



# ComClad™ HF

## High Frequency Circuit Material

### Processing Guide

ComClad HF high frequency printed circuit board material consists of Noryl® plastic material as the base dielectric and has excellent electrical performance for use in microwave and RF applications. ComClad HF materials are used in high frequency applications where a low dielectric constant and low loss at a very low cost is desired.

ComClad HF is an adhesiveless laminate which provides a completely homogeneous dielectric and thus very consistent and stable properties over a range of temperatures and frequencies.

ComClad HF can be processed using conventional rigid board processing techniques. Care must be taken with solvents that attack plastics or high temperature (>85°C) processing that may affect the Noryl.

### Process Guidelines

- Storage:** Store materials flat in a clean, cool, dry area to avoid material contamination and copper oxidation. If material will be stored for a significant length of time, keep it in a low humidity environment to prevent copper oxidation.
- Dimensional Stability:** Dimensional stability of the material will depend on the dielectric thickness, copper foil thickness, the amount of copper etched on top vs. bottom (large copper areas will improve dimensional stability), and processing. Avoid or minimize processes that have severe temperature extremes or mechanical scrubbing.
- Drilling:** Use highly polished carbide tools. Do not use repointed tools. Panels can be drilled in stacks based on total thickness. Use a rigid entry board with a thickness of .020"-.030" (.51mm-.76mm) and exit board with a thickness of .060"-.093" (1.52mm-2.36mm). The following feeds and speeds can be used as a beginning point to develop process/equipment specific settings:
- Chip load: 0.002-0.003 inch/revolution
  - Surface speed: 35-60 surface feet/minute (35 for larger holes – 60 for smaller holes)
  - Retract rate: 60-100 inch/minute
  - Tool life: 1000-2000 hits depending on stack height
- Surface Preparation:** Clean holes using a high pressure spray to remove loose debris. Standard chemical cleaning techniques can be used. Avoid or minimize the use of mechanical scrubbing. Do not use solvent based cleaners that attack Noryl plastic.



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<b>Copper Plating:</b>	Standard electroless or direct plate technologies and standard electrolytic copper chemistries can be used.
<b>Etching:</b>	Standard ammonical or cupric etchants can be used. Clean and rinse with warm water.
<b>Resist Stripping:</b>	Standard resist stripping chemistries can be used.
<b>Soldermask:</b>	Screen printed or photoimagable soldermasks are recommended for best adhesion. A copper micro-etch will improve also improve adhesion. UV cured soldermasks are preferred for the lower cure temperature.
<b>HASL:</b>	HASL is not recommended due to temperature.
<b>Surface Finish Plating:</b>	Standard electrolytic plating chemistries of solder and tin can be used. Comclad has not been proven in any electroless chemistries. Due to the variety of plating chemistries we cannot guarantee that ComClad is compatible with all chemistries.
<b>OSP:</b>	Standard OSP (organic solderability preservatives) can be used.
<b>Routing:</b>	Standard end mills can be used. Stack depth should not exceed .120" Typical parameters are a spindle speed of 16,000 rpm and a feed rate of 25 inches/minute
<b>Stamping:</b>	Half hard or full hard tool dies can be used to stamp with thickness of .030" or less.
<b>Assembly:</b>	Soldering assembly can be performed to ComClad but care must be taken. For SMT or wave solder assembly fixtures must be used so only the copper pads are exposed to the reflow profile. Hand soldering must be done with care and quickly.

For more information visit Sheldahl's web page at [www.sheldahl.com](http://www.sheldahl.com) or contact Sheldahl at one of the phone numbers below or email at [comclad@sheldahl.com](mailto:comclad@sheldahl.com)

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