



Cast Iron Engine Block Modification Using SST Cold Spray

Background

At an engine machining facility it was discovered that the Cam Bearing Mounting Pads on a large cast iron engine were out of specification due to a machining error that occurred during the manufacturing process. The manufacturer needed a solution to correct this error and salvage the expensive engine block.

The Problem

The initial repair options were to either weld or thermally spray the mounting pads. However, the manufacturer rejected both approaches, since these processes have the major disadvantage of introducing thermal energy into the engine block, distorting the previously machined surfaces and compromising the tolerances.

It was decided that the repair process must

- not compromise the existing material properties,
- be capable of effecting spot repair (i.e., the process could be easily applied only to areas that required repair), and
- provide a final post-repair surface composition that could be machined to specifications.

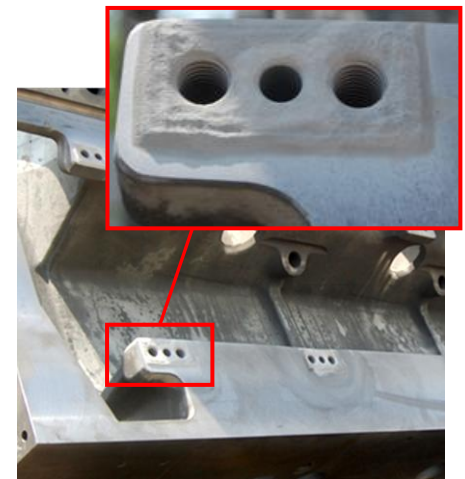


The Solution

The customer selected CenterLine's SST™ Cold Spray process for this repair. CenterLine's SST-N0056 powder, a general nickel-based mixture of nickel, aluminum, zinc, and alumina was sprayed using an SST Series P Portable Spray Machine, equipped with a Manual Spray Gun and standard nozzle. The parameters of the process were 120 psi air pressure and 550°C nozzle temperature.

The repair was performed at CenterLine without the need to unload the engine block from the delivery truck, thus saving time and costs. A steel template was used during spraying to keep the spray pattern consistent in size and shape.

To bring the cold sprayed Cam Bearing Mounting Pads to the specified height, the final sprayed surface was machined in the same manner as the original parent material, using the customer's standard machining practices.



Customer Benefits

The customer was extremely pleased with the final result of this application since the repair did not introduce component distortions, and the part could be finished using standard machining practices.

The SST Cold Spray process saved the customer thousands of dollars by fully recovering the entire large engine casting.

If you require more information about this project, please contact CenterLine, the SST Division.