normac

600R AND 900
COLD BOND CEMENT SERIES
APPLICATION GUIDE

The key to achieving a successful bonding process when applying cold bond cements and metal primers is in fully understanding the correct application procedures and limitations, both in the field and in the workshop.

NORMAC Cements are chloroprene or polymer based and are two component, room temperature curing liquid adhesives used to bond materials together without the use of heat, pressure, or special equipment. These cements require hardener mixed at a specific ratio to achieve maximum bond strength. See product TDS and SDS for further detailed information.

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MATERIAL CONDITIONING:

- During colder temperatures, cements will tend to thicken or gel. To return the product to a workable state, simply warm to 23°C (73°F). Further solvent dilution is not required and could cause negative results.

APPLICATION CONDITIONS:

- Ambient and surface temperature should be similar and between 7°C to 45°C (45°F to 113°F). Warming surfaces and surrounding air is a good option when working in colder temperatures. Relative humidity should be below 80% and dew point is maintained 3°C (5°F) above substrate temperature for the duration of the application. Always protect the surface from contaminants and direct sunlight.

DRYING TIMES:

- Some applicators claim to have difficulty in achieving satisfactory adhesion results when using cold bond cement systems. This is normally due to incorrectly determining drying times of the cement (both cement and metal primer) in varying conditions. The drying times of the cement and metal primer will vary considerably depending on the air temperature and relative humidity.
- Drying times and cure rates of the cement are more adversely affected in LOW temperature HIGH humidity conditions. The use of a fan to increase the air circulation will assist in speeding up the evaporation or flashing off the solvent.
- It is imperative that the metal primer and 1st coat of cement be completely dry prior to continuing the application. We recommend a minimum drying time of 1 hour for each. This drying time may be adjusted at the discretion of the applicator monitoring the conditions at the workplace.

GENERAL SURFACE PREPARATION:

- All substrate surfaces are completely dry and free from contamination. The substrate and desired bond strength will determine the surface preparation process. For metal, grit-blasting using standard SSPC-SP10 including minimum 50 micron (0.002") anchor depth profile for maximum adhesion and or for other substrates, mechanically roughen using standard SSPC-SP11 to achieve desired adhesion strength. Use dry clean compressed air, broom, or a vacuum to remove any dust or debris from this process. See "Substrate Preparation" at the end of this guide for more detail.

***Available are individual step by step application instructions for each substrate including rubber, metal, fabric, concrete, fiberglass, wood, PVC, and polyurethane.**

MIXING AND APPLICATION INSTRUCTIONS:

- Mix by stirring ONLY (not shaking) the appropriate amount of 900 or 600R Cement and Hardener for one minute, then begin your 1st coat (dry coat) with a cement brush using a scrubbing motion to ensure all areas are filled and covered evenly while avoiding runs and puddles. Allow this 1st coat to dry completely for a minimum of one hour (overnight is ideal) before moving to the 2nd coat (tack coat).
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- Apply the second coat (tack–coat) of 900 or 600R Cement to both surfaces at the same time to ensure drying times are equal. Apply evenly, similar to painting using a brush or roller WITHOUT using a scrubbing motion. At the optimum joining time, the cement feels tacky to the touch but does not transfer to the back of the hand when testing. Normally this takes approximately 7 to 10 minutes for 900 "E" series, 10 to 15 minutes for 900 "R" series, and 3 to 5 minutes for 600R. If the tack coat becomes too dry, re-cement both surfaces and wait for the tack stage.
- Once the materials are placed together and positioned, and depending on material thickness, stitch vigorously using a small flat roller, rubber mallet, and or pneumatic hammer tool to apply pressure and ensure maximum surface contact. Make overlapping passes, working out towards the edges while removing any trapped air.

CURE RATE AT 23°C (73°F), 50% RH:

- Typical for all cross-linked cold bond cements on the market, expect 50% adhesive strength under 4 hours, 80% after 24 hours and the balance over the next 14 days.
- As a guide only, for every 5.5°C (10°F) drop in temperature you can double the cure time and vice versa for warmer temperatures.
- From experience when belt splicing, the more surface area within the splice, the more strength there will be for speedy back to service applications. Minimum 3 to 4 hours to return to service if the belt splice length is equal to the width of the belt.
- If heat curing is used, ensure the temperature stays 10°C (20°F) below the cements solvent boiling point at all times.

STORAGE:

- Keep in a dry location away from direct sunlight.
- Temperature 23°C (73°F).
- Pay attention to the shelf life and rotate stock.
- Only open containers as they are required

SAFETY AND WORKPLACE ENVIRONMENT CONTROLS:

- Strict adherence to each SDS and regional safety regulations must be practiced.
- Adequate ventilation must always be maintained to prevent the accumulation of solvent fumes during the application process. It is important to remember that solvent vapor is heavier than air and will therefore flow downward from the point of application. Many workshop facilities provide air exhaust fans which are installed at ceiling level. Ideally, when working with cements and primers, extractor or exhaust fans should be placed at floor level or below the working place to be effective.
- To ensure a professional and high-quality installation, it is imperative to provide suitable protection from the elements, not only for protection of the product but also for the technician. Conditions vary greatly from each season and country. The use of protective covers such as awnings and tarpaulins are basic to this issue. There are many forms of portable framework available today that will provide adequate protection against adverse conditions.
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- One option that is commonly used for conveyor work is a protected area or splicing station. These are normally permanent or semi-permanent structures. This is ideal and such facilities are mainly found at the larger operating mines and industrial complexes where the process equipment is critical to the continuous operation of the plant.
- In addition to the above, there are a few options available to the applicator in controlling conditions in colder weather, some of which are quartz halogen lighting, propane heater, infra-red heater, infra-red drying hoods. *Note:* The use of diesel fired heaters is NOT RECOMMENDED, as the emissions may contaminate the prepared surfaces and cements.

METAL PRIMERS:

NP-5001 primer serves three major functions when applied to a metal substrate.

- Prevents surface oxidation of the substrate when applied immediately after the metal cleaning process.
- Improves the bonding strength of the cement to metal by as much as 50% including proper surface preparation.
- Allows metal to be stored up to 7 days when protected from sunlight and contamination.

Mechanically mix, thoroughly stir the primer prior to the application. As with the cements, a settling or separation of the solids from the solvent base can occur. If this is not done, you will not achieve a successful bond. Typically, this will manifest itself where the cement does not stick to the primer or where the primer/cement coatings come off the metal leaving bright steel.

TYPICAL BONDING MISTAKES:

- **Bonding when the Cement is too DRY.** This is the most common cause of bond failure. The adhesion will be poor and spotty. If this occurs, re-coat the surfaces to be bonded as recommended in the application procedures and wait for tack stage before joining.
- **Bonding when the Cement is too WET.** Test the coated surface with the back of the finger. It should feel tacky, but not leave a residue on your finger. If the surfaces are placed together when the surfaces are too wet, the initial bonding strength will be poor. However, the adhesive/hardener mixture will cure over time, as the solvent in the adhesive evaporates.
- **Bonding without adequate pressure.** Sufficient pressure should be applied to ensure maximum surface contact. The ultimate strength of the bond is improved as surface contact pressure is increased. There are a number of ways to apply surface pressure. Typically hand-held stitchers/rollers are used for rubber thicknesses under 10mm/3/8". Rubber mallets and/or pneumatic mallets are used for rubber thicknesses greater than 10mm/3/8".
- The addition of continuous weight or pressure is advantageous where insufficient pressure can be applied by hand. In such cases, items may be left to stand under pressure overnight.
- When rubber lining large items such as tanks and hoppers etc, applying the lining while the cement is still moist allows the lining to be re-positioned if needed. Once the lining is in place, pressure must be applied.
- Dry fitting is the term given to the pre-positioning of the rubber lagging or lining prior to applying the adhesive. This is a very effective method of installation and can considerably simplify the lining process.

SUBSTRATE PREPARATION

RUBBER – If the rubber has a bonding layer you have the option to move directly to the cement application. If not, prepare the bonding side of the rubber by first wiping entirely to remove contaminants with NR-TR or a non-oil-based solvent, then roughen to remove all shiny spots using a slow speed grinder with 24 to 36 aluminum oxide sanding disk or stiff wire wheel (< 2000rpm). Avoid tools with high speed rotation as this will result in burning and charring the rubber, negatively affecting adhesion.

METAL - Remove all weld splatter, weld seams, sharp edges, and irregularities by surface grinding. Grit blast using SSPC-SP10 specifications near white including a minimum anchor depth profile of 50 microns (.002"). Be aware using other forms of surface preparations will reduce adhesion strength. Immediately after metal surface preparation, apply one even coat of NP-5001 metal primer. Primed metal can be stored for up to 7 days if kept cool, dry, and away from UV exposure. Cover using to maintain cleanliness.

FABRIC BELTING– Prepare the fabric rubber belting by first wiping entirely to remove contaminants with NR-TR or a non-oil-based solvent. Be careful not to saturate the fabric with solvent as this may result in poor bond strength. While avoiding damage to the fabric, roughen rubber around the fabric to remove all shiny spots and create a profile using a slow speed grinder with 24 to 36 aluminum oxide sanding disk or stiff wire wheel (< 2000rpm). Avoid tools with high speed rotation as this will result in burning and charring the rubber, negatively affecting adhesion. Fabric that is R.F.L. treated should be cleaned and dry prior to cement application. Avoid removing R.F.L. treatment as this will reduce fabric strength. Do not sand or grind fabric.

FIBERGLASS – Prepare the fiberglass surface by first wiping entirely to remove contaminants with NR-TR or a non-oil-based solvent. Then sand the surface to create a profile and remove all shiny spots using hand sanding, slow speed sander or light wire wheel.

CONCRETE - New concrete or masonry must be thoroughly cured for a minimum of 28 days before attempting any surface coatings. Moisture content should be under 15% to be successful. Grit blast using a medium to fine grit to include a minimum anchor depth profile of 50 microns (.002"). Other forms of surface preparations such as grinding and acid pickling can be used but may reduce adhesion strength.

PVC BELTING – Prepare the PVC surface by first wiping entirely to remove contaminants with NR-TR or a non-oil-based solvent. Then roughen to remove all shiny spots using a slow speed grinder with 24 to 36 aluminum oxide sanding disk or stiff wire wheel (< 2000rpm). Avoid tools with high speed rotation as this will result in burning or charring the PVC, negatively affecting adhesion. There is potential to use a single coat of 600R and or less surface preparation, but this requires testing by the user to assure acceptable adhesion.

POLYURETHANE – If the polyurethane has a bonding layer you have the option to move directly to the cement application. If not, prepare the bonding side of the polyurethane by first wiping entirely to remove contaminants with NR-TR or a non-oil-based solvent, then roughen to remove all shiny spots using a slow speed grinder with 24 to 36 aluminum oxide sanding disk or stiff wire wheel (< 2000rpm). Avoid tools with high speed rotation as this will result in burning and charring the polyurethane, negatively affecting adhesion. There is potential to use a single coat of 600R and or less surface preparation, but this requires testing by the user to assure acceptable adhesion.

WOOD – Prepare the dry wood surface by grit blasting to create a profile. Because certain wood can be porous, it is possible to skip aggressive surface preparation and move directly to cement application. Testing should be carried out by the user to determine which preparation method will provide adequate bond strength for their specific application.

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SUMMARY

Cold bond adhesive systems are widely used around the world in varying climates and operating conditions with complete success.

These products are safe and easy to apply, and when used in accordance with this application guide and safety recommendations, will ensure a high-quality bonding process with outstanding results.

The direction for the use of our products are based upon tests believed to be reliable but no warranty is given. Since conditions for the use of this product are beyond the seller's control, all risks are assumed by the user. Please contact your local agent or call Normac Adhesive Products Inc. (905) 332.6455 for further assistance.

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