

Using Dedicated Resistance Welders To Cut Costs

The need for lower cost production methods is not exclusive to high volume sheet metal fabricators. Unfortunately, many low volume fabricators have perceived multiple welders as costly and some resistance welder OEM's as oriented primarily to the needs of high volume automotive and appliance manufacturers. In reality, LORS Machinery can also respond to the needs of low and medium volume fabricators with affordable multiple gun welders.

EXAMPLES:

The manufacturers of Hollow Metal Doors and Frames felt the pressing demand from construction contractors who required greater quantities of these products and could not afford delivery delays. The door and frame manufacturers were already using the resistance welding process to weld hat section stiffeners to door panels. Those welds were made with the conventional single spot rocker arm type resistance welder. The average door required about 150 to 200 spot welds for the four hat stiffeners in each panel section with two panel sections needed per door. In order to make the 300 to 400 spot welds needed for each door, a minimum of ten minutes were required. The operator had to manually move the door which was subject to possible damage from handling. Due to the need for manual handling of a cumbersome workpiece, operator fatigue was a concern. To solve this problem,

cost effective in line multiple welders were developed where twenty or more welds could be made in one sequence. The time savings were notable. It took only two to three seconds for a line of welds, or total of 48 seconds of machine cycle time to make approximately 320 welds. In addition to reduced welding time, less handling was involved resulting in less operator fatigue and reduced damage to the panels. The multiple-gun Welder in [figure 1] is the typical of the type used for this application. It features Cascade Firing for minimal power demand, Series Weld Process for improved cosmetic results and gauging for ease of operator handling. This type of welder is easy to use, can be furnished for many types of flat assemblies and can be used by low volume fabricators.



FIGURE 1 - MODEL 616



FIGURE 2 - MODEL 771

The door manufacturers also spot welded hinge reinforcements and locks to their door sections using conventional rocker arm or press type spotwelders. Six or more welds were individually made on each hinge reinforcement bracket. Due to the close spacing of the welds, it was not practical to group two or more welds in a confined area. The welder OEM selected the resistance projection welding process as the solution to this problem. Six projections were formed onto the reinforcement and lock plates. These projections served to locate the welds permitting the use of a dual gun welder capable of welding three or more projections simultaneously with each gun. The special Hinge Reinforcement Welder [Figure 2] not only improved the rate of production, it also improved the cosmetic appearance of the welds and door which benefited from reduced handling.

By using integral mounted weld fixtures, the operator could work at an easier pace while maintaining higher productivity. This welder can be provided with controls featuring dual weld times and current selection. This permits the operator to weld both the hinge reinforcement and the lighter gauge lock plates with the same welder. Comparing the times needed to make six individual spot welds with a single head rocker arm machine and the time required by a Dual Gun dedicated welder making six projection welds in one sequence, the more efficient way to go is to select the special purpose Dual Gun welder.

Another door fabricating operation has benefited from the use of a dedicated multiple gun welder. End channels had been spotwelded to the top and bottom of door assemblies using standard rocker arm or press-type welders, requiring the operator to turn the door over. This operation was improved by the use of suspended portable gun stations in which the gun can be rotated 180° within its gyro-bail eliminating any need to turn over the door. The suspended portable gun stations could continue to be used for low volume production. The development of multiple gun end channel welders enabled metal door manufacturers to further increase their productivity and to improve the cosmetic appearance of the door skin as a result of greatly reduced weld marking. A basic six gun end channel welder as shown in [figure 3], is capable of meeting the needs of most production lines. Should greater production volume be required, LORS Machinery can provide models having more weld guns to make all welds on the end channel in one sequence.

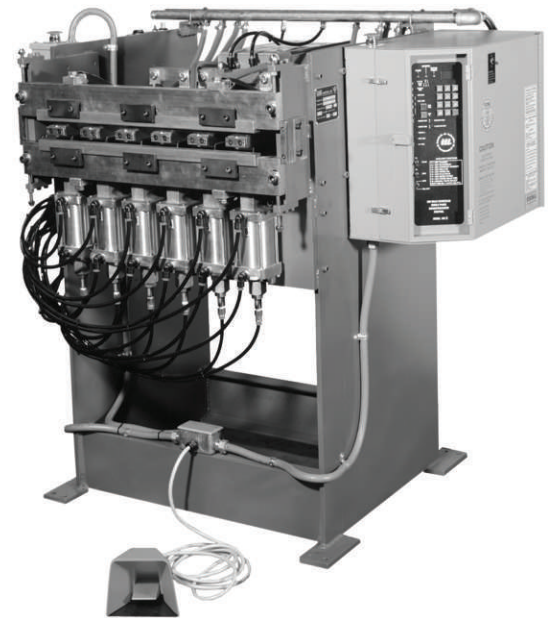


FIGURE 3 - MODEL 734

The Hollow Metal Door Industry was not alone in their need for better welding operations. Manufacturers of metal office furniture sought to increase their volume without sacrificing quality. The complex configurations of their products dictated a need for multiple-gun welder set up as lines where each station performed one welding operation and then transferred the workpiece to the next station. In [figure 4], you see a typical line of welders where sub-assemblies are joined to form a pedestal. These multiple gun welders employ the series weld process and integral weld fixturing to assure positive results. Another popular special purpose multiple gun welder used for joining components to produce a drawer body is illustrated in [figure 5]. This drawer welder replaced five standard rocker arm welders and significantly reduced time and labor costs for the furniture manufacturer. The integral fixturing provided positive location of components and dramatically reduced rejects. LORS Machinery offers a full range of cost effective multiple gun welders designed for the production of metal office furniture.

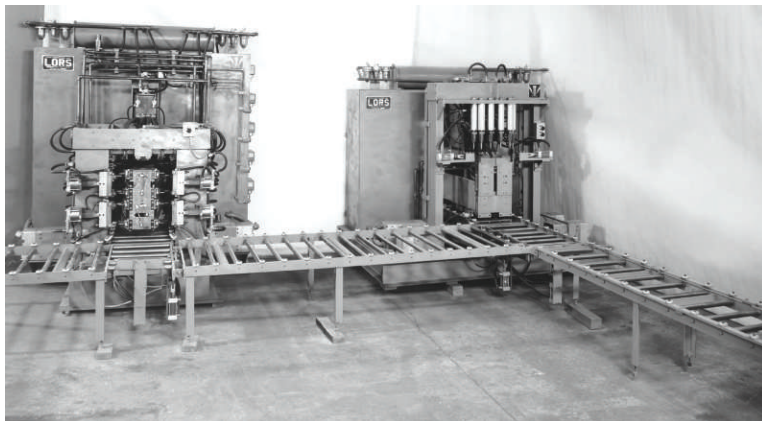


FIGURE 4 - CABINET WELDER

gang weld dies capable of making several cross wire welds simultaneously. Despite the time and labor savings of this method, die maintenance and primary power demand created problems for its users. A better solution was needed.

A third industry which has benefited from the use of dedicated Multiple Gun Resistance Welders is the Fabricated Wire Products Industry. The welding of wire racks and shelving required numerous hits with a conventional single head spot welder, a costly and time consuming operation. The wire fabricators quickly adopted large KVA rated Press or Projection type resistance welders fitted with long bar type



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The resistance welder OEM developed multiple gun welders to overcome the problems of increased power demand when making many welds and high die maintenance associated with gang welding. These welders could be furnished with Direct Weld, Push-Pull Weld or the Series-Weld process and with a cascade firing sequence or gun sequence. Both cascade firing and gun sequencing allow rapid welding with a reduced power demand on the plant's electrical service. In the cascade configuration, [figure 6] groups of welding guns are connected to separate transformers.

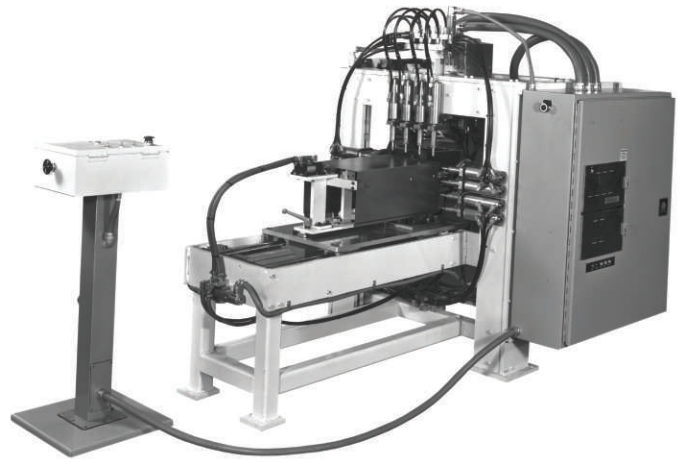


FIGURE 5 - DRAWER WELDER



FIGURE 6 - MODEL 633

Depending upon the number of weld heads and the workpiece to be welded, two or more welding transformers may be used, each connected to a group of guns. The welder controller initiates all weld heads to advance together against the workpiece. The controller then individually fires each transformer with its group of weld guns in rapid succession. By firing each transformer separately, total demand on the plant is kept to a minimum. Multi-gun sequencing as shown in [figure 7], differs in that, a single welding transformer can be used to fire different groups of weld guns. In this case the welder controller initiates only some of the weld heads which advance against the workpiece. The rest of the weld heads remain in the open or retract position, away from the workpiece. The controller then fires the transformer making welds. The first group of

weld heads advance then retract and another group advances and the weld process is repeated. Again, power demand is minimized. Although not as rapid as a cascade operation, multi-gun sequencing is fast and has found wide applications in the wire industry. Integral weld fixturing can usually be provided to simplify any weld tooling requirement. If higher production is needed, hopper feed of cross wire and automatic index systems can be furnished. Similar techniques are used in the wire industry with the Wire Mesh Welders.

We have briefly outlined three industries that have achieved greater productivity and cut welding costs with multiple gun resistance welders. There are many other fabricators who can benefit from such equipment. However, in order to realize a maximum return on your investment, a careful study must be made of your needs. This should be accomplished by conferring with LORS Machinery to evaluate your current methods and requirements so that a proper recommendation can be made.



FIGURE 7 - MODEL 641



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Before contacting LORS Machinery, you should collect the following information:

- A. Production requirement
- B. All engineering data such as material type and thickness, range of product sizes and/or styles and dimensional requirements.
- C. The number of personnel available for the application.
- D. Degree of indexing, feeding or automation required.
- E. Is the product design firm or can it be modified?
- F. Establish a budget.

An accurate assessment of your needs will avoid unnecessary overkill. Do your homework, then contact LORS and work with us. LORS' experience in solving welding production problems for other firms, perhaps in your industry, can assure that the special purpose resistance welder you get is the most suitable for your needs and will provide the expected return on your investment.

TO CALCULATE THE APPROXIMATE COST PER WELD...

$$\text{KVA DEMAND} = [\text{SECONDARY VOLTAGE}] \times [\text{SECONDARY CURRENT}]$$

$$\text{KW DEMAND} = [\text{KVA}] \times [\text{POWER FACTOR}]^*$$

* USE A POWER FACTOR OF .4 or .5

$$\text{ON TIME} = \frac{\text{CYCLES ON}}{216,000 \text{ cycles/hour}}$$

$$\text{COST PER SPOT} = [\text{KW DEMAND (KWH)}] \times [\text{ON TIME}] \times [\text{KWH POWER COST}]$$

$$\text{COST PER HOUR} = [\text{COST PER SPOT}] \times [\text{\# OF SPOTS PER HOUR}]$$



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