## U.S. Government Saves Money, Improves Quality with Meta-Lax®

The U.S. Army, Navy, Air Force, and NASA rely on META-LAX® stress relief to save money and improve quality in making many of the highest quality parts in the world.

### The Process

Meta-Lax is a patented sub-harmonic vibratory stress relief process that is applied before machining or grinding to prevent distortion in metal parts making it easier to achieve ultra close tolerances. According to the U.S. Department of Energy, "Meta-Lax is a proven substitute for 80-90% of the heat treatment stress relief applications." Furthermore, Meta-Lax processing can be used during welding to prevent weld distortion and cracking thereby improving the quality and longevity of the weldment.

### The Recommendation

Bonal recommends one or more of the following:

- 1. Apply Meta-Lax stress relief before any machining step to prevent distortion.
- 2. Apply Meta-Lax stress relief periodically to maximize longevity.
- 3. Apply Meta-Lax during welding to prevent weld distortion and weld cracking.
- 4. Apply Meta-Lax during welding to increase service life.

### The Benefits

- 1. Eliminate up to 95% the time and costs for stress relief.
- 2. Prevent up to 84% the distortion following machining.
- 3. Prevent up to 93% the distortion from welding.
- 4. Increase up to 200% the service life.
- 5. Save up to 98% of the energy consumption and carbon emissions.

### U.S. Army - Watervliet Arsenal



120 Mortars

"The results were outstanding. We saw our scrap rate go from 50% to zero and stay there."

### U.S. Navy - Pearl Harbor



Fairwater Plane.

"The Indy's fairwater was chosen because it had been welded several times only to have cracked each time. Using the 'Meta-Lax' process the weld held without cracking!"

### **NASA - Langley Research Center**



Wind Tunnel Frame.

"I think of Meta-Lax as an extra trick up my sleeve for a higher quality product."

NASA - Dryden Flight Research Center



Transport Mount for ISS Lifeboat.

"By using Meta-Lax weld conditioning, the program went quite smoothly even though it took over 30 days to weld."



### **Current Use of Meta-Lax® on Government Jobs**



Launch Sequencer



**Guidance Missile Platform** 



Deep Space Telescope Housing



U.S. Navy Crane Boom



Bulkhead Dam Gate

### **Partial List**

### NASA

Space Shuttle Nose Cone
Space Shuttle Rocket Booster Forgings
Space Shuttle Landing Gears
Space Shuttle Wheels
Space Station Life Boat Mount
Galileo Space Probe Battery Cells
Cruise Missile Housings
Hubble Space Telescope Components
Fresnel Lens System
Camera Mounts for Satellites
Cooling Chamber for Satellites

### U.S. Army

120 mm Mortars Rock and Diggers 120 mm Gun Mount Cradles 155 mm Howitzer Muzzle Brakes A-Frame for Munitions Transport Body Buffers

### U.S. Navy

**Torpedo Trays for Submarines** Water Jackets for Submarines Fairwater Planes for Submarines **Guidance Gyros for Submarines** Catapult Launchers for Aircraft Carriers Aircraft Elevators for Aircraft Carriers Jet Blast Deflectors for Aircraft Carriers Track Channels for Aircraft Carriers Cargo Boom for Ship Torque Tube for Ship Tail Shaft for Ship Mine Sweeper Components Water Brake Cylinders Launch Valve Cylinders Coast Guard Ice Breakers Primary Engine Foundations

### **U.S. Air Force**

Longeron
Wing Flaps
F/A-18 Gun Handling Adapters
F/A-18 Landing Gears
A-10 Warthog Landing Gears
KC-135 Engine Trailers
Apache Helicopter Cockpit Frame
Attitude Control System

Mine-Hunter Components



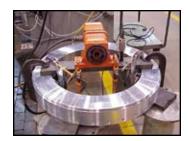
# **Opportunity**



Missile Housings



Aircraft Elevator Support



Telescope Seal



**Bonding Fixture** 



Longeron

The U.S. Army, Navy, Air Force and NASA rely on Meta-Lax® to Save Money and Improve Quality.
YOU SHOULD TOO!

Contact Bonal Technologies, at 1-800-638-2529

