Section 3. MOLECULAR METAL

INTRODUCTION

The first part of this section contains general information about the uses, procedures, and characteristics of the Atomized Metal Repair Compound (M-41) used by the Department of Navy. The remainder of this section covers a more specific description of molecular metal, its uses, and usefulness.

ATOMIZED METALLIC MATERIALS KIT

NSN: 8030-01-232-1246

COMPONENTS:

CODE		
M-41	* 2 Units	Alloy GP Metal
M-42	* 1 Unit	Smoothcoat Metal
M-43	* 1 Unit	Smoothcoat Liquid Metal
M-44	* 1 Unit	Rapid Metal
M-50	18 oz.	Nobond Release Agent
M-5 1	1 Pint	Cleaner/Degreaser
M-52	** 1 each	Reinforcing Bandage
	2 each	Instruction Sheets
	2 each	Spatulas

* Unit = approximately 2 lbs.
** 216 square inches

This kit consists of atomized metallic materials, chemical aids and accessories for the repairs and overlays of most metals with a minimum of effort and technique. This kit costs $389.00.

ATOMIZED METAL REPAIR COMPOUND

(M-4l)

ALLOY GP:

A general purpose compound for patching, falling and bonding, and ideal for in-place repairs. Its dimensional stability allows casting to exact tolerances without machining. For example, restoring oversized bearing housings without reboring. Simply clean I.D. of housing, apply ALLOY GP close to size and insert into housing after coating proper size bearing with Nobond. Remove excess compound and allow deposit to harden.

APPLICATIONS:

Keyways Shafts Damaged Castings Hydraulic Rams Engine Blocks Gear Housings

PROPERTIES:

Coverage per one (1) unit container --------15 cubic inches
Strength begins to diminish after prolonged
exposure to temperatures over ----------225°F
Color of hardened deposits ---------- Dark Gray
Consistency of mixed compound ---------- Putty

DIRECTIONS FOR USE

1) See general information.
2) Mix reactor (R) into Base Alloy (A) in ratios:
   By Volume -1 part A to 1 part R
   By Weight -2 1/2 parts A to 1 part R
3) Working time is approximately 25 minutes at room temperature.
4) Deposits reach handling strength in 4 to 8 hours.
5) 100% strength is attained in 16 to 24 hours.

NOTE: SURFACES TO BE BONDED MUST BE ABSOLUTELY CLEAN AND FREE OF OIL FILM OR MIST. USE CAUTION IN SELECTING CLEANING SOLVENTS. COMPRESSED AIR USED FOR DRYING MAY CONTAIN OIL OR MOISTURE.

GENERAL INFORMATION

For maximum bonding, prepare areas to be repaired by grit blasting, machining or abrading. Clean with M-5 1 Cleaner Conditioner. Be sure areas being bonded are dry and free from moisture. Bonding and hardening are enhanced when metal surfaces are above 75 oF. In cold environments, heat parts with a flame, heat lamp or forced hot air. Be sure flame sources do not leave carbon or other deposits.

Mix Base Alloys and matching reactors to specified ratios. Variances may cause failures. Mix thoroughly until smooth lump-free consistency is achieved. Completed mix should be an even color, without streaks.

Small quantities (1 unit or less) are easily mixed by hand for 2 to 5 minutes. Large quantities should be mixed with a power paddle. A large mass will cure faster and working time is reduced. When ambient temperature or temperature of surface is below 60°F, compounds will not achieve full strength. Low temperatures may inhibit hardening. Heat deposit and part being repaired with indirect heat (lamp or warm air) to room temperature. In general, deposits harden faster when parts and deposit are heated. CAUTION: DO NOT EXPOSE DEPOSITS DIRECTLY TO FLAME.

Smooth finishes can be obtained by placing a sheet of polyethylene or waxed paper over soft deposits. Remove when hardened. Trowels or spreading tools can be moistened with water between strokes for smoother deposits when applying.

Use M-50 Nobond Wax on surfaces not to be bonded. For detailed reproductions from molds and patterns apply Nobond in several coats. Allow each coat to dry then buff before applying additional coats. Brush a thin coat of compound on mold surfaces before casting the remainder of the mix.

Use reinforcing screens and tapes to minimize warpage and to increase overall strength. When casting large, deep shapes, pour compounds in several steps, allowing prior deposits to semi-harden and cool before adding additional compound.

ATOMIZED METAL REPAIR COMPOUND

(M-42)

SMOOTHCOAT

This unique alloy provides self-lubricating properties and is used to repair and protect components that have lost dimension from rubbing, sliding, galling or other frictional wear problems. Coated areas are dry, yet permanently lubricated throughout the deposit thickness. Use SMOOTHCOAT to restore and create new bearing surfaces.

APPLICATIONS:

Shafts Bearing Housings Bushings Wear Pads Slides Guides Machine Ways Pipe supports Axles Pistons Cam Followers Cams.

PROPERTIES:

Coverage per one (1) unit container --------21 cubic inches
Strength begins to diminish when exposed to
service temperature exceeding ----------250°F
Color of hardened deposits --------------Dark Gray
Consistency of mixed compound ----------Putty

DIRECTIONS FOR USE:

1) See general information.
2) Mix reactor (R) into Base Alloy (A) in ratios:
   By Volume -1 part A to 1 part R
   By Weight -4 parts A to 3 parts R
3) Working time is approximately 30 minutes at room temperature.
4) Deposits reach handling strength in 4 to 8 hours.
5) 100% strength is attained in 16 to 24 hours.

NOTE: SURFACES TO BE BONDED MUST BE ABSOLUTELY CLEAN AND FREE OF OIL FILM OR MIST. USE CAUTION IN SELECTING CLEANING SOLVENTS. COMPRESSED AIR USED FOR DRYING MAY CONTAIN OIL OR MOISTURE.

GENERAL INFORMATION

For maximum bonding, prepare areas to be repaired by grit blasting, machining or abrading. Clean with M-5 1 Cleaner Conditioner. Be sure areas being bonded are dry and free from moisture. Bonding and hardening are enhanced when metal surfaces are above 75°F. In cold environments, heat parts with a flame, heat lamp or forced hot air. Be sure flame sources do not leave carbon or other deposits.

Mix Base Alloys and matching reactors to specified ratios. Variances may cause failures. Mix thoroughly until a smooth, lump-free consistency is achieved. Completed mix should be an even color, without streaks.

Small quantities (1 unit or less) are easily mixed by hand for 2 to 5 minutes. Large quantities should be mixed with a power paddle. A large mass will cure faster and working time is reduced. When ambient temperature or temperature of surface is below 60°F, compounds will not achieve full strength. Low temperatures may inhibit hardening. Heat deposit and part being repaired with indirect heat (lamp or warm air) to room temperature. In general, deposits harden faster when parts and deposit are heated. CAUTION: DO NOT EXPOSE DEPOSITS DIRECTLY TO FLAME.

Smooth finishes can be obtained by placing a sheet of polyethylene or waxed paper over soft deposits. Remove when hardened. Trowels or spreading tools can be moistened with water between strokes for smoother deposits when applying.

Use M-50 Nobond Wax on surfaces not to be bonded. For detailed reproductions from molds and patterns apply Nobond in several coats. Allow each coat to dry then buff before applying additional coats. Brush a thin coat of compound on mold surfaces before casting the remainder of the mix.

Use reinforcing screens and tapes to minimize warpage and to increase overall strength. When casting large, deep shapes, pour compounds in several steps, allowing prior deposits to semi-harden and cool before adding additional compound.

ATOMIZED METAL REPAIR COMPOUND

(M-43)

SMOOTHCOAT LIQUID:

This is a lower viscosity compound that can either be brushed on or poured on. Deposits exhibit exceptional anti-friction properties. Deposits are self-leveling and smooth as applied. This formulation makes it ideal for fabricating holding fixtures and machining jigs as parts being held will not mar or scratch. When SMOOTHCOAT LIQUID is used to cast fixtures or patterns, detail is held to exacting tolerances. SMOOTHCOAT LIQUID is ideal for forming irregular bearing surfaces.

APPLICATIONS:

Anti-Friction Surfacing of all Metal Components.
Creates Bushing and Bearings without dismantling machinery.
Fabricate easy to strip Molds and Patterns.

PROPERTIES

Coverage per one (1) unit container --------19 cubic inches
Strength begins to diminish when exposed to
service temperature exceeding ----------250°F
Color of hardened deposits --------------Dark Gray
Consistency of mixed compound ----------Putty

DIRECTIONS FOR USE:

1) See general information.
2) Mix reactor (R) into Base Alloy (A) in ratios:
By Volume -2 parts A to 1 part R
By Weight -4 parts A to 1 part R
3) Working time is approximately 30 minutes at room temperature.
4) Deposits reach handling strength in 4 to 8 hours.
5) 100% strength is attained in 16 to 24 hours.

NOTE: SURFACES TO BE BONDED MUST BE ABSOLUTELY CLEAN AND FREE OF OIL FILM OR MIST. USE CAUTION IN SELECTING CLEANING SOLVENTS. COMPRESSED AIR USED FOR DRYING MAY CONTAIN OIL OR MOISTURE.

GENERAL INFORMATION:

For maximum bonding, prepare areas to be repaired by grit blasting, machining or abrading. Clean with M-5 1 Cleaner Conditioner. Be sure areas being bonded are dry and free from moisture. Bonding and hardening are enhanced when metal surfaces are above 75°F. In cold environments, heat parts with a flame, heat lamp or forced hot air. Be sure flame sources do not leave carbon or other deposits.

Mix Base Alloys and matching reactors to specified ratios. Variances may cause failures. Mix thoroughly until a smooth, lump-free consistency is achieved. Completed mix should be an even color, without streaks.

Small quantities (1 unit or less) are easily mixed by hand for 2 to 5 minutes. Large quantities should be mixed with a power paddle. A large mass will cure faster and working time is reduced. When ambient temperature or temperature of surface is below (60°F, compounds will not achieve full strength. Low temperatures may inhibit hardening. Heat deposit and part being repaired with indirect heat (lamp or warm air) to room temperature. In general, deposits harden faster when parts and deposit are heated. CAUTION: DO NOT EXPOSE DEPOSITS DIRECTLY TO FLAME.

Smooth finishes can be obtained by placing a sheet of polyethylene or waxed paper over soft deposits. Remove when hardened. Trowels or spreading tools can be moistened with water between strokes for smoother deposits when applying.

Use M-50 Nobond Wax on surfaces not to be bonded. For detailed reproductions from molds and patterns apply Nobond in several coats. Allow each coat to dry then buff before applying additional coats. Brush a thin coat of compound on mold surfaces before casting the remainder of the mix.

ATOMIZED METAL REPAIR COMPOUND

(M-43)

RAPIDSTEEL

This Rapid Hardening Compound is ideal for emergency repairs. It will form water-tight seals on copper, aluminum, steel or any material used for fluid piping and storage. Even the most severely corroded pipes can be restored to better than new condition. To repair large areas or badly damaged sections , apply a thing coating of RAPIDSTEEL directly to surfaces, then wrap tightly with reinforcing bandage (available in various sizes). Apply a cover coat of compound and spread to desired shape.

APPLICATIONS:

Tanks Vessels Radiators Condensor Coils Fuel Tanks Plumbing Pipes and Fixtures Foundations and Retaining Walls.
For leveling pads under machine bases.

PROPERTIES

Coverage per one (1) unit container --------14 cubic inches
Strength begins to diminish when exposed to
temperatures over ----------225°F
Color of hardened deposits ----------Dark Gray
Consistency of mixed compound ----------Putty

DIRECTIONS FOR USE.

1) See general information.
2) Mix reactor (R) into Base Alloy (A) in ratios:
By Volume -1 part A to 1 part R
By Weight -2 parts A to 1 part R
3) Working time after mixing is approximately 2 to 5 minutes at 70°0F.
4) Deposits reach handling strength in 10 to 20 minutes.
5) 100% strength is attained in 8 to 12 hours.

NOTE: SURFACES TO BE BONDED MUST BE ABSOLUTELY CLEAN AND FREE OF OIL FILM OR MIST. USE CAUTION IN SELECTING CLEANING SOLVENTS. COMPRESSED AIR USED FOR DRYING MAY CONTAIN OIL OR MOISTURE.

GENERAL INFORMATION.

For maximum bonding, prepare areas to be repaired by grit blasting, machining or abrading. Clean with M-51 Cleaner Conditioner. Be sure areas being bonded are dry and free from moisture. Bonding and hardening are enhanced when metal surfaces are above 75°F, In cold environments, heat parts with a flame, heat lamp or forced hot air. Be sure flame sources do not leave carbon or other deposits.

Mix Base Alloys and matching reactors to specified ratios. Variances may cause failures. Mix thoroughly until a smooth, lump-free consistency is achieved. Completed mix should be an even color, without streaks.

Small quantities (1 unit or less) are easily mixed by hand for 2 to 5 minutes. Large quantities should be mixed with a power paddle. A large mass will cure faster and working time is reduced. When ambient temperature or temperature of surface is below 60°F, compounds will not achieve full strength. Low temperatures may inhibit hardening. Heat deposit and part being repaired with indirect heat (lamp or warm air) to room temperature. In general, deposits harden faster when parts and deposit are heated. CAUTION: DO NOT EXPOSE DEPOSITS DIRECTLY TO FLAME.

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Use M-50 Nobond Wax on surfaces not to be bonded. For detailed reproductions from molds and patterns apply Nobond in several coats. Allow each coat to dry then buff before applying additional coats. Brush a thin coat of compound on mold surfaces before casting the remainder of the mix.

Use reinforcing screens and tapes to minimize warpage and to increase overall strength. When casting large, deep shapes, pour compounds in several steps, allowing prior deposits to semi-harden and cool before adding additional compound.