



FAQ

Frequently Asked Questions **Precision Board** **Machining & Composite Applications**

Manufacturers of Precision Board
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1. Where can I get instant access to Precision Board information, technical data, videos, sample material and other resources?

*On our highly comprehensive website at www.precisionboard.com or our mobile app; **Precision Board Mobile**. Available for iOS and Android devices, visit Google Play or The App Store for a free download.*

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2. What's new with Precision Board?

Precision Board allows for "Low to No Dust" CNC machining. See Onsrud Router Bit Selector Guide for speed, feed, and chip settings at www.precisionboard.com.

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3. What is the difference between PBLT & PBHT?

The only difference between the two products is PBLT has been designed to withstand composite oven/autoclave curing temperatures of up to 200°F, 94°C continuously and PBHT is designed to withstand composite curing temperatures of up to 300°F, 149°C continuously. Neither PBLT nor PBHT outgas at these temperatures.

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4. Are there specific oven/autoclave ramping procedures necessary for Precision Board during the heat up and cool down cycle of curing?

Yes. Precision Board, being an organic material, is not a heat conducting substrate like aluminum or steel, and therefore must be heat cycled differently. Precision Board takes longer than metal to completely absorb heat into it during the heating cycle. It also releases heat slower than metal during the cool down cycle.

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5. What is the typical oven/autoclave ramp up and ramp down procedures?

Temperature ramp up should not exceed 1°F per minute. This allows the temperature to be evenly absorbed during heat expansion, which will reduce the possibility of internal stress and warping. Temperature ramp down should not exceed 2°F per minute. This allows the temperature of the tool to come down slowly, so contraction does not cause internal stress and cracking in the thin sections of the tool. In thick tools with thin webs or sections, the cool down should be even slower. Prior testing is always recommended before heat cycling on the actual tool.



6. Are the ramping temperatures different for LT or HT?

No. When in doubt with either material, extend ramping times.



7. What is the primary use of Precision Board Urethane Tooling Board?

Precision Board has been formulated for composite laminate layup tools, check fixtures, prototype models, thermoforming tools, foundry patterns, trim fixtures, CNC program proofing substrates, theme park characters, concept cars, and many other applications. Precision Board is very versatile. Both PBLT & PBHT have been developed for these applications. Both products are now formulated with "Green" Eco-Friendly components.



8. What does "Green" eco-friendly components mean?

Precision Board now has Eco-Friendly, environmental safeguarding, Green components. This state-of-the-art formula is not only easier on the planet, but also has a much tighter, finer cell structure, making it much cleaner to machine with more chips, less dust. Carbon footprint = 3:1. Rapidly Renewable Content of 23.9%. No VOC's, non-toxic, totally inert, and no carcinogens. Made in the USA.



9. What is outgassing and what causes it?

Outgassing occurs when a urethane tooling board, other than Precision Board, is used to make a composite layup tool, which is then heated during curing of the composite laminate. When a typical urethane tooling board is heated, it outgases, which releases by-products that keep the composite laminate adhesive from curing. This ruins the composite laminate and can damage the urethane tool. Precision Board does not outgas.



10. Are there any machining differences between LT and HT?

No. Both products machine very well and at high feed rates. Check out recommended speeds, feeds and chip load on our website www.precisionboard.com.



11. Is either PBLT or PBHT abrasive?

No. Precision Board both PBLT and PBHT contain no abrasive components or fillers. This means standard high-speed steel (HSS) cutting tools may be used.



12. What size sheets are available?

Standard sheet sizes are 20"x60", 24"x60", 30"x80", 48"x60", 4'x8', 4'x10', 5'x8', 5'x10'. Thickness of 1/2" to 24", in any increment of thickness. Custom sheet sizes and thicknesses are available.



13. Are custom bonded blocks and sheets of Precision Board readily available?

Yes. Coastal Enterprises will fabricate any size and shape, small to extra large, sheet or block tool to meet your specifications. We can even bond custom step tools to near net shape configuration. This allows you to immediately start the machining process on arrival with no bonding delay. Custom bonding not only reduces machine time but saves on material costs as well. Fast turn around times are our specialty.



14. What standard densities are available?

Standard densities are: 4pcf, 6pcf, 8pcf, 10pcf, 12pcf, 15pcf, 18pcf, 20pcf, 25pcf, 30pcf, 34pcf, 40pcf, 48pcf, 60pcf, 70pcf and 75pcf. Custom densities available upon request.



15. What is Precision Board made of?

Precision Board is a specially formulated polyurethane based material that is designed for higher curing temperatures than with standard urethane tooling boards. Both PBLT & PBHT are uniquely formulated with and is a certified "Green" material.



16. How much vacuum pressure will Precision Board withstand?

Both PBLT and PBHT, at maximum service temperatures, should not be subjected to pressures over 30psi. The lower the maximum curing temperature, the higher the pressure both materials can tolerate. It is always best to test for deformation pressure in the actual oven/autoclave and at curing temperature being used to determine specific maximum pressure.



17. What is the CTE of PBLT and PBHT?

Both materials have a CTE in the range of 26×10^{-6} . Consult the individual Data Sheets for specifics. Call us if you have any questions.



18. Is it necessary to hold down or "dog" Precision Board to the vacuum table or oven support fixture during heating & cooling?

Yes. Due to the internal stresses that are occurring in the tool during the heating and cooling part of the cure cycle, it is important to hold the Precision Board tool flat. However, due to the differential of expansion and contraction between the Precision Board lay up tool and the support structure, it is crucial that they be allowed to move independent of each other. It is always a good idea to securely, not excessively, hold PBLT and PBHT tooling to the machining table to support the piece during ramp up and ramp down. Hold down every 2 feet +/- is adequate. Remember not to over tighten which will restrict horizontal expansion and contraction and possibly damage the tool and composite laminate.



19. What is the number of parts pulled should I expect to be able to run on a Precision Board tool?

The number of parts you should expect to run on a Precision Board tool depends on a number of factors, including; Density of the Precision Board, complexity of the tool, amount of heat the tool will receive, coating being used and other important factors. In some cases, Precision Board is used to pull 1-5 prototype parts and in some cases Precision Board tooling can be used to pull multiple parts on a production run. Call us to discuss your specific project



20. Can a Precision Board composite layup tool be used for production runs?

For higher production runs Precision Board tool is most commonly used as a "master tool" to reproduce "production" tooling. This method allows for multiple production tools to be made from one Precision Board master. This is a very effective way to make fast lower cost, production tooling.



21. What can I use to bond Precision Board to make larger sections?

In tooling applications, Precision Board can be easily bonded with high quality epoxy adhesives. Coastal Enterprises makes a very easy to use, machinable grade, high-strength epoxy called EP-76. It machines, sands and carves very smoothly. Contact Coastal Enterprises for more information and helpful bonding tips.



22. What are typical Shore D hardness ratings of Precision Board?

Shore D hardness will vary on density. Call us for specific hardness information or check our online Data Sheets at www.precisionboard.com.



23. Does Coastal Enterprises fabricate custom support fixtures for machining and layup tools?

Yes. Coastal Enterprises will fabricate a support fixture for any Precision Board tool. This support tool can be used for tool transport, CNC machining, lay up of composite laminate, oven/autoclave curing, final inspection, and every other process procedure. Support structures are designed with all direction casters, leveling jacks, and tool hold down attachments that can be tightened during machining, etc. and loosened during oven/autoclave cycling. The custom hold down attachment has independent movement from the table.



24. Do I need a mold release on either PBLT or PBHT if laying up directly against it?

Yes. Mold releases are designed to be used against all tooling surfaces so that after cure cycle, the composite part can be released and removed from the layup tool without damaging the tool or the part. Care must be taken when choosing your release agent that it is compatible with the composite during its cure cycle and will not affect resin cure. Always test a sample part to verify mold release compatibility with your chosen pre-preg or composite laminate.

