

*The Most Beautiful,
Longest-Lasting, High Gloss
Shine for Brightwork*

PETTIT VARNISH



PRODUCTS AND APPLICATIONS



*Exquisitely varnished wood is the reflection
of the most beautifully maintained boats.*

We have all marveled at a beautifully varnished wood finish and probably asked questions on what products were used and the application methods. As a boater, you take pride in the appearance of your vessel. You keep it in pristine condition and feel great satisfaction knowing that it's protected and you know that using a varnishing system

not only enhances the natural beauty of your boat, it also offers an excellent barrier against varying weather conditions, the sea and the UV rays of the sun. You may have also felt slightly intimidated at the thought of undertaking a varnish project. This guide will help you through the process of completing a successful project.



VARNISH: There are three steps to getting a good result –

- preparation,*
- choosing the right products*
- and application methods.*



Start by gathering everything you need to complete the project. Stopping work in progress and having to run to the chandlery to get something cannot always be avoided but if it happens often, it can get discouraging.

NECESSARY EQUIPMENT:

- **Sandpaper** – A range of sandpaper will be needed from 60-grit to 400-grit. Be sure to get enough to be able to change the sandpaper often. Remember sandpaper is less expensive than your time.
- **Plastic Scuff pads** – When sanding edges use a fine plastic scuff pad rather than sandpaper because it will remove less varnish. The green or maroon pads work best.
- **Sanding Blocks**
- **Scrapers** – Scrapers that work by pulling rather than pushing are less likely to gouge the wood. Be sure to round the corners of the scrapers to help avoid gouging.
- **Masking Tape** – Good quality masking tape that can be left on the surface through several coats of varnish is recommended. Do not use inexpensive masking tape, as it will cost you more in time to remove than it will save you money.
- **Tack Cloths** – To remove sanding residue. Cheesecloth dampened with solvent can also be used.
- **Brushes** – While throwaway brushes can be used for stains, sealers and even some of the build coats, use high quality China bristle or Badger hair brushes for finish coats.



SUGGESTED EQUIPMENT:

- **Drop cloths**
- **Finishing Sanders**
- **Paint and Varnish Remover** – To remove old varnish if necessary.
- **Heat Gun** – For varnish removal in places where it would be difficult to use a chemical remover.
- **Vacuum Cleaner** – To efficiently remove heavy sanding residue.

Surface Preparation:

No matter how much the varnish costs, the most expensive part of a varnish job is the time it takes to do the job. Trying to save time and cut corners is where most people go wrong. Preparation is as important as the application of the final coat and will make a difference in the finish.

Previously Varnished Good Condition:

When preparing a previously varnished surface that is in good shape, take into account that some contamination such as wax or silicone may be on the surface and that sanding does not remove contamination. The first step is to clean it well by wiping with a rag dampened with Pettit's 120 or 120VOC-Free Brushing Thinner to remove any contamination. Follow with a clean dry rag. Then sand with 220 to 320-grit sandpaper. Wipe with Pettit's 120 or 120VOC-Free Brushing Thinner again after sanding. You can use a tack cloth to remove sanding residue but always wipe down with solvent after to be certain the tack rag did not leave residue behind. Apply a minimum of two (2) coats of new varnish sanding between coats with 320-grit sandpaper.

Previously Varnished Poor Condition:

If the old varnish is in poor shape, it is best to remove it and start from bare wood. Chemical varnish remover will loosen the old varnish to allow for removal with a wide blade pull scraper. Always use a sharp scraper and slightly round the edge of these tools with a file to avoid gouging the wood. Once the varnish is removed, sand the bare wood with 120-grit sandpaper to open the grain and help the sealer or varnish penetrate into the wood. Always sand with the grain. Remove the sanding residue by wiping with Pettit's 120 or 120VOC-Free Brushing Thinner.

Now follow the Bare Wood instructions that follow.

Bare Wood:

Ensure the surface is dry and clean and has a moisture content between 15-20% before varnishing. Wood that is very dry when varnished, is subject to expansion, cracking, micro-checking and gloss loss when the varnish is in service. Sand the surface with 150 to 220-grit sandpaper. After sanding, clean the sanding residue with a tack rag, vacuum, air hose or cheesecloth dampened with Pettit's 120 or 120VOC-Free Brushing Thinner. Allow Pettit's 120 or 120VOC-Free Brushing Thinner to dry out of the wood. Apply 1 to 2 coats of Pettit EZ-Wood Sealer 2018 over the surface. Sand the surface thoroughly with 220-grit sandpaper.

When making repairs or installing new wood, bed it down so that moisture does not get in and lift the varnish from underneath. A good practice when bedding down trim is to back prime the concealed surfaces with epoxy to prevent moisture from being absorbed into the wood from underneath. Check for moisture in joints. If wood looks black, remove the varnish and use a wood bleach. Then wipe with a fast solvent like xylene to help dry out moisture, sand and give it a final wipe down with solvent. Apply varnish before the wood absorbs more moisture. Excessive moisture in the wood usually leads to blistering of the varnish.

The object of all of the cleaning, scraping and sanding is to obtain a smooth, clean and even surface. Using the proper grit of sandpaper is essential. Trying to remove nicks, dings gouges and other defects with too fine of a grit sandpaper will only lead to frustration. When removing defects, it is easier and faster to start with a coarse sandpaper, such as 60 or 80-grit, and then work through to the finer grits of 180 or 220-grit. Conversely, sanding varnish that is in good condition with too coarse of a grit will result in unnecessary work.



Sealing the Wood:



Many varnishers will use a thinned coat of the varnish they intend to finish with as a sealer coat. This method is perfectly acceptable, but using a clear sealer such as Pettit's EZ-Wood Sealer 2018 will yield better results. Pettit's EZ-Wood Sealer 2018 is used to seal all types of raw wood prior to varnishing. The sealer acts as a moisture barrier layer to

prevent peeling and excessive absorption of vehicle from varnishes. It uniformly seals and satisfies the absorbency of all woods including teak and mahogany. It can be used in a wider range of temperatures and dries faster than varnish. After applying Pettit's EZ-Wood Sealer, lightly sand to a smooth surface before applying varnish.

Applying Sealer:

1. Ensure the surface is dry and clean.
2. Sand the surface with 180 to 220-grit sandpaper.
3. After sanding, clean the sanding residue with a tack rag, vacuum, air hose or Pettit's 120 or 120VOC-Free Brushing Thinner.
4. Apply 1 to 2 coats of Pettit EZ-Wood Sealer 2018 according to directions.
5. Allow sealer to dry per product requirements.
6. Sand thoroughly with 220-grit sandpaper



Applying the Varnish

You've prepped your surface, applied paste wood filler stain and a sealer, but the job's not done yet. It's time for the final act, applying the varnish.

1. Choose a dust-free (or as close as possible) environment. If working outside, do not work in direct sunlight or windy conditions.
2. Ensure all post sealer sanding residue has been removed with a tack rag, vacuum or air hose.
3. If applying by brush or roller, add 10-15% of Pettit's 120 or 120VOC-Free Brushing Thinner for the first coat. If applying with a spray gun, add 10-15% of Pettit's 121 Spraying Thinner for the first coat. In either case, only the first coat of varnish should be thinned.

Varnished Wood in Poor Condition:

1. Remove all the old varnish with a paint and varnish remover or by sanding.
2. Bleach the wood if necessary to remove water stains.
3. Proceed with the application system for bare wood shown on the next page.



Bare Teak: (or other woods with high oil content)

1. Sand the wood smooth with 120-grit production paper to open up the grain. Wipe the surface thoroughly with Pettit's 120 or 120VOC-Free Brushing Thinner in an effort to aggressively remove as much oil as possible.
2. Apply a generous coat of Pettit 2018 Clear Sealer. After an overnight dry, lightly sand the surface with 220-grit sandpaper and wipe it clean with a rag dampened with Pettit's 120 or 120VOC-Free Brushing Thinner.
3. Apply at least four to five coats of varnish. Let each coat dry overnight, sand with 220-grit sandpaper, and clean off sanding residue with a tack rag before applying the next coat. Sand the next-to-last coat with 400-grit production paper prior to applying the final coat.

It should be noted that wood with a high oil content may eventually experience adhesion problems, as there is no way to totally eliminate the oil and prevent it from migrating to the surface. However, this application technique has proven successful in most circumstances.



Bare Wood:

Apply at least four to five coats of varnish. Let each coat dry overnight, sand with 220-grit sandpaper, and clean off sanding residue with a tack rag before applying the next coat. Sand the next-to-last coat with 400-grit production paper and clean off sanding residue with a tack rag before applying the final coat.



Varnished Wood in Good Condition:

1. Wipe old varnish with Pettit's 120 or 120VOC-Free Brushing Thinner to be sure all dirt, wax, polish and/or grease has been removed.
2. Thoroughly sand the existing varnish with 180 to 220-grit production paper and wipe clean with a tack rag.
3. Apply at least two coats of varnish. Let the first coat dry overnight, sand with 400-grit sandpaper and clean off sanding residue with a tack rag before applying the final coat.



Expert Tips:

- If the surface shows signs of deterioration, flaking or peeling, the varnish will need to be removed by either sanding or scraping.
- When using a chemical stripper, scrape the old varnish first and then sand with sandpaper. This will help the Paint & Varnish remover penetrate the coating faster and make it easier to remove.
- All recommendations for sandpaper in this guide are for production sandpaper. Other types of sandpaper may cut into the surface differently, so grit recommendations may be different. Others may have a stearate coating that may cause bubbling in the varnish.
- Always wipe with a rag that has been dampened with solvent after sanding to help remove sanding residue.



- Varnish jobs tend to fail first at the edges of the wood. This is because there is less film thickness on the edge than on the flat piece of wood. Therefore, it is best when sanding edges to use a fine Scotch-Brite pad rather than sandpaper. Bronze wool can also be used. Do not use steel wool, as it may leave particles behind that can rust.
- When working outside, it is best to varnish in the morning after any dew has been removed from the surface. Varnishing late in the day can lead to poor drying and loss of gloss.
- Never file or sharpen a scraper where the filings are likely to end up on an area that is going to be varnished or painted. These filings will turn into rust spots.

How do I eliminate brush strokes?

To eliminate brush strokes, focus on small areas. Always brush into the “wet edge”, that is, don’t start a fresh brush-load of varnish from the previous brush-load, but rather brush into the previous brush-load. This will help to eliminate brush-marks and overlaps that may occur if you are brushing out of the “wet edge”. Try not to varnish in direct sunlight or in very warm, breezy weather conditions. If needed, thin the varnish 5-10% with Pettit’s 120 or 120VOC-Free Brushing Thinner to improve flow-out.

How many coats of varnish do I apply?

When applying to bare wood, a minimum of four (4) coats is required; when applying over existing varnish, a minimum of two (2) coats is required.

What is the required thickness of each coat of varnish?

The thickness of each coat is dependent on the product being used.

- 1015, 2067 and V-975 should be applied in thin coats of no more than 3 wet-mils.
- 2015 and 2056 can be applied in a slightly heavier coat of up to 4 wet-mils.

All coats should be allowed to dry overnight before sanding or recoating.

What happens if I get drips or dust in the finish?

Drips can occur when a coating is applied too thick. To prevent drips, apply thin coats. Applying several thin coats will often provide better results than a few thicker coats. If drips do occur, sand them out with 220 grit sandpaper with a slight overlap to the surrounding finish. You can then apply a new coat of varnish across the entire surface to even out and blend the appearance.

Should dust get into the wet coating, allow it to dry completely. Once the coating is dry, sand back the surface just enough to remove the contaminants that have become lodged in the coating. Make sure to overlap the surrounding finish to even it out and then apply a new coat of varnish making sure to blend the appearance.



Why is the varnish taking so long to dry?

There are some very common reasons why it may take longer than described for the varnish to dry.

- High humidity or excessive moisture in the air, can prevent proper drying of varnishes. If it is very humid out and you can wait until the next day to work on the project, try to do so. If not, bring your project into an air conditioned area or a room with a dehumidifier. Be sure to have the air conditioner pulling in air from the outside, not re-circulating indoor air, as poor ventilation will also extend dry times. Do not blow air directly onto the freshly varnished surface, as this could lead to hazing of the varnish film.
- Applying thick coats, or excessively applied paint films, will take much longer to dry, due to solvent entrapment. This occurs when the outside of the paint film dries faster than the inside, trapping solvents. The product will eventually dry, just wait it out. The varnish will become harder and more durable over time as the solvents leave the film. Apply varnishes at the recommended wet film thicknesses mentioned earlier.

- Temperatures 50°F and below will extend drying times considerably. If you are under time constraints, we suggest moving your work to a warmer area. Applying varnish and allowing it to dry in a warmer workspace will increase its drying rate.



Why are there bubbles in my varnish after I have applied it?

Bubbles can occur when applying varnish with a brush because the action of brushing can agitate the surface and introduce air into the finish. Over-brushing will introduce even more bubbles. The more you work a section, the thinner the film becomes and the faster the solvent evaporates, which does not leave enough time for the film to self-level. When this happens, brush marks and bubbles aren't able to level themselves out. To prevent this from occurring further, apply 10 to 15% more Pettit 120 or 120VOC-Free Brushing Thinner to the varnish. This will allow the varnish to dry slower, giving it more time to self-level. If you do thin the varnish, additional coats may be necessary to maintain the same protection as full strength coats because the added solvent will reduce the amount of resin in the varnish. This method may be a bit more time-consuming but it will prevent air bubbles and yield a better finish. Occasionally even a good-quality natural bristle brush, such as a Badger hair brush, may induce bubbles into the varnish. If, after thinning the varnish as described above, you continue to see bubbles in the varnish, try changing to a high-quality white China or black China bristle brush for the next coat.



Pettit Marine Paint provides the very best varnishes suitable for both exterior and interior woodwork:



Captain's Varnish 1015

A favorite among traditional marine industry professionals, this varnish is highly regarded for its reliable service, versatile application, outstanding gloss retention and tough, yet flexible, durability. It has long been recommended for the highest quality work, with

outstanding results and all-around durability. A combination of phenolic and alkyd resins blended with tung and linseed oils provide excellent performance. Its warm, light amber hue will enhance the rich, classic bright work appearance. Captain's is considered by its many users to be the most durable varnish ever offered to the boating trade. Contains ultraviolet absorbers and filters.



Flagship Varnish 2015

With six (6) times more UV inhibitors, Flagship offers the best protection against the sun's damaging rays. A special blend of phenolic and alkyd resins, combined with tung and linseed oils offer excellent performance and

warm, light amber hue. Flagship Varnish contains an ultraviolet light filter in conjunction with a light stabilizer to screen the sun's damaging rays for longer life. Flagship Varnish has the highest build and film depth per coat, as well as excellent abrasion resistance and a high gloss finish.



High-Build Varnish 2056

A high performance varnish designed to be built up to many coats for a deep, rich, mirror-like finish. The phenolic resin combined with tung and linseed oils increase the depth of gloss with each coat. High-Build Varnish contains an ultraviolet light filter in

conjunction with a hindered amine light stabilizer to screen the sun's damaging rays for longer life. A good varnish for building up multiple coats quickly.



Captain's Ultra Clear Varnish 2067

A premium urethane varnish specially formulated for maximum durability and ease of application. The strong ultraviolet inhibitors in Captain's Ultra Clear, help it maintain outstanding gloss

long after ordinary varnishes have faded. Ultra Clear's tough surface provides remarkable resistance against scratching and chipping. Its easy brushability, excellent leveling capabilities and fast build-up are among its many attributes that make it a pleasure to apply. Perfect for cabin soles and decking.



Captain's Satin Sheen Varnish V-975

Specifically designed to enhance the beauty of interior woodwork with its soft, satin finish. Its pale, durable, long-lasting polyurethane coat is water and alcohol-resistant. Satin Sheen is easy to apply and is intended for interior use

only. Captain's Satin Sheen Varnish is preferred by those professionals and do-it-yourselfers who derive pride and pleasure from quality brightwork.



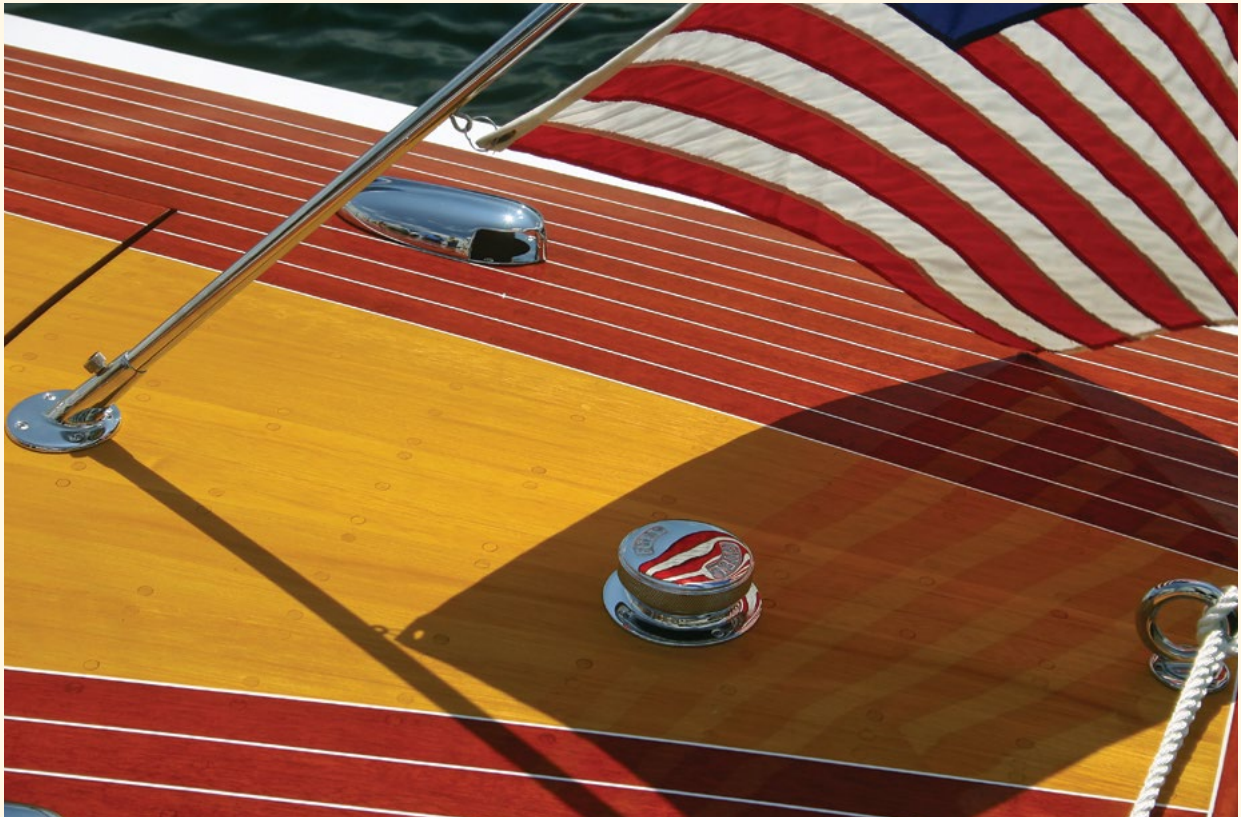
SeaGold Marine Wood Treatment 2040 – New Gloss 2045 – Satin

SeaGold brings Wood Coating Technology into the 21st century. Offering the beauty and durability

of varnish, the ease of use of synthetic wood treatments, all while being low-odor and user friendly. SeaGold protects the wood using UV stable resins combined with added UV inhibitors as well as transparent pigments to provide a long lasting finish that will not turn brown or orange with exposure to the elements. Both original SeaGold with its beautiful satin finish and the new Gloss finish both enhance the beauty of the wood and their translucent amber color does not hide or blur the wood grain.

Pettit Marine Varnish

CHARACTERISTICS and USAGE	P R O D U C T S						
	Captain's Varnish	Flagship Varnish	SeaGold Gloss Marine Wood Treatment	SeaGold Satin Marine Wood Treatment	High-Build Varnish	Captain's Ultra Clear Varnish	Captain's Satin Sheen Varnish
Light Amber Hue	●	●		●	●		
For Added Gloss			●			●	
Exterior Use	●	●	●	●	●	●	
Interior Use	●	●	●	●	●	●	●
Cold Weather Application	●						
Warm Weather Application	●	●	●	●	●	●	●
UV Protection	●	●	●	●	●	●	
Satin Finish				●			●





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PETTIT
VARNISH





Z-Spar Flagship[®] Varnish

Traditional Marine Varnish

- Traditional warm, amber hue with outstanding gloss retention
- Highest build and film depth per coat
- Highest level of U.V. protection
- Extremely durable finish
- Easy to apply



With 6 times more UV inhibitors, Z-Spar Flagship varnish offers the best protection against the sun's damaging rays. A special blend of phenolic and alkyd resins combined with tung and linseed oils offer excellent performance and a warm, light amber hue. Flagship Varnish contains an ultraviolet light filter in conjunction with a light stabilizer to screen the sun's damaging rays for longer life. Flagship Varnish has the highest build and film depth per coat, as well as excellent abrasion resistance and a high gloss finish.

PHYSICAL DATA

PART NUMBER: 2015
 RESIN: Alkyd/ Phenolic
 OIL: Linseed/Tung
 OIL LENGTH: 20 gals.
 UV ABSORBERS: Present
 SOLIDS (theoretical)
 By weight: 55 ± 1%
 By volume: 48 ± 1%
 COVERAGE: 450 sq. ft./gal.
 VOC: 420 g/l (3.5 lbs/gal) as supplied
 FLASH POINT: 108° F.

APPLICATION DATA

METHOD: Brush or Spray
 NUMBER OF COATS:
 Bare Wood: 4 minimum
 Existing Varnish: 2 minimum
 DRY FILM THICKNESS PER COAT: 1.5 mils
 (3.0 wet mils)
 APPLICATION TEMP: 45° F. Min. / 90°F. Max.
 DRY TIME (HOURS):

	Set-to-touch	Tack Free	Dry Hard
90°	1-3 hrs	4-6 hrs	8-12 hrs
70°	2-4 hrs	6-8 hrs	16-20 hrs
50°	4-8 hrs	12-16 hrs	24-48 hrs

THINNER:
 120 Brushing Thinner
 121 Spraying Thinner

ASSOCIATED PRODUCTS

2018 Clear Sealer
 Pettit Paste Wood Filler Stains
 Z-Spar Filler Stains
 120 Brushing Thinner
 121 Spraying Thinner



Z-Spar Flagship Varnish

Traditional Marine Varnish

APPLICATION INFORMATION

Do not shake varnish. Stir gently before application, being careful not to introduce air bubbles into the varnish. Z-Spar 1015 Flagship Varnish may be applied by brush, conventional or airless spray. Thinning is not normally required although on warm days use Pettit 120 Brushing Thinner at 5-10% by volume to ease brushing and maintain good flow and leveling. When spraying, use Pettit 121 Spraying Thinner up to 20% by volume. Spray one even, wet coat to minimize orange peel. Do not apply in heavy films or build coats too quickly as solvent entrapment, blistering or wrinkling may occur. Do not apply Flagship Varnish on extremely humid days or when rain is threatening. Do not apply in the late afternoon when working outdoors as the wet film may be adversely affected by dew. DO NOT apply this varnish to a wood hull which has been dried more than one week under conditions such as artificial heat. Do not use Flagship Varnish below the waterline on boats that remain in the water. The moisture content of the wood should be a minimum of 15% when varnished. This will eliminate expansion cracking, micro-checking and gloss loss when the varnish is in service.

SURFACE PREPARATION

Wood must be clean, dry and properly prepared prior to varnishing. When sanding wood, always sand with the grain. Use a vacuum, air hose, or tack rag to remove all traces of sanding residue. Follow all surface preparation steps carefully, avoiding shortcuts. Inadequate surface preparation will virtually assure inadequate varnish performance.

SYSTEMS

Bare Wood

1. Sand surface completely smooth with 180-320 grit production paper. Wipe surface to remove sanding residue with a tack rag or rag dampened with Pettit 120 Brushing Thinner.
2. For new work on open grained wood such as mahogany, oak, ash, etc. the use of Pettit or Z-Spar Paste Wood Filler Stain is required to achieve a smooth finish. Let dry overnight. For new work on close grained woods such as pine, maple, spruce, etc. the use of Pettit or Z-Spar Paste Wood Filler Stain is not normally required.
3. Apply a generous covering coat of Pettit 2018 Clear Sealer. Let it dry overnight and sand thoroughly with 220 grit sandpaper. On especially rough or porous wood, a second coat of 2018 Clear Sealer may be applied. If applied, sand the second coat as well and wipe the surface clean with a tack rag or a rag dampened with Pettit 120 Brushing Thinner.
4. Apply at least four coats of Z-Spar 1015 Flagship Varnish. Let each coat dry overnight, sand with 220 grit sandpaper, and clean off sanding residue with a tack rag before applying the next coat. Sand the next to last coat with 400 grit production paper and clean off sanding residue with a tack rag before applying the final coat.

Varnished Wood in Good Condition

1. Wipe old varnish with Pettit 120 Brushing Thinner to be sure all dirt, wax, polish and/or grease has been removed.
2. Thoroughly sand the existing varnish with 180-220 grit production paper and wipe clean with a tack rag.
3. Apply at least two coats of Z-Spar 1015 Flagship Varnish. Let the first coat dry overnight, sand with 400 grit sandpaper and clean off sanding residue with a tack rag before applying the final coat.

Varnished Wood in Poor Condition

1. Remove all the old varnish with a paint and varnish remover or by sanding.
2. Bleach the wood if necessary to remove water stains.
3. Proceed with the system for bare wood shown above.

Bare Teak- (or other woods with high oil content)

1. Sand the wood smooth with 120 grit production paper to open up the grain. Wipe the surface thoroughly with Pettit 120 Brushing Thinner in an effort to aggressively remove as much oil as possible.
2. Apply a generous coat of Pettit 2018 Clear Sealer. After an overnight dry, lightly sand the surface with 220 grit sandpaper and wipe it clean with a rag dampened with Pettit 120 Brushing Thinner.
3. Apply at least four coats of Z-Spar 1015 Flagship Varnish. Let each coat dry overnight, sand with 220 grit sandpaper, and clean off sanding residue with a tack rag before applying the next coat. Sand the next to last coat with 400 grit production paper prior to applying the final coat.

It should be noted that woods with a high oil content may eventually experience adhesion problems as there is no way to totally eliminate the oil and prevent it from migrating to the surface. However, this application technique has proven successful in most circumstances.