

Duo-Corp., North Lima

Intervention keywords: Automatic Screw Feeding System, In-line Pneumatic Guns, Pistol Grip Guns, Aro Parallel Arm Workstations

Industry: Manufacturing

Risk Factor(s): Awkward Posture-wrist deviation, High Hand Force-pinching/gripping, Repetitive motion, Vibration-hand/arm

Situation:

Duo-Corp. is a vinyl basement and utility window manufacturer, for both new construction and replacement applications, within the concrete block and poured wall foundation markets. Duo-Corp operates 3 production lines with nearly 1,000 windows manufactured per day. Many of the tasks performed by workers, such as Fastening of Jamb Track to Window Jamb (Figure A), Fastening of Sash Hinge to the Sash Frame (Figure B), and Fastening of Sill to the Welded Main Frame (Figure C), require the worker to repeatedly pick up screws, line them up to the end of a screw gun, and drive screws into the respective parts. This is done while holding the part in place, and by pointing the screw gun in the appropriate direction (gun weighs 2lbs.). One employee fastens nearly 2,000 screws a day continuously for an eight hour shift. There is a risk of injury to the hand, wrist, elbow and shoulder, due to the awkward postures and strains these jobs present. The repetitive motions that are required of the employees further elevate the risk factors for Cumulative Trauma Disorders and resulting injuries.



Figure A



Figure B



Figure C

Solution:

Duo-Corp. addressed the problem by purchasing and installing 3 DTI 5000 Automatic Screw Feeding Systems with 2 In-Line pneumatic guns, 1 pistol-gripped gun, and 2 Aro Parallel Arm Workstations (Figures D-F). These improvements were to eliminate the repeated picking up, holding, and positioning of nearly 6,500 screws per day, or nearly 1.5 million screws per year. They

would also serve to reduce employee strain when holding up the 2lb. gun. Finally, the intervention would serve to correct the awkward positions and grips required by the old system. The in-line tool reduces force by the employee, by reducing the amount of pressure needed by the employee to operate the gun. The total cost of the intervention was \$23,340. Duo-Corp. received \$18,672 in assistance from Safety Grants to offset the costs.



Figure D



Figure E



Figure F

Results:

- CTD Risk Factor Scores decreased 32% following the intervention.
- CTD, Lost Days, and Restricted Days were at 0 the year prior to the intervention, and remained at 0 after the intervention.
- There were 0 Claims one year prior to the intervention, which remained at 0 after the intervention.
- Employee Turnover Rates increased 290% per 200,000 hours worked, from 175 to 509.
- Productivity, reported by the company, was at 25 windows manufactured per hour on the Aristoclass line, and 50 an hour on the Competitor line. With the intervention, productivity increased to 50 windows per hour for the Aristoclass line, and 55 per hour for the Competitor line.
- Quality improved from producing 10% scrap to less than 1%.