

58-15 Prime & Bond NT Dual Cure (Project 99-02) (06/99)

Prime & Bond NT Dual Cure is a fifth-generation (i.e., "one-component") dentin bonding agent marketed by the Dentsply/Caulk Company. According to the manufacturer, it is distinguished from other "one-component" bonding agents in that it contains extremely small filler particles. These 7-nanometer fillers are the basis for including "NT" in the product's name: "NT" for "nano-technology." Although Prime & Bond NT Dual Cure is described as a "single-component" product, it consists of a 34% phosphoric acid etchant, an acetone-based, nanofilled Adhesive Resin, and an acetone/ethanol-based, sulfinate Self Cure Activator. For doing direct bonding of resin composites, compomers, and veneers, only the etchant and bonding resin are used. For bonding indirect restorations such as inlays, onlays, and crowns, the bonding resin is combined 1:1 with the Self Cure Activator. This converts the material into a dual-cure adhesive. Prime & Bond NT Dual Cure is also recommended for amalgam bonding and as the preparatory step before the cementation of endodontic posts with a resin cement.



The advantages of nanofiller technology are purportedly that it strengthens the adhesive and hybrid layers which increases bond strength and improves marginal integrity. Other improvements to the product's composition include incorporation of a small resin to better infiltrate the dentin surface, a crosslinking agent to strengthen the adhesive, and a higher overall resin concentration which makes it possible to achieve adequate coverage with only one application.

The first step in applying Prime & Bond NT is to etch the enamel and dentin for 15 seconds with the acid etchant. The etchant is removed with thorough rinsing for 10 seconds and the tooth structure is blot dried with a moist cotton pellet. Prime & Bond NT Adhesive is generously applied to the tooth structure for 20 seconds, air dried for 5 seconds, and light activated for 10 seconds. When used for indirect bonding, a 1:1 mix of Adhesive and Self Cure Activator is applied for 20 seconds, dried, and light activated.

Manufacturer:

L.D. Caulk
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(302) 422-4511
(800) 788-4110 FAX
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Suggested Retail Price:

\$185.60 Prime & Bond NT Dual Cure (item number 634353) contains:

- one 3-mL syringe of 34% phosphoric acid etchant
- one 4.5-mL bottle of Prime & Bond Adhesive Resin
- one 4.5-mL bottle of Self Cure Activator
- plastic brush handle and mixing well
- disposable brush tips and syringe tips

Government Price:

\$102.05 Prime & Bond NT Dual Cure (item number and contents as listed above)

ADVANTAGES:

- + Application process is simple and very fast.
- + High bond strength to dentin (31.3 MPa as measured by DIS).
- + Inclusion of Self Cure Activator makes product suitable for indirect bonding.
- + No offensive odor.
- + Instructions are clear with adequate technique description.
- + Is provided with laminated instruction cards.
- + Expiration dates and lot numbers are stamped on individual components.
- + Recommended storage conditions are provided on box.
- + Is provided with a Material Safety Data Sheet (MSDS).

DISADVANTAGES:

- Product is not all-inclusive; basic bonding components such as silane, porcelain etchant, and Dentsply's proprietary Amalgam Bonding Base and Catalyst are not provided.
- Self Cure Activator is difficult to dispense in a controlled fashion because of its low viscosity.
- Box is larger than it needs to be.

SUMMARY AND CONCLUSIONS:

Prime & Bond NT is one of the few "one-component" (ie, "fifth-generation") bonding products that is marketed for indirect as well as direct bonding. This is possible because its Self Cure Activator enables the user to convert the light-activated adhesive into a dual-cure adhesive. However, as is the case with most other "one-component" bonding agents, the product does not come with all the components called for in the manufacturer's instructions. Unless the required components are purchased separately, this limits the product's range of uses. User friendliness is always an appealing feature for bonding agents and Prime and Bond NT does well in this regard. Of eight "one-component" products tested by DIS, Prime & Bond NT was the second fastest to apply, which indicates it is simple and straightforward to use. It also produced a very high bond strength. In fact, this is the first bonding agent tested by DIS that exhibited a bond strength value greater than the value claimed for it by its manufacturer. The product's main distinguishing feature is that it is nanofilled, however laboratory and clinical studies need to be performed to assess if this type of filler results in better clinical performance. **Prime & Bond NT** is rated **Acceptable** for use by the federal dental services.