

DYNA-BLUE Fluidized Bed Ferritic Nitrocarburizing for production components

THIS PRESENTATION WILL EXPLORE THE BENEFITS OF:

- FLUIDIZED BED PROCESSING.
- DYNA-BLUE FERRITIC NITROCARBURIZING



What is **DYNA-BLUE®**?

DYNA-BLUE is a low temperature, (typically 950° – 1150 ° F), thermal-chemical diffusion process that yields two metallurgical characteristics:

1) Epsilon Iron Carbonitride Compound layer that is composed of Nitrogen & Carbon and has a hardness of up to 75HRC. The layer can be produced from .0001" – .002" depending upon the application and properties needed.

2) A nitrogen enriched diffusion zone 60+ HRC that supports the compound zone. This layer can be produced from .001" to greater than .015".

DYNA-BLUE Ferritic Nitrocarburizing Microstructure



The picture shows .0006"-.0007" compound (white) layer supported by a nitrogen rich diffusion zone.

DYNA-BLUE Microstructure



Fluidized Bed Furnaces

Fluidization is the term applied when making aluminum oxide or sand particles react like a liquid in a heat treating furnace. Process gases are introduced to the furnace through a diffusion plate, located in the bottom of the furnace. The gases are pressurized thus lifting and moving the sand scrubbing the part with fresh reactive gases and provides uniform heating \pm 2°F, thereby ensuring consistent metallurgical properties with 6 times the thermal transfer of an atmosphere controlled furnace. The process is not inhibited by part geometry or blind holes and maintains finish.

FNC & Duplex Surface Treatments



Production Components







GM Specification 24216886

- 1. Compound layer thickness 0.013mm (0.005 inches minimum
- 2. Continuous surface porosity (compound layer)shall penetrate no greater than 50% of the compound layer thickness. Any porosity forming a lateral line is unacceptable.
- 3. Diffusion Zone Depth 0.015mm Minimum

Ferritic Nitrocarburizing Specs

DYNA-BLUE Ferritic Nitrocarburizing meets or exceeds the following specifications:

AMS 2757B GM TPH-AA001, 24216886 Chrysler PS-4TN Ford Spec for Nitrocarburizing Meritor Spec 343-B Allied Spec BW-265p Caterpillar Spec 1E0548





Corrosion Resistance

Test Type: Salt Fog (MIL-STD-810G 509.5)

Test Procedure/Preparation

The test specimens were placed in a salt fog chamber set at $35\pm2^{\circ}$ C with a salt concentration of 5% for 24 hours. After the first 24 hours, the specimens were removed and dried at room temperature for 24 hours. The process was repeated(24 hours of salt followed by 24 hours at room temperature).



M11779 Dynablue w/ NITROWEAR 1 • No rust observed.

Benefits of DYNA-BLUE ®

1- Produces hard wear resistant compound layer .0001"-.002" with no brittleness

- 2- Low temperature prevents distortion-reduces scrap
- 3- Uniformity of process, penetrates holes, bores
- 4-Increased Yield, Tensile and Fatigue strength
- 5- Increased corrosion resistance-over 96 hours salt spray reisitance
- 6- Increased lubricity-reduces coefficient of friction
- 7- Low dimensional variation, less than .0002" (.005 mm) growth.
- 8-High wear resistance 70+ HRC surface