



CAUTION: Federal Law restricts this device to sale by or on the order of a properly licensed practitioner.

SEE
BACK PAGES
FOR MSDS INFORMATION
(All ingredients listed on MSDS sheets)

Parkell, Inc.
Instructions for use
C&B-METABOND® ADHESIVE CEMENT

DEVICE DESCRIPTION:

An adhesive cement that bonds to tooth structure, metals, resins and (when used with Parkell's Etch-Free porcelain liner) unetched ceramic surfaces.

INTENDED USE/INDICATIONS:

Cementation of low-retention cast crowns, inlays, onlays, endodontic posts, and resin-bonded bridges ... emergency reattachment of fractured teeth ... repairs of porcelain popoffs ... adhesive pulp caps of small exposures.

CONTRAINDICATIONS:

Not for use on or by persons who have a methacrylate sensitivity.

PRECAUTIONS:

Caution: Do not use C&B-Metabond® on surfaces that have been contaminated with eugenol (ZOE, etc.) as it will inhibit setting.

Caution: Prior application of Pain-Free, varnishes or liners (copal varnish, Ca(OH)₂ or glass ionomer) is not recommended, as it will reduce or prevent adhesion.

Caution: Do not mix the adhesive while it is warm. C&B-Metabond begins setting rapidly. To prevent premature setting, always mix in the chilled porcelain dish.

Caution: Prevent contamination of surfaces being bonded. Whenever possible, use a rubber dam.

INDIVIDUALIZATION OF TREATMENT:

C&B-Metabond creates extremely high bond strengths that make recovery of the restoration difficult. It should not be used for cementing any restoration where there is a likelihood that removal will be necessary.

CONFORMANCE TO STANDARDS:

Parkell's quality system is certified to ISO 9001/ISO 13485.

HOW SUPPLIED:

C&B-Metabond® may be purchased as a kit or individual components

- **C&B-Metabond Kit** - Stock No. S380
Contains Enamel Etchant, 2 Dentin

Activators (liquid & gel), Clear Powder, Radiopaque Tooth-Shade Powder, C&B-Metabond Quick Base, Universal Catalyst and Ceramic Mixing Dish with thermometer.

Components (cap color):

- **Enamel Etchant (White)** - Stock No. S395 (5ml)
- **Dentin Activator Liquid (Green)** - Stock No. S393 (5ml)
- **Dentin Activator Gel (Brown)** - Stock No. S394
- **Clear L-Powder (Violet)** - Stock No. S399 (3g)
- **Radiopaque Tooth-Shade L-Powder (Green)** - Stock No. S396 (3g)
- **C&B-Metabond Quick Base (Blue)** - Stock No. S398 (10ml)
- **Catalyst Gold Label** - Stock No. S371 (0.7ml)

Purchase Separately

- **Etch-Free Kit** - Stock No. S390 (Proven effective with Parkell's C&B-Metabond and TotalBond cements). Contains Etch-Free Base and Catalyst. An adhesive primer that allows C&B-Metabond to adhere directly to unetched ceramic surfaces. Eliminates the need for hydrofluoric acid.

- **MTL-V Primer** - Stock No. S413 (Proven effective with Parkell's C&B-Metabond and TotalBond cements). An adhesive primer that improves the stability of the bond to high-noble alloys in demanding applications. Eliminates need to tin-plate.

- **Blu-Sep** - Stock No. S385 A brush-on separating film that prevents C&B-Metabond and TotalBond from bonding to the exterior of the crown, adjacent teeth, gingiva, etc. Water-soluble so it can be washed off after use. Easily visible blue color.

CATALYST SYRINGE / CLEAN THE TIP AND RECAP IMMEDIATELY AFTER USE:

Prolonged exposure to air will degrade the catalyst. Immediately after each use, wipe the syringe tip with a paper towel to remove excess material. Then recap. Clogs can be easily cleared with a straight pin or explorer.

ACHIEVING ADEQUATE WORKING TIME:

The instant you add the powder to the base and catalyst, C&B-Metabond begins setting very quickly. To allow adequate working time, the material must be cooled during mixing.

Store the ceramic mixing dish in the refrigerator's freezer compartment and remove it immediately before mixing. This specially-designed dish has a high thermal capacity, so it chills the cement and prolongs working time. The dish features a liquid crystal thermometer affixed to the front. When you remove the dish from the freezer, the thermometer will be off the low end of the scale. The cooler the material when you mix it, the more time you will have to load and seat the prosthesis.

TEMPERATURE	THERMOMETER READS	WORKING TIME	INTRAORAL SETTING TIME*
Room temp	24°C	20 secs	5min
Refrig temp	15°C	2min	5min
Freezer temp	Off scale	5min	5min

** slightly longer for opaque powder.*

To prolong working time, the mixing dish can be placed on a freezer pack. (Or prior to storage in the freezer, the dish can be turned upside down, and the base filled with water to freeze.)

The Neelon technique (also called the "Salt&Pepper" or "Brush-Dip" technique) does not require that the dish be chilled, because the operator adds the powder one brush full at a time immediately before applying it (See page 3). Without the powder, the mixed liquid components will remain potent for about 10 minutes.

POST-CEMENTATION CLEANUP:

C&B-Metabond is a strong adhesive that bonds to practically everything. To facilitate clean-up, use KY jelly, petroleum jelly, mineral oil, glycerine or Blu-Sep separating film to pre-lubricate the exterior of the castings, the adjacent teeth and the gingiva.

To avoid smearing C&B-Metabond all over the crown, wait approximately 2 minutes after seating the restoration before attempting to remove excess cement. At this stage it will peel off without smearing. Once the cement becomes rubbery, be very careful to avoid pulling it from under the restoration. (After the cement has completely cured, cleanup requires hand scalers, diamonds and abrasive discs.)

Remove the cement from instruments and mixing dish before it has set. Cured C&B-Metabond can be softened from instruments by prolonged soaking in chloroform or acetone.

ALLERGIC REACTIONS:

Like virtually all dental resins, C&B-Metabond contains methacrylate. Though allergic reactions to methacrylate are not common, they can occur. In view of the difficulty encountered in removing a restoration cemented with C&B-Metabond, it is prudent to test highly allergic patients or patients with suspected methacrylate sensitivity before using C&B-Metabond. C&B-Metabond contains no HEMA.

HOW TO CEMENT (OR RECEMENT) METAL CROWNS OR INLAYS

Prepare metal surfaces

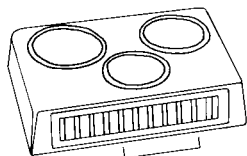
1. Roughen metal surfaces by blasting with 50 micron aluminum oxide at 80+ psi.
2. Thoroughly clean metal to remove residue and oil. Dry completely.

Prepare tooth surfaces.

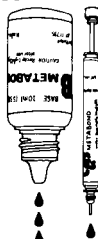
Store the ceramic mixing dish in the freezer. Remove the frozen dish immediately before mixing

USING THE MIXING DISH

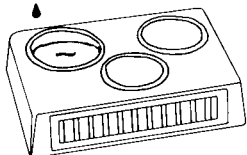
BULK MIX



1.

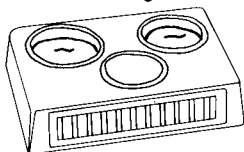
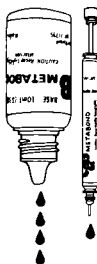


4 drops base
1 drop catalyst
(after expressing catalyst, loosen screw 1 complete turn)

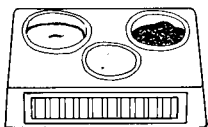


2.

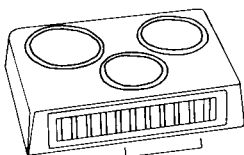
4 drops base
1 drop catalyst
(after expressing catalyst, loosen screw 1 complete turn)



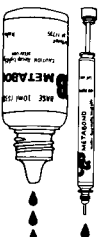
3. 2 scoops powder to one well only



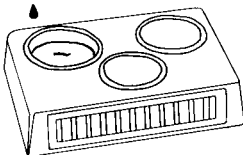
NEELON TECHNIQUE



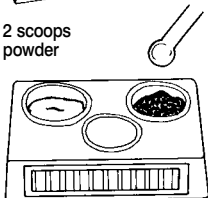
1.



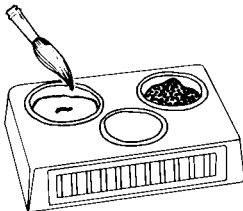
4 drops base
1 drop catalyst
(after expressing catalyst, loosen screw 1 complete turn)



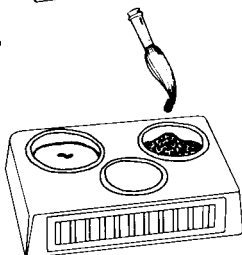
2. 2 scoops powder



3.

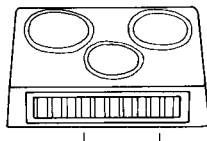


4.



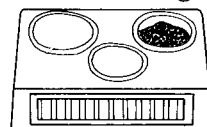
NEELON TECHNIQUE TO BOND TO BOTH METAL AND PORCELAIN

Set up mixing dish only after Etch-Free has been applied to fractured porcelain.



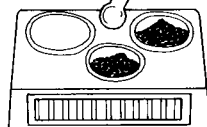
1.

2 scoops tooth-shade powder



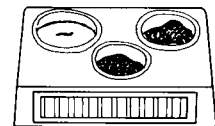
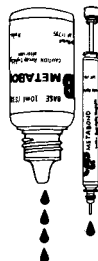
2.

2 scoops clear powder



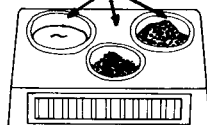
3.

4 drops base
1 drop catalyst
(after expressing catalyst, loosen screw 1 complete turn)



4.

Use Neelon technique to apply tooth-shade powder to metal and clear powder to porcelain.



the cement. (The liquid crystal thermometer on the front of the mixing dish should be off the low end of the scale.)

1. Clean the tooth surface with oil-free, fluoride-free pumice. Wash and dry.
2. Etch enamel surfaces for 30 seconds with a foam pledget saturated with the orange Enamel Etchant. Dab the enamel surface with the pledget. Do not scrub it. Avoid overruns onto the dentin.
3. Thoroughly rinse off the Enamel Etchant and dry tooth completely.
4. Apply the green Dentin-Activator (either gel or liquid) to the dentin for 10 seconds. The liquid is great for postholes. The gel works for most other substrates. (If the activator overruns the enamel, it will not hurt the bond).

Thoroughly rinse off the activator and dry the tooth with a gentle burst of air. Avoid overdrying and dessication.

Cement the casting.

HINT: To facilitate clean-up, apply BluSep, KY jelly, glycerine or mineral oil to the adjacent teeth, outer surface of prosthesis and gingiva.

1. Remove the ceramic mixing dish from the freezer. Holding the bottle vertically, dispense 4 drops of C&B-Metabond Quick base (blue cap) into one well of the chilled ceramic mixing dish. Recap bottle immediately to prevent evaporation.
2. Holding syringe vertically, add one drop catalyst to the base liquid and stir gently for several seconds (no more than 5 seconds). Recap syringe immediately to prevent evaporation.
3. Paint both tooth and casting with the mixed liquid.
4. In the second well of the dish make another identical mixture (4 drops of base and 1 drop of catalyst). For larger castings double the amount (8 drops of base and 2 drops of catalyst). Gently stir the solution for several seconds (no more than 5 seconds).

NOTE: C&B-Metabond comes with 2 powders. The clear powder produces a colorless cement film. The tooth-shade powder produces an opaque white (radiopaque) film.

6. Add powder to the mixed liquid in the second well.
 - If you mixed 4 drops of base and 1 drop of catalyst, add 2 level scoops.
 - If you mixed 8 drops of base and 2 drops of catalyst, add 4 level scoops.
7. Gently stir powder and liquid for 5 seconds to create a creamy cement.
8. If the tooth and casting has dried, re-wet them using more liquid from the first well.
9. Apply the cement to the restoration, and seat it as quickly as possible.
10. Apply a drop of base only (blue cap) to a foam or cotton pledget and use it to wipe away excess cement.

NOTE: The cement becomes rubbery soon after setting begins. Do not pull excess cement away from the margins once it has entered this rubbery stage, because in the process you may pull adhesive out from under the casting.

11. Hold the casting until the material has completely set. (5-6 minutes).
12. Clean any cured cement from the restoration and adjacent teeth using a scaler.

ALTERNATE TECHNIQUE: SMALL CASTINGS CAN BE CEMENTED USING A BRUSH-DIP TECHNIQUE as described in "How to repair a fractured bridge."

* C&B-Metabond adheres to air-blasted precious metal. However, for applications where high bond strengths to precious alloy are required, the casting should be primed with MTL-V primer, (available separately) tin-plated, or heat oxidized.

HOW TO CEMENT ENDODONTIC POSTS

Preparing the post.

Cast posts should be air-blasted with 50-micron aluminum oxide 80+ psi to increase the surface area available for bonding. Thoroughly clean and dry the metal after air-blasting.

Preparing the tooth.

Store the ceramic mixing dish in the freezer. Remove the frozen dish immediately before mixing the cement. (The liquid crystal thermometer on the front of the mixing dish should be off the low end of the scale).

1. After refining the post preparation, try in the post to be certain it fits well but not overly snug. Thoroughly clean and dry post after try-in.
2. Using a paper point, needle syringe or endo-pipette, apply the green Dentin Activator liquid to the walls of the post preparation.
3. After 10 seconds rinse the canal thoroughly.
4. Dry the canal as usual.

Cementing the post.

1. Remove the ceramic mixing dish from the freezer. Holding the bottle vertically, dispense 4 drops of C&B-Metabond base (blue cap) into one well of the chilled ceramic mixing dish. Recap bottle immediately to prevent evaporation.
2. Holding the syringe vertically, add one drop of catalyst to the base and stir gently for several seconds (no more than 5 seconds). Recap the syringe immediately to prevent evaporation.
3. Using a brush or paper point, wet the canal walls with the mixed liquid.
4. Paint the metal post with the mixed liquid.
5. In the second well of the dish make another identical mixture (4 drops base and 1 drop of catalyst.) Gently stir the solution for several seconds (no more than 5 seconds).

NOTE: C&B-Metabond comes with 2 powders. The clear powder produces a colorless cement film. The tooth-shade powder produces an opaque white (radiopaque) film.

6. Add 2 level scoops of powder to the mixed liquid in the second well only.
7. Gently stir the powder and liquid for 5-10 seconds until you create a creamy cement.
8. Coat the post or post/coping assembly with the cement.
9. Working quickly, apply the cement to the canal walls (a Lentullo spiral or needle syringe is helpful).
10. Immediately, insert the post into the preparation. Be certain that the post seats completely.
11. Apply a drop of base only (blue cap) to a foam or cotton pledget and use it to clean away excess cement.

NOTE: The cement becomes rubbery soon after setting begins. Do not pull excess cement away from the post of the margins of the post/coping assembly once it has entered this rubbery stage, because in the process you may pull adhesive out of the post hole or from under the coping.

12. Hold the post until the material has completely set (5-6 min).
13. Clean away any excess cured cement using a scaler.

HINT: If the post will retain a bonded resin core, the C&B-Metabond can also serve as the bonding agent for the core. Follow the directions above, but when applying the Green Activator to the post prep, apply it also to the dentin that will support the core (rinse and dry). Later, after seating the post, brush excess cement over the dentin and post head. After the C&B-Metabond has set completely (5-6 min), build the core.

HOW TO SEAL A SMALL EXPOSURE USING C&B-METABOND

A C&B-Metabond pulp cap is not an alternative to endodontic therapy. A tooth suffering irreversible pulpitis, or one that has limited recuperative power, requires a root canal.

However, if the exposure is small and caries free, with a fresh hemorrhage, C&B-Metabond can serve as an excellent capping material ... particularly if the patient is young so the pulp has strong recuperative powers.

1. Apply the green Dentin Activator (either gel or liquid) for 10 seconds to both the exposure and the dentin immediately surrounding it. (The ferric chloride in the solution should control the bleeding. If the hemorrhage cannot be staunched, chances for a successful pulp cap decrease.)
2. Rinse the tooth thoroughly. Then lightly dry it to eliminate standing water.
3. Take the mixing dish out of the freezer and mix C&B-Metabond using the radiopaque tooth-shade powder (4 drops base, 1 drop catalyst, 2 scoops of powder). Apply it to both the exposure and the dentin immediately surrounding it.
4. Allow the adhesive to polymerize for 5-6 minutes. This will seal the exposure.

Once the exposure has been sealed, the restoration can be bonded or cemented with Amalgambond or C&B-Metabond.

HOW TO REPAIR A PORCELAIN POP-OFF INTRAORALLY **(Bonding composite to precious or non-precious metal)**

Preparing the metal.

Roughen metal surfaces by blasting with 50-micron aluminum oxide at 80+ psi.*

Bonding composite to metal.

Store the ceramic mixing dish in the freezer. Remove the frozen dish immediately before mixing the cement. (The liquid crystal thermometer on the front of the mixing dish should be off the low end of the scale).

1. Holding the bottle vertically, dispense 4 drops of C&B-Metabond base (blue cap) into one well of the chilled ceramic mixing dish. Recap bottle immediately to prevent evaporation.
2. Holding syringe vertically, add 1 drop of catalyst to the base and stir gently for several seconds (no more than 5 seconds). Recap syringe immediately to prevent evaporation.
3. Place two scoops of opaque Tooth-Shade powder in a dry second well of the chilled ceramic mixing dish.
4. Brush the mixed liquid onto the metal surfaces to which composite will be bonded.
5. Using the "Neelon" technique, dip the brush in the liquid and wipe excess from the tip. Dip the wet brush in the powder and form a small ball of powder on the tip of the brush.
6. Brush the powder/liquid mixture on the wet metal surface.
7. Wipe the brush on a gauze pad to remove excess adhesive. Repeat the brush-dip technique until the entire metal surface has been opaqued with a thin, even layer of adhesive. Allow to cure completely. Do not apply composite until you can hear a scaler scrape over the hard surface.
8. Using standard incremental build-up technique, apply your favorite light-cure or self-cure composite to the opaqued metal. (If you are using a thick, high-viscosity composite, flow a thin layer of unfilled or flowable filled composite bonding resin over the opaqued metal and cure before applying the composite).

* If the alloy is high-noble, the durability of the bond can be improved by applying MTL-V primer (purchased separately) after blasting.

HOW TO REPAIR A FRACTURED FACING USING C&B-METABOND AND ETCH-FREE LINER (Bonding composite to both metal and porcelain)

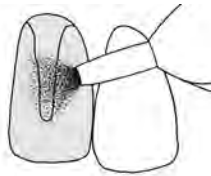


Fig. 1

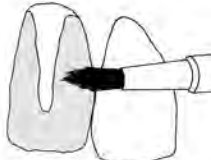


Fig. 2

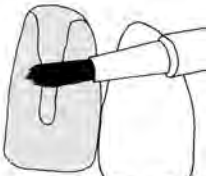


Fig. 3



Fig. 4

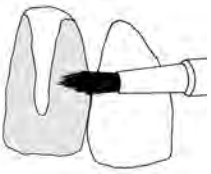


Fig. 5

When C&B-Metabond is used with Parkell's optional Etch-Free liner, it is not necessary to acid-etch the fractured porcelain with hydrofluoric acid or apply a silane coupling.

Preparing the surface for bonding.

1. Roughen and clean all surfaces (both ceramic and metal) to which composite will be bonded by blasting with 50-micron aluminum oxide. (Figure 1)*
2. Mix equal parts of Parkell's Etch-Free porcelain liner (Bottles A & B) in any conventional plastic or ceramic dappen dish. The dish need not be chilled.
3. Paint the mixed Etch-Free solution onto the roughened porcelain. If some solution overruns the exposed metal, it will cause no harm and need not be removed. (Fig. 2)
4. Allow the Etch-Free to dry completely (approximately 2 minutes).

Bonding composite to porcelain and metal.

Store the ceramic mixing dish in the freezer. Remove the frozen dish immediately before mixing the cement. (The liquid crystal thermometer on the front of the mixing dish should be off the low end of the scale.)

1. Place two scoops of C&B-Metabond opaque Tooth-Shade powder in one dry well of the chilled ceramic mixing dish.
2. Place two scoops of the C&B-Metabond Clear powder in a second well of the chilled ceramic mixing dish.
3. Holding the bottle vertically, dispense 4 drops of C&B-Metabond base (blue cap) into the third well of the chilled ceramic mixing dish. Recap bottle immediately to prevent evaporation.
4. Holding the syringe vertically, add 1 drop of catalyst to the base and stir gently for several seconds (no more than 5 seconds). Recap syringe immediately to prevent evaporation.
5. Brush the mixed liquid onto both the metal and ceramic surfaces to which composite will be bonded. (Fig. 3)
6. Coat the metal with opaque Tooth-Shade cement. Using the "Neelon" technique, dip the brush in the liquid and wipe excess from the tip. Dip the brush in the Opaque Tooth-Shade powder and form a small ball of powder on the tip of the brush.
7. Brush the ball of opaque powder/liquid mixture onto the metal surface.
8. Wipe the brush on a gauze pad to remove excess adhesive. Repeat the brush-dip procedure until the entire metal surface has been opaqued with a thin, even layer of C&B-Metabond. (Fig. 4)
9. Coat the fractured porcelain with clear cement. Using a fresh brush, dip the brush in the liquid and wipe excess from the tip. Dip the brush in the Clear powder and form a small ball of powder on the tip of the brush. It's ok if some clear gets on the opaque.
10. Brush the ball of clear powder/liquid mixture onto the porcelain surface.

11. Wipe the brush on a gauze pad to remove excess adhesive. Repeat until the entire porcelain surface has been covered with a thin, even layer. (Fig. 5)

12. Allow to cure completely until you can hear a scaler scrape on the surface.

* If the alloy is high-noble, the durability of the bond can be improved by applying MTL-V primer (purchased separately) after blasting. Do not allow the primer to touch the porcelain surface being bonded

13. Using standard incremental build-up technique, apply your favorite light-cure or self-cure composite to the opaqued metal. (If you are using a thick, high-viscosity composite, flow a thin layer of unfilled or flowable filled composite bonding resin over the opaqued metal and cure before applying the composite).

PORCELAIN LAMINATES AND CERAMIC CROWNS

Laminates: When used with Etch-Free porcelain liner, C&B-Metabond will adhere to etched or unetched porcelain. However, the cement does not allow the operator to adjust the shade as do resin luting agents formulated for cementing laminates. Furthermore, autocuring C&B-Metabond does not permit the operator to try-in the laminate in order to check the shade.

Therefore we do not recommend C&B-Metabond for laminates. Instead, we suggest that Amalgambond (4-META-based bonding agent) be used on the tooth. The acid-etched, silanated laminate can then be cemented with a conventional laminate cement.

Ceramic Crowns: C&B-Metabond can be used to cement all-ceramic crowns.* Before cementation, the inner aspect of the crown must either be acid-etched and silanated or instead painted with Etch-Free bonding liner. However, because C&B-Metabond offers only 2 colors (Clear and Radiopaque Tooth-Shade), **it is not recommended for translucent crowns where a significant portion of the final shade will be contributed by the cement.**

HOW TO CREATE A DIRECT PERIODONTAL SPLINT

Because C&B-Metabond is not brittle like composite and is color stable, it is excellent for fast durable splinting of mobile anteriors. In the mandible, C&B-Metabond is generally used alone. In the maxilla the splint generally includes wire or fiber reinforcement.

1. A rubber dam or lubricated interproximal wedges will prevent the unset adhesive from flowing too far gingivally.
2. Set up the mixing dish for the Neelon Technique (page 3) using Clear Powder (violet) in one well and 4 drops base (blue) and 1 drop catalyst in another well.
3. Etch the proximal and lingual surfaces with enamel etchant (white) for 30 seconds rinse & dry.
4. Wet the surfaces to be bonded with the base/catalyst mixture.
5. Using the brush-dip (Neelon) technique, apply C&B-Metabond to the proximal and lingual areas to lock the teeth together.

MATERIAL SAFTEY DATA SHEET	PARKELL, INC. 300 EXECUTIVE DRIVE EDGEWOOD, NY 11717 631-249-1134	24-HOUR EMERGENCY TELEPHONE 1-800-535-5053
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SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME:	C&B METABOND ENAMEL ETCHANT	STOCK NO:	S395
DOT HAZARD LABEL:	Corrosive	UN NUMBER:	UN1805
PROPER SHIPPING NAME:	Phosphoric Acid Solution	DATE PREPARED:	05/01/09
NFPA CODES:	HEALTH - 2 FLAMMABILITY - 2	REACTIVITY -	0

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS	CAS NUMBER	PEL	TLV	%
Phosphoric acid	7664-38-2	1 mg/m3	1 mg/m3	
Polyvinyl alcohol	9002-89-5	NE	NE	
Water	7732-18-5	NE	NE	

SECTION III - PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT:	135° C	SPECIFIC GRAVITY (H ₂ O = 1):	NE
VAPOR PRESSURE:	NE	PERCENT VOLATILES:	NE
VAPOR DENSITY (Air = 1):	NE	EVAPORATION RATE (Butyl Acetate = 1):	NE
APPEARANCE AND ODOR:	Orange-red, syrup-like liquid.		

* No adhesive (including C&B-Metabond) forms significant bonds to aluminum or zirconia based crowns.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TCC): Non-flammable FLAMMABLE LIMIT (air, % by vol.) UPPER: NE LOWER: NE

EXTINGUISHER MEDIA: Alcohol foam, carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: During emergency conditions, overexposure to thermal decomposition products may cause health hazard. Self-contained breathing apparatus should be worn.

UNUSUAL FIRE & EXPLOSION HAZARDS: Phosphoric acid does not burn; however, it can react with metal to liberate hydrogen gas that can readily form flammable or explosive mixture with air. When exposed to flame, emits toxic fumes and gases.

SECTION V - REACTIVITY DATA (PHYSICAL HAZARDS)

STABILITY: STABLE UNSTABLE

CONDITIONS TO AVOID: Storage in metal containers, in direct sunlight, or near sources of heat.

INCOMPATIBILITY (Materials to avoid): Reacts vigorously with carbonates, alkalis and powdered metals to form phosphate salts and is corrosive (especially at temp. 85° C) to common metals. It liberates hydrogen gas when reacting with metals.

HAZARDOUS DECOMPOSITION PRODUCTS: NE

HAZARDOUS POLYMERIZATION: MAY OCCUR WILL NOT OCCUR

CONDITIONS TO AVOID:

SECTION VI - HEALTH HAZARD DATA

PRIMARY ROUTE(S) OF ENTRY: EYES SKIN INHALATION INGESTION

HEALTH HAZARDS (Acute & Chronic): Inhalation is not a hazard unless misted or heated at high temperature. Mist inhalation may cause coughing, sneezing, salivation and difficult breathing. Severe exposures may lead to chemical pneumonitis. As a strong mineral acid, it is corrosive and can cause irritation or severe burns on contact with any body tissue, although it may not cause immediate burning upon skin contact. Ingestion can result in severe G.I. damage. There are no reported cases of systemic effects. It does not cause phosphorus poisoning.

SIGNS & SYMPTOMS OF EXPOSURE: See above.

CARCINOGENECITY: No NTP? No IARC MONOGRAPHS? No OSHA?

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air. If cough or other respiratory symptoms develop, consult medical personnel. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention immediately.

EYES: Immediately flush with copious amounts of water, including under eyelids, for at least 15 minutes. If irritation persists, get medical attention.

SKIN: Wash material off the skin with copious amounts of water. Get medical attention. Wash contaminated clothing and decontaminate footwear before reuse.

INGESTION: Promptly give several glasses of water or milk to drink to dilute. Then give milk of magnesia or aluminum hydroxide gel. Do not induce vomiting; if it occurs, give more fluid, especially milk. Get medical attention.

SECTION VII - SPECIAL PRECAUTIONS AND SPILL OR LEAK PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE: Store in closed containers. Store away from direct sunlight, source of heat, alkalis, sulfides, cyanides, and metal powder.

OTHER PRECAUTIONS: Avoid breathing mist. Prevent contact with eyes, skin or clothing. Do not ingest.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: For small spills and residues cover with soda ash or soda ash - slaked lime mixture (1:1). Pick-up and place in polyolefin bottle for disposal. Flush spill area with water.

WASTE DISPOSAL METHODS (Consult federal, state, and local regulations): Dispose of in accordance with Federal, State, and Local regulations.

SECTION VII - SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

RESPIRATORY PROTECTION:	Respiratory protection not required for normal work procedures, but if misting occurs, use a high efficiency particulate respiratory or self-contained breathing apparatus, with full face piece needed above TLV.
VENTILATION:	Provide general ventilation and local exhaust ventilation where misting can occur.
PROTECTIVE GLOVES:	Use rubber gloves and apron.
EYE PROTECTION:	Wear chemical safety goggles and/or face shield for mist or where splashing is possible. Do not wear contact lenses.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT:	Provide eyewash station. Have neutralizing materials readily available for emergency use. Wash contaminated clothing before reuse.
WORK/HYGIENIC PRACTICES:	Wash hands before eating, drinking or smoking.

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SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME:	C&B METABOND DENTIN ACTIVATOR	STOCK NO:	S394/S393
DOT HAZARD LABEL:	Corrosive	UN NUMBER:	UN2582
PROPER SHIPPING NAME:	Ferric chloride solution	DATE PREPARED:	05/01/09
NFPA CODES:	HEALTH - 0 FLAMMABILITY - 2 REACTIVITY - 0		

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS	CAS NUMBER	PEL	TLV	%
Citric acid	77-92-9	NE	NE	
Ferric chloride solution	7705-08-0	NE	NE	7%
Polyvinyl alcohol	9002-89-5	NE	NE	
Water	7732-18-5	NE	NE	73%

SECTION III - PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT:	100° C	SPECIFIC GRAVITY (H ₂ O = 1):	NE
VAPOR PRESSURE:	NE	PERCENT VOLATILES:	NE
VAPOR DENSITY (Air = 1):	NE	EVAPORATION RATE (Butyl Acetate = 1):	NE
APPEARANCE AND ODOR:	Green-yellow, thick liquid.		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TCC):	Above 38° C	FLAMMABLE LIMIT (air, % by vol.)	UPPER:	NE	LOWER:	NE
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EXTINGUISHER MEDIA: Alcohol foam, carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: During emergency conditions, overexposure to thermal decomposition products may cause health hazard. Self-contained breathing apparatus should be worn.

UNUSUAL FIRE & EXPLOSION HAZARDS: When exposed to flame, emits toxic fumes and gases.

SECTION V - REACTIVITY DATA (PHYSICAL HAZARDS)

STABILITY:	<input checked="" type="checkbox"/> STABLE	<input type="checkbox"/> UNSTABLE
CONDITIONS TO AVOID:	None	
INCOMPATIBILITY (Materials to avoid):	Bases and strong alkalis.	
HAZARDOUS DECOMPOSITION PRODUCTS:	NE	
HAZARDOUS POLYMERIZATION:	<input type="checkbox"/> MAY OCCUR	<input checked="" type="checkbox"/> WILL NOT OCCUR
CONDITIONS TO AVOID:		

SECTION VI - HEALTH HAZARD DATA

PRIMARY ROUTE(S) OF ENTRY: EYES SKIN INHALATION INGESTION

HEALTH HAZARDS (Acute & Chronic): Inhalation is not a hazard unless misted or heated at high temperature. Mist inhalation may cause coughing and sneezing. Excessive exposure may result in irritation of the eyes, skin and mucous membrane of the respiratory tract.

SIGNS & SYMPTOMS OF EXPOSURE: Irritation of eyes, skin and mucous membrane.

CARCINOGENECITY: No NTP? No IARC MONOGRAPHS? No OSHA?

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air. If cough or other respiratory symptoms develop, consult medical personnel. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention immediately.

EYES: Immediately flush with copious amounts of water, including under eyelids, for at least 15 minutes. If irritation persists, get medical attention.

SKIN: Wash material off the skin with copious amounts of water. If irritation persists, get medical attention.

INGESTION: If substantial quantities are ingested, rinse mouth and give person 2 or 3 glasses of milk or water to drink. Get medical attention.

SECTION VII - SPECIAL PRECAUTIONS AND SPILL OR LEAK PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE: Store in closed containers. Store away from direct sunlight.

OTHER PRECAUTIONS: None

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: For small spills and residues absorb with paper towels. Pick-up and place in polyolefine bottle for disposal. Flush spill area with water.

WASTE DISPOSAL METHODS (Consult federal, state, and local regulations): Dispose of in accordance with Federal, State, and Local regulations.

SECTION VII - SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

RESPIRATORY PROTECTION: Respiratory protection not required for normal work procedures.

VENTILATION: None usually necessary.

PROTECTIVE GLOVES: None required.

EYE PROTECTION: Wear chemical safety goggles or glasses. Do not wear contact lenses.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Provide eyewash station.

WORK/HYGIENIC PRACTICES: Wash hands before eating, drinking or smoking.

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SECTION 1 – CHEMICAL PRODUCT

PRODUCT NAME: 4-META UNIVERSAL CATALYST-V MSDS NO: S371

SECTION 2 – COMPOSITION INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS	CAS NUMBER	PEL	TLV	%
tri-n-butylborane (TBB) / partially oxidized (TBB-O)	122-56-5 / 688-74-4			
Hydrocarbon				

SECTION 3 – HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Highly flammable liquid (F). Reactive with water and air to generate heat and flammable gas.

POTENTIAL HEALTH EFFECTS

EYES: May cause irritation, chemical burns and possible corneal injury.

SKIN: May cause skin irritation.

INHALATION: Causes respiratory tract irritation. May cause dizziness, dullness, headache. Higher concentration can produce central nervous system depression, narcosis.

INGESTION: Harmful if swallowed.

CHRONIC EFFECTS: Not known.

SIGNS & SYMPTOMS:

CARCINOGENECITY: NA NTP? No IARC MONOGRAPHS? No ACGIH?

SECTION 4 – FIRST-AID MEASURES

INHALATION: Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

EYES: Immediately flush with flowing water for at least 15 minutes. Get medical attention.

SKIN: Flush with soap and plenty of water. Get medical attention if irritation develops or persists.

INGESTION: Promptly drink several glasses of water or milk to dilute. Get medical attention.

NOTE TO PHYSICIANS:

SECTION 5 – FIRE-FIGHTING MEASURES

FLASH POINT (TCC): Unknown **FLAMMABLE LIMIT (air, % by vol.)** acetone **UPPER:** 13 % **LOWER:** 2 %

FLAMMABILITY CLASSIFICATION (CFR 1910.1200): Flammable Liquid UN No. 1993

EXTINGUISHING MEDIA: Foam, dry chemical, carbon dioxide or dry sand, water spray.

FIRE FIGHTING INSTRUCTIONS: During emergency conditions, over-exposure to decom- position products may cause health hazard. Self- contained breathing apparatus should be worn.

UNUSUAL FIRE & EXPLOSION HAZARDS: Highly flammable liquid, reactive with water and air to generate heat and flammable gases.

HAZARDOUS COMBUSTION PRODUCTS: Flammable gas and toxic gas may be released by reaction with water or air.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal Precaution:
For skin protection wear impervious protective gloves and clothing. For eye protection use safety goggle or a full-face shield. If the exposure limit is exceeded use an organic vapor respirator.

Environmental Precautions: May be hazardous to the environment. **Methods For Cleaning-Up:** In case material is released or spilled, remove all ignition sources, and ventilate the area of leak or spill. Collect spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Contents may develop pressure by decomposition.

SECTION 7 – HANDLING AND STORAGE

HANDLING: Observe normal warehouse handling procedures. Protect against physical damages.

STORAGE: Store in a dry and dark well-ventilated place at cool (5~30°C) and stable temperature. Store away from ignition sources, flammable solids with large surface area (such as cotton, gauze).

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Use local exhaust to keep exposures to a minimum.

EYE/FACE PROTECTION: Use safety glasses. Eye wash station near work area.

SKIN PROTECTION: Use impervious protective gloves to prevent skin contact.

RESPIRATORY PROTECTION: None required during normal use of this product.

EXPOSURE GUIDELINES: Not established.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Colorless transparent liquid. Like n-butanol.

BOILING POINT: 56°C (acetone) **SPECIFIC GRAVITY (H₂O = 1):** approx. 0.8

VAPOR PRESSURE: Not known **PERCENT VOLATILES:**

VAPOR DENSITY (Air = 1): Not known **EVAPORATION RATE (Butyl Acetate = 1):**

SOLUBILITY IN WATER: Decomposes, partly soluble **PH:** Not applicable

SECTION 10 – STABILITY AND REACTIVITY

STABILITY: Reactive with air or water. **HAZARDOUS POLYMERIZATION:** Will not occur.

CONDITIONS TO AVOID: Heat beyond 300°C. Refrigeration. Fluctuating temperature. Direct sunlight. Ignition sources.

INCOMPATIBILITY (Materials to avoid): Strong oxidizers or halogenated hydrocarbons. Flammable solids with large surface area (such as gauze, cotton).

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, butanol, boron oxide, borane.

SECTION 11 – TOXICOLOGICAL INFORMATION

Health Hazards: (immediate, delayed, acute, chronic) (TBB-O): Not known. Easily decomposed to n-butanol and boric acid. (acetone): Inhalation of high concentration may cause central nervous system effects characterized by headache, dizziness and unconsciousness.

Toxicity: LD50: Oral 1,125 mg/Kg (Rat/borane), 2,150 mg/Kg(Mouse/borate)
4,360 mg/Kg (Rat/n-butanol), 2,660 mg/Kg (Rat/boric acid)
Mutagenicity: Negative (Schmalz G. et al., J. Dent. Res., vol 80, 1234, 2001)

SECTION 12 – ECOLOGICAL INFORMATION

General: This substance may be hazardous to the environment.
Mobility: When released, this substance is expected to decompose quickly by contact with air or water.
Degradability, Accumulation, Ecotoxicity, Other adverse effects: Not known.

SECTION 13 – DISPOSABLE CONSIDERATIONS

Danger in disposal: Highly reactive with water and air. This substance should be handled as hazardous waste.
Disposal method: Consult federal, state, and local regulations): Do not empty into sewer. This substance should be sent to an approved incinerator.

SECTION 14 – TRANSPORT INFORMATION (not meant to be all-inclusive)

PROPER SHIPPING NAME: Flammable liquid, n.o.s.
DOT HAZARD LABEL: UN1993 - Flammable liquid, n.o.s. UN/NA NUMBER: UN 1993
PRECAUTIONS FOR TRANSPORT: Highly flammable liquid
IMDG Class 3.2, PG II
ICAO/IATA Class 3, PG II

SECTION 15 – REGULATORY INFORMATION (not meant to be all-inclusive)

SECTION 16 – OTHER INFORMATION

NFPA CODES: HEALTH - FLAMMABILITY - REACTIVITY -
WORK/HYGIENIC PRACTICES: Wash hands before eating, drinking or smoking.
DATE PREPARED: 05/01/09 PREPARED BY: R. Burke

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SECTION I - PRODUCT IDENTIFICATION

PRODUCT NAME: C&B METABOND BASE **STOCK NO:** S398
DOT HAZARD LABEL: Flammable Liquid **UN NUMBER:** UN1247
PROPER SHIPPING NAME: Methyl Methacrylate Monomer, Inhibited **DATE PREPARED:** 05/01/09
NFPA CODES: HEALTH - 2 FLAMMABILITY - 3 REACTIVITY - 2

II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

<u>HAZARDOUS COMPONENTS</u>	<u>CAS NUMBER</u>	<u>PEL</u>	<u>TLV</u>	<u>%</u>
Methyl Methacrylate	80-62-6	100 ppm	100 ppm	

SECTION III - PHYSICAL & CHEMICAL CHARACTERISTICS

BOILING POINT: 101°C **SPECIFIC GRAVITY (H2O = 1):** 0.944
VAPOR PRESSURE: 40 mm HG **PERCENT VOLATILES:** NA
VAPOR DENSITY (Air = 1): 3.45 **EVAPORATION RATE (Butyl Acetate = 1):** NA
APPEARANCE AND ODOR: Colorless transparent liquid.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TCC): 10 °C **FLAMMABLE LIMIT (air, % by vol.)** **UPPER:** 1.7 % **LOWER:** 8.2 %
EXTINGUISHER MEDIA: Foam, dry chemical, carbon dioxide.
SPECIAL FIRE FIGHTING PROCEDURES: During emergency conditions, overexposure to thermal decomposition products may cause health hazard. Self contained breathing apparatus should be worn.
UNUSUAL FIRE & EXPLOSION HAZARDS: When exposed to flame, emits toxic fumes and gases.

SECTION V - REACTIVITY DATA (PHYSICAL HAZARDS)

STABILITY: STABLE UNSTABLE
CONDITIONS TO AVOID: Heat and light.
INCOMPATIBILITY (Materials to avoid): Polymerization catalysts (peroxides, persulfates, light, heat, nitric acid and other strong oxidizers, ammonia and amines, halogens and halo-compounds).
HAZARDOUS DECOMPOSITION PRODUCTS: Thermal-oxidative degradation can produce toxic and corrosive materials, including carbon monoxide.
HAZARDOUS POLYMERIZATION: MAY OCCUR WILL NOT OCCUR
CONDITIONS TO AVOID: Hazardous polymerization may occur, especially when heated or catalyzed.

SECTION VI - HEALTH HAZARD DATA

PRIMARY ROUTE(S) OF ENTRY: EYES SKIN INHALATION INGESTION
HEALTH HAZARDS (Acute & Chronic): Ingestion may cause headache, dizziness, nausea, tinnitus, dyspnea, etc. May cause corrosion after contact is made with human eye. Primary irritant on human skin, repeated prolonged contact can cause irreversible damage to human skin. Inhalation can cause irritation of the upper respiratory tract and mucous membranes, and, at high concentrations can cause symptoms similar to those which may be experienced upon ingestion.
SIGNS & SYMPTOMS OF EXPOSURE: see above.
CARCINOGENECITY: No NTP? No IARC MONOGRAPHS? No OSHA?

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air. If cough or other respiratory symptoms develop, consult medical personnel. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Consult medical personnel.
EYES: Immediately flush with copious amounts of water for at least 15 minutes. Get medical attention.
SKIN: Wash skin with copious amounts of soap and water. If irritation exists, get medical attention. Wash contaminated clothing and decontaminate footwear before reuse.
INGESTION: Induce vomiting. Get medical attention immediately.

SECTION VII - SPECIAL PRECAUTIONS AND SPILL OR LEAK PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE: Do not store under pure nitrogen or sparge with nitrogen or oxygen-free gas.
OTHER PRECAUTIONS: NE
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: People not wearing protective equipment and clothing should be restricted from areas of spill or leaks until cleanup has been completed. If this material is spilled or leaked, remove all ignition sources and ventilate area of spill or leak. Absorb small quantities on paper towels. Evaporate in safe place such as a fume hood. Allow sufficient time for evaporating vapors to completely clear the hood ductwork. Burn the paper in a suitable location away from combustible materials. Large quantities can be collected and burned in a suitable combustion chamber.
WASTE DISPOSAL METHODS (Consult federal, state, and local regulations): Incinerate liquid and diking material after addition of excess inhibitor, in accordance with Federal, State, and Local regulations.

SECTION VII - SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

RESPIRATORY PROTECTION: NIOSH-approved respiratory protection for organic gases if needed.
VENTILATION: Use local exhaust to keep exposures to a minimum.
PROTECTIVE GLOVES: Rubber or PVC Gloves
EYE PROTECTION: Safety glasses or full face shield.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Safety shower and eyewash station.
WORK/HYGIENIC PRACTICES: Wash hands and face before eating, drinking and/or smoking.

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SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **C&B METABOND POWDERS** **MSDS NO:** **S396 VAR.**

SECTION 2 – COMPOSITION INFORMATION ON INGREDIENTS

<u>HAZARDOUS COMPONENTS</u>	<u>CAS NUMBER</u>	<u>PEL</u>	<u>TLV</u>	<u>%</u>
Polymethylmethacrylate (PMMA)	9011-74-7			
Metal Oxide	1314-23-4			

SECTION 3 – HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

POTENTIAL HEALTH EFFECTS

EYES: Can cause irritation due to physical contact.

SKIN: Practically negligible.

INHALATION: Mist inhalation can cause coughing.

INGESTION: Practically negligible.

CHRONIC EFFECTS:

SIGNS & SYMPTOMS:

CARCINOGENECITY: No NTP? No IARC MONOGRAPHS? No OSHA?

SECTION 4 – FIRST-AID MEASURES

INHALATION: Although no adverse effects anticipated by breathing during proper handling, if breathing difficult give oxygen and get medical attention.

EYES: Immediately flush with flowing water for 15 minutes. If redness, itching or a burning sensation develops, get medical attention.

SKIN: Wash material off with water.

INGESTION: Normally no treatment required.

NOTE TO PHYSICIANS:

SECTION 5 – FIRE-FIGHTING MEASURES

FLASH POINT (TCC): None FLAMMABLE LIMIT (air, % by vol.) UPPER: NA LOWER: NA

FLAMMABILITY CLASSIFICATION (CFR 1910.1200):

EXTINGUISHING MEDIA: Water fog, foam, dry chemical or carbon dioxide.

FIRE FIGHTING INSTRUCTIONS: During emergency conditions, to prevent overexposure to thermal decomposition products, self-contained breathing apparatus should be worn.

UNUSUAL FIRE & EXPLOSION HAZARDS:

HAZARDOUS COMBUSTION PRODUCTS: Toxic gases such as carbon monoxide may be released in a fire.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

In case material is released or spilled, sweep into container for disposal.

SECTION 7 – HANDLING AND STORAGE

HANDLING: Observe normal warehouse handling procedures.

STORAGE: Store in a cool, dry and dark place. Store away from other materials which may cause cross-contamination.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Eye wash station near work area.

EYE/FACE PROTECTION: Use safety glasses

SKIN PROTECTION: Use rubber or PVC gloves to prevent skin contact.

RESPIRATORY PROTECTION: None normally needed.

EXPOSURE GUIDELINES:

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR:	Tan powder.		
BOILING POINT:	NA	SPECIFIC GRAVITY (H2O = 1):	1.96
VAPOR PRESSURE:	NA	PERCENT VOLATILES:	NA
VAPOR DENSITY (Air = 1):	NA	EVAPORATION RATE (Butyl Acetate = 1):	NA
SOLUBILITY IN WATER:	Nil	PH:	

SECTION 10 – STABILITY AND REACTIVITY

STABILITY: Stable under normal conditions. HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID:
INCOMPATIBILITY (Materials to avoid): None
HAZARDOUS DECOMPOSITION PRODUCTS:

SECTION 11 – TOXICOLOGICAL INFORMATION

SECTION 12 – ECOLOGICAL INFORMATION

SECTION 13 – DISPOSABLE CONSIDERATIONS

Waste must be disposed of in accordance with federal, state, and local environmental control regulations.

SECTION 14 – TRANSPORT INFORMATION (not meant to be all-inclusive)

PROPER SHIPPING NAME: Non-hazardous
DOT HAZARD LABEL: UN/NA NUMBER:

SECTION 15 – REGULATORY INFORMATION (not meant to be all-inclusive)

SECTION 16 – OTHER INFORMATION

NFPA CODES: HEALTH - FLAMMABILITY - REACTIVITY -

WORK/HYGIENIC PRACTICES: Wash hands before eating, drinking or smoking.

DATE PREPARED: 05/01/09 PREPARED BY: R. Burke

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