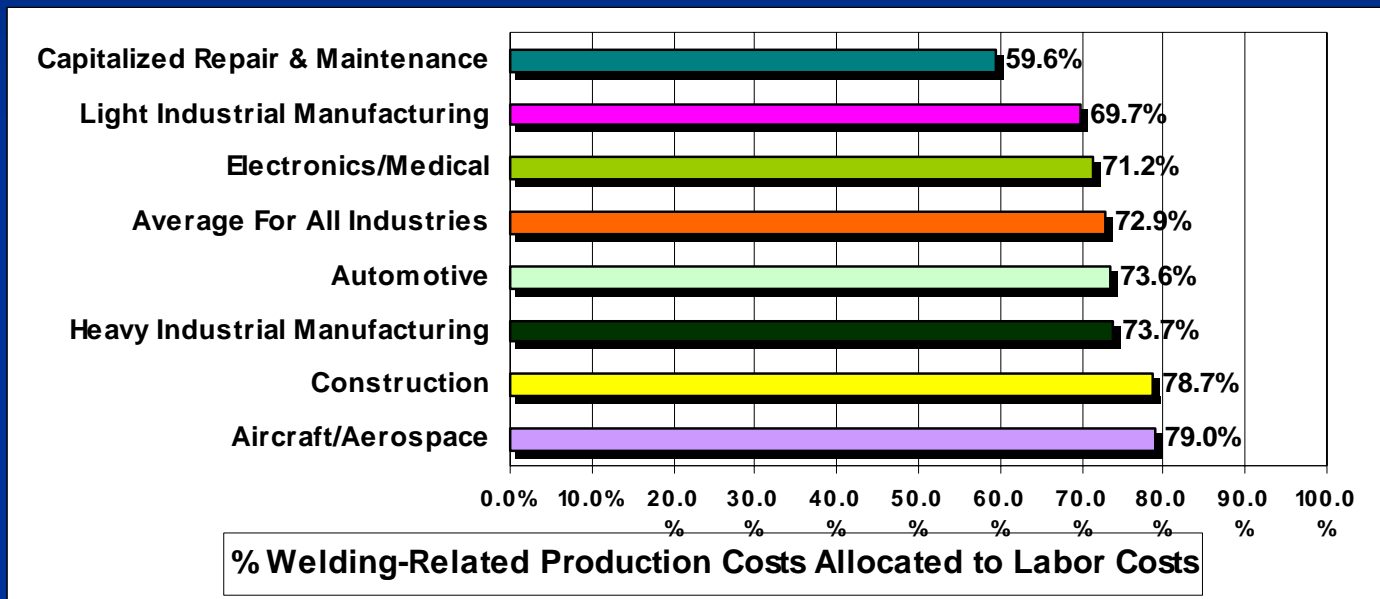
American Welding Society, The Bureau of Export Administration.

- Labor represents the largest proportion of total welding expenditures. Labor represents over 70% of total welding-related expenditures (\$22.0 Billion in 2000)
- Most firms have not studied, and have only minimal understanding of, the economics associated with the use of welding-related processes.
- Over 40% of Heavy Industrial Manufacturing firms indicated that a shortage of qualified welders impacts productivity either “moderately” or “extensively”. Approximately 30% of the firms in the Automotive and Construction industrial sectors indicated similar levels of impact.
- Almost 50% of companies studied reported their welding training needs not adequately met.



AWA Survey

Percentage of Total Welding Production Costs Allocated To Labor Costs



Labor accounts on average 73% of all welding costs - Wow!



Opportunities for Productivity Improvement and Labor Savings in Welded Piping Systems



- Automation of welding processes
- Greater consideration of welding requirements during piping design
- Improved quality control in materials and components to be joined
- Use of lean manufacturing approaches
- Increased knowledge sharing of productive practices between and among industries
- Cooperative R&D programs



So What Does All This Mean????

- Less skilled welders available in the job market.
- Welding costs and productivity accounting are lacking in the marketplace. There is a minimal understanding of welding economics.
- Welding defect rates in most industries are high.



Belled-End Pipe Fittings

Background

- Belled-end pipe fittings have tangent ends that are belled to form a socket.
- Standardized design MSS SP-119 - Belled end replaces cast socket weld, forged socket weld and butt weld fittings.

Benefits

- Equal in allowable internal burst pressures to ASME B16.9
- Fillet weld as opposed to butt weld
 - Faster
 - Easier
 - Accommodates most welder skill levels
- More robust weld
- Can easily be inspected



Belled-End Pipe Fittings

Benefits (cont.)

- Unlike cast and forged socket weld fittings which are thicker and rigid, Belled end fittings are manufactured from starting stock with wall thicknesses very close to that of the pipe to which they will be joined. When joined this creates a “flex continuum” and moves inherent stresses away

from the joint and into the sidewalls of the fittings. When tested and compared to cast and forged socket weld and butt welding fittings Belled end fittings were found to be “equal in burst and superior in fatigue” testing.



WELDING

FILLET

INSIGNIFICANT

NEARLY ZERO

LOW TO MODERATE

HIGH

VS

PRE-WELD JOINT PREP

PRE-WELD FIT UP

SKILL LEVEL

FORGIVENESS

BUTT

MODERATE

SIGNIFICANT

HIGH

LOW

FORGIVENESS ??? – ABILITY TO ACCOMMODATE A VARIETY OF POSSIBLE VARIANCES, I.E. SQUARENESS, OVALITY, WALL THICKNESS MISMATCH, MIS-ALIGNMENT



Belled End Fittings Provide:

- Easier welding
 - Fillet welds as opposed to butt welds can be done in most cases (4 to 7 x faster)
 - Lower welding skill required
 - Lower labor costs - Increase in productivity
 - Less prep time
 - Reduced inspection time
- Reliable finished welds
 - **Belled end eliminates problems** with misalignment and wall thickness mismatch inherent in butt weld joints and internal deformities from “burn through”, i.e. “craters, fissures and icicles”
- High alloy products for stringent requirements





Belled End Fittings

Cost of Ownership Savings

- 75-80% Joint Preparation Time Savings
 - No pipe end or fitting end machining
- 20-30% Fitter + Welder Labor Rate Savings
 - Lower skills required
- 10-20% Welder Labor Time Savings
 - Reduced welding time

SAVINGS = \$\$\$\$\$



Did you know...?

You can use:

2" Sch 10 304L A312 welded pipe and
MSS SP119 Belled-End fittings @ 1000
psi and 200F

***Based on calculations IAW ANSI B31.3



So - As you are designing...

- Choose your fittings carefully.
- Analyze the design practicality.
- The \$aving\$ in time and money can be truly significant.
- And the most cost effective choice is nearly always *Belled End Fittings* !!!!

Learn more about Belled End Fittings at www.bestweld.com!