

### **CASE STUDY - LEE SPRING COMPANY**

#### About:

Lee Spring is a manufacturer and distributor of mechanical springs, wire forms and related products. They produce tens of thousands of different spring designs, both for their catalog and for custom applications.

Employees: 300 (85 in NYC)

Website: www.leespring.com

**Location:** Brooklyn Army Terminal, Brooklyn, NY

#### **KEY IMPACTS**



REDUCTION IN COGS -AUTOMATED PRODUCTION LINE

**100%** INCREASE IN OPERATOR EFFICIENCY



볼/EDC 💮 itac

LEE SPRING'S OPS21 GRANT SUPPORTED THE INTEGRATION OF ROBOTICS, VISION SYSTEMS AND ADDITIVE MANUFACTURING INTO THEIR OPERATIONS TO EXPAND THE OUTPUT CAPACITY OF THEIR NEW YORK PLANT. THROUGH THE INTRODUCTION OF A COBOT, LEE SPRING WAS ABLE TO IMPLEMENT ROBOTICS INTO PRODUCTION RUNS FOR LOWER VOLUME ORDERS IN A COST EFFECTIVE WAY.

#### **GRANT TECHNOLOGY AREA:** Robotics/Automation

#### **CHALLENGE / OPPORTUNITY**

Prior to this project, Lee Spring had knowledge of traditional industrial automation in the spring industry, and in fact produces in-house their own lines for automated spring production. However, these automation methods are slow to setup and break down, and are expensive. Also, they are not easily adapted to spring designs other than the design the line was set up for. This means that these methods are only used for very high volume production, and as a result, shorter volume runs are relegated to hand operations.

#### SOLUTION

Lee Spring invested in a newer generation robot, know as a "cobot", as it has the ability to be integrated easily into existing processes without costly and restrictive safety barriers – the cobot ceases movement when it encounters an obstruction, making it safe to work around. The cobot is more adaptable, making changeovers to other spring geometries quicker, due to its versatile programming and its ability to integrate with components such as 3D printed fixtures (for handling springs), vision systems (laser scanners/ sensors), and conveyors. The cobot provides an adaptable, flexible solution that is cost effective for shorter volumen runs.



The Ops21 grant project gave Lee Spring the opportunity to accelerate the integration of new technologies into our production line. I enjoyed developing our ideas and watching them take shape and come to life.

Christian Chavez, Process Improvement Engineer, Lee Spring

# **RESULTS & INSIGHTS**



#### **JOB CREATION**

- 1 full-time equivalent (FTE) job created.
- Expanded opportunities for their workforce to learn valuable new skills (e.g. coding, sensory/ system integration) as well as increased safety and workforce morale through the elimination of repetitive manual tasks.



#### **COST SAVINGS**

- Demonstrated an 8-12% reduction in COGS on the automated production line as a result of a 23-29% reduction in labor due to the robotic cell.
- Increased operator efficiency by 100% as one operator can now oversee two production lines (one manual and one robotic).



#### **INCREASED EFFICIENCY**

• Expanded capacity as the robotic cell can continue to operate between shifts, during times that were previously downtime for the entire factory.



#### **INCREASED SALES**

• Improved efficiency, productivity and utilization are expected to substantially impact sales as more robotic cells are introduced into operations.



### **IMPROVED COMPETITIVENESS**

• Reduced costs resulting from robotic implementation for shorter run springs will enable Lee Spring to increase its competitiveness.



The 3D printed jaws dropping an unground spring into the grinding machine.



Integration of laser sensors, encoders, the UR3e robot, and a traditional spring end grinding machine.

# Ultimaker

## **OPS21 PROGRAM OVERVIEW**

Ops21 is a multi-faceted program designed to help NYC manufacturers learn about and adopt advanced technologies, specifically advanced materials, robotics, and digital manufacturing. It is part of the greater Futureworks NYC initiative, which aims to help manufacturers embrace advanced technologies and increase local production.

Ops21 Grant funds are generously provided via the Futureworks NYC Ops21 program, which is funded by the New York City Economic Development Corporation (NYCEDC) and led by the New York City Industrial and Technology Assistance Corporation (ITAC).



Additive manufacturing allows Lee Spring to custom-make gripper jaws on their Ultimaker 3D printer.