

# LOW-TEMPERATURE HEAT TREAT EXTENDS BROACH LIFE MORE THAN 60 TIMES

Even though the broach still met the original spec, many of the cast-iron pump parts had to be scrapped after processing.

The thin walls of this ductile iron hydraulic pump were collapsing after broaching only 20 pieces, even though the broach was the original correct size. Omar Simon, an engineer at the Circle Broach Co. needed to find a unique solution for this particularly troublesome problem.

He decided to try a surface treatment on the broach to add lubricity and maintain the sharp cutting edge and corners while it was being used on the pump. Based on his past experience with other broaching applications, he specified DYNA-BLUE ferritic nitrocarburizing

processing to tackle the problem.

The process succeeded in increasing tool life from 20 pieces to more than 1200 pieces before the broach needed resharping. Simon also noted that, unlike titanium nitride and other coating processes, recoating the broach after resharping wasn't necessary. The improved wear resistance of the tool lasted through as many as four or five sharpenings.

#### More Than Just a Coating

DYNA-BLUE is a combination process involving a fluidized bed furnace for temperature uniformity and rapid heat and atmosphere transfer. It is two to three times faster than a conventional gas-atmosphere furnace for ferritic nitrocarburizing and steam bluing. The process results in diffusional addition

of carbon and nitrogen into the treated part's metal surface, creating a 70+ HRC (equivalent) compound zone.

This makes the treated surface wear- and corrosion-resistant, with added anti-galling and anti-sticking properties as well. The steam bluing also enables the surface to retain lubricants during use, maintains a cooler cutting edge and provides a lower coefficient of friction.

Because this is a low-temperature process, the treatment also provides good dimensional control and minimal part distortion. This makes it the process of choice for a number of cutting tool, stamping, die-casting and mold applications for food-processing, machine and automotive components. **Dynamic Metal Treating, Inc.**

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