IX. Cost Considerations of the GTAW Process

It is important to take into consideration all the facts that relate to a welding situation when attempting to attach a cost to a foot of weld. Not only do direct costs such as filler wire, shielding gas, equipment, and labor have a bearing, but indirect costs such as overhead and training of personnel have an affect as well.

Training should be considered in the cost since GTAW is generally considered a more advanced process and will require time by the welder to familiarize with the technical and manipulative aspects of the process.

The cost of proper equipment to efficiently accomplish the job at hand is of great importance. Manual GTAW equipment in a production setup can run into thousands of dollars. If there are many repetitive welds, automatic equipment should be considered, and those costs can run into the tens of thousands of dollars.

A cost evaluation of a welding process should include:

1. Labor and overhead cost per foot of weld.
2. Filler wire cost per foot of weld.
3. Gas cost per foot of weld.
4. Power cost per foot of weld.

Computing these figures on a chart or proposal will show the economics of a particular process.

Standard formulas for cost estimating as presented in this book (Figure 9.1) are a reasonable measure for computing data for cost comparison.

The formulas as presented have no "plug-in" numerical values. The values will vary with each application and each company.

Formulas to Figure Total Welding Cost
1. $\text{Labor} = \dfrac{\text{Welder Rate in \$ Per Hour}}{\text{Weld Travel Speed (IPM)} \times \text{Duty Cycle} \times \frac{60\ \text{min./hr.}}{12\text{"/ft.}}} = \text{Cost per ft.}$
2. $\text{Overhead} = \dfrac{\text{Overhead Rate}}{\text{Weld Travel Speed (IPM)} \times \text{Duty Cycle} \times \frac{60\ \text{min./hr.}}{12\text{"/ft.}}} = \text{Cost per ft.}$
3. Filler Metal Cost Foot of Weld = Weight of Deposit x Filler Metal Cost / Deposition Efficiency
4. $\text{Gas} = \dfrac{\text{Cost of Gas/cu. ft.} \times \text{Flow Rate (cfh)}}{\text{Weld Travel Speed (IPM)} \times \frac{60\ \text{min./hr.}}{12\text{"/ft.}}} = \text{Cost per ft.}$
5. $\text{Power} = \dfrac{\text{Volts} \times \text{amps} \times \text{power cost/kw. hr.}}{\text{Weld Travel Speed (IPM)} \times \text{Machine Efficiency} \times \frac{60\ \text{min./hr.} \times 1000}{12\text{"/ft.}}} = \text{Cost per ft.}$
6. Total = Total of Above Applying Formulas x Total Length of Weld = Total Cost

*The factor 5 will appear in some of the formula examples: This was derived from the ratio of: $\dfrac{60\ \text{min./hr.}}{12\text{"/ft.}}$

Figure 9.1 Formulas for cost considerations.