

EVALUATION CHECKLIST FOR AN ARC WELDING ROBOT SYSTEM

I. CAN YOU JUSTIFY AN ARC WELDING ROBOT SYSTEM?

Answer either yes or no to the following questions to determine if your business can justify the addition of an arc welding robot system.

- A. Is arc welding an integral part of your manufacturing process?
- B. Are you experiencing quality problems or competitive cost pressures from your customers?
- C. Do you have difficulty in hiring qualified welders?
- D. Is your turnover of trained welders excessive?
- E. Are your training costs increasing?
- F. Do your lot sizes or part sizes justify investigating robotics?
- G. Are your components that go into a welded assembly dimensionally repeatable?
- H. Are your welding fixtures capable of holding the component parts in the same place for welding each time?
- I. Are your welders having difficulty welding thin materials without burnthrough?
- J. Are your competitors installing arc welding robots or other programmable welding systems?
- K. Are your labor costs increasing faster than the inflation rate?

If you answered “yes” to many of the questions above, then you may need a robotic arc welding system. Continue with the checklist to consider further factors.

II. WHAT ARE YOUR PERFORMANCE EXPECTATIONS FOR A ROBOTIC WELDING SYSTEM?

Establish your goals and expectations for a robotic welding system before you commit to purchasing a robot system.

Your expectations must be realistic.

A robotic welding system cannot solve basic problems of improper part design, highly variable piece part tolerances, and inadequate fixturing allowing the clamped assembly to move or have excessive gaps in the weld joint.

A robotic welding system *CAN*:

- Improve welding productivity by a minimum of 100% and as much as 300% in some cases.
- Reduce operator-training time.
- Reduce operator cost.
- Reduce weld wire consumption by making smaller and consistent size welds.
- Reduce overwelding.
- Reduce weld wire cost by allowing use of larger bulk packages.
- Reduce inspection costs.
- Reduce burnthrough on thin materials.
- Minimize post weld distortion.
- Improve weld quality.
- Reduce after-welding cleanup.
- Reduce floor space with higher productivity.
- Reduce gas consumption with faster travel speeds.
- Reduce work-in-process inventory.

III. SELECTION PROCESS

If you've come this far, you must be seriously considering catapulting your productivity with an automated welding system. When looking at various vendors and systems, be sure to consider the following points.

- A. Select a vendor that is knowledgeable in the welding process and can provide ongoing future support for the robot system as your needs change. The vendor should support the total system.
- B. Select a robot that is designed for arc welding and has the appropriate software for your applications.
- C. Select a vendor that provides system training in the vendor's facilities and in your facilities.
- D. Select a robot size and type that will meet both your current and future requirements.
- E. Select a robot vendor that will guarantee your satisfaction with the robot system you purchase. Will the system do what you want it to do?
- F. Involve your welding department personnel in the selection process. This factor plus an adequate training program may be the critical success factors in your selection of a welding robot system.
- G. Select a vendor who can quickly provide spare parts and on-site service.
- H. Select a vendor who can provide the necessary safety equipment.
- I. Select a vendor based upon total system and support capability.

IV. COST JUSTIFICATION

In order to do a cost justification, it is necessary to collect the annual costs for various items as the part is being welded manually or semi-automatically. Work with your potential vendor to work out these costs. Your vendor should have your best interests in mind.

These costs include:

	Current	Robot	Savings
1. Cost of scrap, repair and rework			
2. Cost of welder training			
3. Cost of labor turnover			
4. Cost of shielding gas			
5. What is cycle time (floor-to-floor)?			
6. What is the fully burdened labor cost?			
7. Cost of filler metals (\$/lb.)			
8. Cost of floor space (\$/sq.ft.)			
9. Cost of safety products			
10. Cost of fume removal/ventilation			
11. Cost of inspection			
12. Other			
		Annual Savings	\$

Perform a similar cost analysis for each part to be welded robotically and project the total annual savings.

Part A Savings	\$
Part B Savings	\$
Part C Savings	\$
Part D Savings	\$
Part E Savings	\$
Total Annual Savings	\$
Cost of Installed Welding Robot System	\$

Payback Period =
 [Installed Welding Robot System Cost ÷ Total Annual Savings] X 12 = ____ months

Return on Investment =
 Total Annual Savings ÷ Installed Welding Robot System Cost = _____ %

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