

# Information Guide for Tools and Fabrication Techniques



King Plastic Corporation

Our Innovation. Your Imagination.®

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## General Tooling Information

- **Use standard woodworking tools** to repair or fabricate components. Hand routers, drills, circular saws, table saws, drill presses and orbital sanders all work well with King StarBoard® ST. Plug cutters can also be used to plug holes in the material or cover counter sunk/counter bored screws.

**\*Make sure to pilot hole and counterbore or countersink all screws when working with King StarBoard® ST\***

- **Pocket screw jigs** are great for hiding screws.
- **Heat guns** can be used to bend King StarBoard® ST around a radius. Heated **bending bars** also work well for making sharp corners.

\*See videos on [www.kingplastic.com](http://www.kingplastic.com) for more details

- **Circular saw blades.** To create a crisp edge with a circular saw, use a good carbide blade with **60 teeth** for a 10" blade and **40 teeth** for a 7 1/2" blade.
- **Router bits.** Most router bit manufacturers classify King Starboard® ST as a soft plastic. Router bits designed for soft plastics have a bit geometry that allows for a higher quality of cut, although standard woodworking bits will work fine. **Carbide and high speed steel work well.**
- **Up-cut, O-flute router bits** are preferred for their superior chip removal. Down-cut and compression bits can re-weld



*Make sure to pilot hole and counterbore or countersink all screws.*



*Pocket screw jigs are great for hiding screws.*



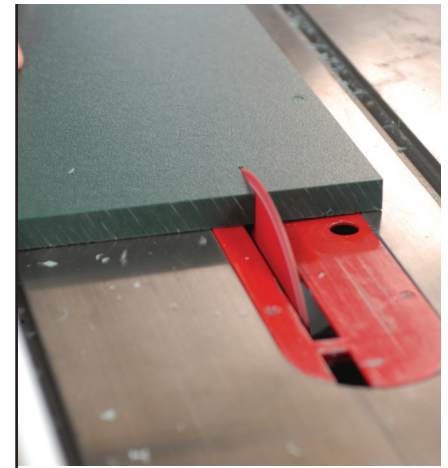
*Heat guns can be used to bend King StarBoard® ST around a radius.*

chips and cause cut quality issues if there is not sufficient room for chip removal.

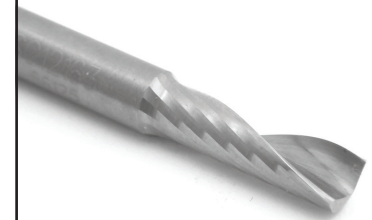
- For **profile bits**, it is best to use bits with a rounded bottom. This helps reduce swirl marks. Chip relief is a major factor in the quality at the bottom of the cut.

## ***CNC Information (General Guidelines)***

- Make sure your tool is chucked up in the tool holder as far as possible making sure **not to go past the shank**.
- It is always advised to do a **sloping lead-in** with a length relative to the depth of cut rather than a plunge. This helps with chip removal and applies less stress to the spindle. Angled, sloping lead-ins can further reduce entry marks on the finished piece.
- **For the best quality cuts**, do not cut deeper than the diameter of the bit in a single pass. This can be ignored if some quality can be sacrificed.
- For bits 1/4"- 1/2" in diameter we use **speeds of 18,000-22,000 RPMs** and **feed rates of 125-250 inches per minute**.
- **Larger bits and profile bits** may need to be ran at speeds as low as 8,000 RPMs and 100 inches per minute or slower.
- When **drilling**, we have found with our machine that "pecking" down with speeds of 4,000 RPMs, 75 inches per minute down feed and .125" per peck provides adequate



*Use a good carbide blade with 60 teeth for a 10" blade and 40 teeth for a 7 1/2" blade.*



*Up-cut, O-flute router bits are preferred for their superior chip removal.*



*For bits 1/4" - 1/2" in diameter, we use speeds of 18,000-22,000 RPMs and feed rates of 125-250 inches per minute.*

chip removal and minimizes chip windup on the bit.

- These speeds vary based on your machine, type of bit, amount of material being cut and the level of quality desired.
- If you feel that a **finishing pass** is necessary we recommend that you leave .015" of material on the initial pass.

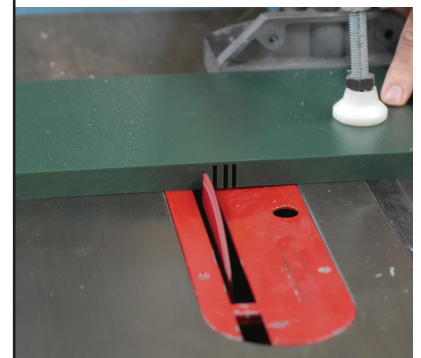
See CNC video at [www.kingplastic.com](http://www.kingplastic.com) for further tips.

## ***Gluing King StarBoard® ST***

- Most woodworkers inherently use glue assemblies.
- Bonding with **glue or adhesives is not a recommended** method. Mechanical fasteners is the best technique for joining King Starboard® ST.
- **Mechanical fasteners** and hardware should be stainless steel for all outdoor and indoor wet area applications to avoid rust and corrosion.

## ***Bending King StarBoard® ST***

- A **bending bar** can be used to produce a tight radius.
- First, cut a 90° groove at the desired bend location. The groove should be cut to a depth that leaves .05-.10" of material. The less material, the smaller the radius.
- The bending bar should be heated to 300-350°F



*First, cut a 90° groove at the desired bend location.*

- Place the part on the bending bar and apply a weight of about 10-15 pounds per foot of part being bent evenly across the surface. The weight can vary depending on the heat of the bar and is necessary to ensure that the part is in complete contact with the bending bar.
- Leave part on bar for 1-3 minutes. Look for a bead forming at the ends of the piece.
- Secure bending bar and remove piece from the bar. Residue left on the bar is common.
- Clamp in place till cooled to ensure the bend holds. Slight over-bending may be necessary as the plastic tends to relax back to its initial position.
- A **heat gun** can be used to heat a part and bend it around a large radius. This takes some time and should not be rushed.
- Apply heat evenly to the part being bent. Do not get too close (stay 8-12" away from surface) or "hover" too long in one area. This may cause scorching and discolor or mar the surface.
- Continue this process until the piece can be bent to form the desired radius.
- Clamp in place till sufficiently cool. Over-bending may be necessary as the plastic tends to relax back to its initial position.



*A bending bar can be used to produce a tight radius.*



*Using a heat gun to bend around a large radius takes time and should not be rushed.*

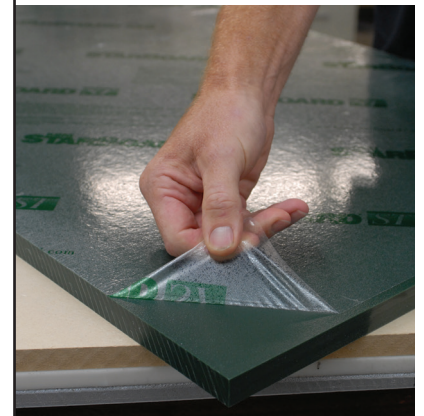
## *Fabricating with Expansion and Contraction in Mind*

- King StarBoard® ST expands and contracts at a rate of 1/32" per linear foot per 40°F **temperature change**.
- **DO** pilot hole and counterbore or countersink all screws. If drastic temperature changes are possible, consider slotting the screw holes.
- **DO NOT** over-tighten screws.
- **DO NOT** install a product between two fixed objects, as this does not allow for expansion to occur and may result in a bowed piece (i.e. an outdoor cabinet tightly fitted between two walls or columns). Make sure to leave space.
- **DO NOT** butt parts together. A t-mold or similar cover can be used to cover the gap.

See [www.kingplastic.com/videos](http://www.kingplastic.com/videos) for more ideas on fabricating with expansion and contraction in mind.

## *Masking*

- King StarBoard® ST is protected on one side with clear .002" (50 microns) thick masking.
- Testing has shown that leaving the **masking on while machining, fabricating and routing** helps ensure a pristine finish.
- The use of this product requires the knowledge of specific fabrication and installation techniques.



*King StarBoard® ST is protected on one side with clear masking.*



## Storage, Cleaning and General Care

- **Store** King StarBoard® ST flat on a level surface.
- Do not stack more than two pallets high.
- Keep **teak oil** and other wood preservatives and stains away from King StarBoard® ST components. They may permanently stain King StarBoard® ST.
- Use **china markers or water-based markers** to draw patterns. Pen marks can usually be removed with household cleaners.
- Keep away from **heat** sources that exceed 180°F.
- **Pressure washing** and common detergents can be used to clean the surface.
- **Nylon scrub pads** and brushes should be used with care because excessive force can mar the finish.
- For resistant stains, apply **bleach** and allow it to soak in.
- Use **citrus cleaner, alcohol or mineral spirits** to remove grease or oil stains.
- Automotive **silicone spray** products or household furniture polish can help to hide scratches on the surface. To prevent slipping, do not use these products on walking surfaces.

See [www.kingplastic.com/videos](http://www.kingplastic.com/videos) for more information on Storage and cleaning.



*Nylon scrub pads and brushes should be used with care because excessive force can mar the finish.*



*Use citrus cleaner, alcohol or mineral spirits to remove grease or oil stains.*

# Why King Plastic Corporation?

## Heritage

King Plastic Corporation began as a small, family enterprise. Founded in 1968, King Plastic Corporation is a leading manufacturer of quality polymer sheets, slabs and massive shapes—including several products pioneered by the company. Its polymers are sold worldwide through a network of top plastics distributors to customers who fabricate products for the marine industry (King StarBoard® brand), signage, food service, healthcare, architectural, industrial and other markets. The company headquarters is a 250,000 square-foot manufacturing facility in North Port, Florida. The King family still maintains independent ownership and control. The same values that made the company so successful in the past still prevail today.

## Innovation

King Plastic Corporation pioneered the first marine-grade polymer sheet, King StarBoard®, which remains the dominant brand in the marine industry today. Since then, King has produced dozens of breakthrough products for a wide variety of industries, from food service to signage to giant slabs weighing more than 6,000 pounds. King continues to raise the bar with new products, new production techniques and new standards of excellence.

## Quality

The King brand is synonymous with quality to those who know plastics. Our quality is achieved and maintained through rigorous development testing, premium materials, tight tolerances, proprietary processes (K-Stran™), thorough inspection, careful shipping, and training and hiring the best workforce in the industry.

## Service

King's commitment to quality doesn't end with products. The company's in-house sales team excels at product knowledge and developing long-term customer relationships. Its worldwide network of plastics distributors includes the best in the industry. Together, they make sure manufacturers and fabricators receive the right material, at the right price, right on time.

## Commodity Product Inventory

While King Plastic Corporation's branded products enjoy a loyal following, the company also produces a wide variety of now-branded "commodity" products, King Performance Commodities. Thanks to expanded production and warehouse facilities, the company now has 200% more products in inventory ready for immediate shipping.

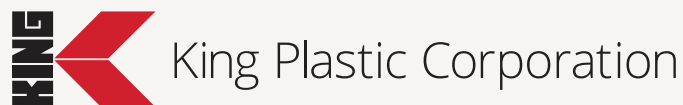
## Warranty

King Plastic Corporation Limit of Warranty is money refunded or defective material replaced. All information and data provided at the time of writing is believed to be accurate and complete, but provided without any guarantee or responsibility of any kind, expressed or implied. It is recommended to pre-test all applications. The user must be aware that other safety measures may be required if not stated herein.



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