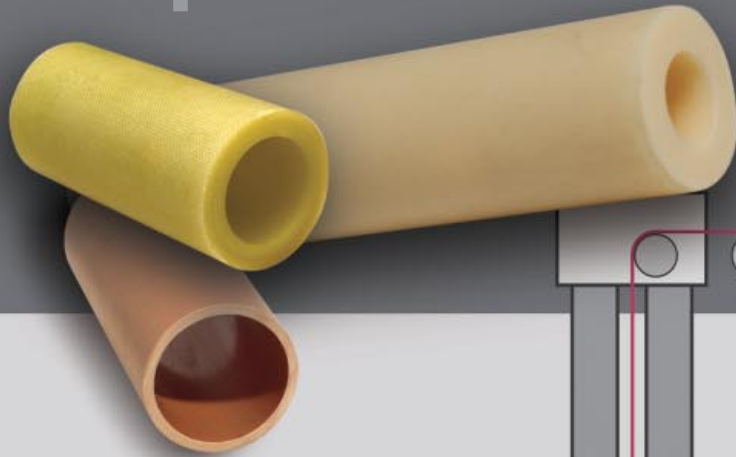
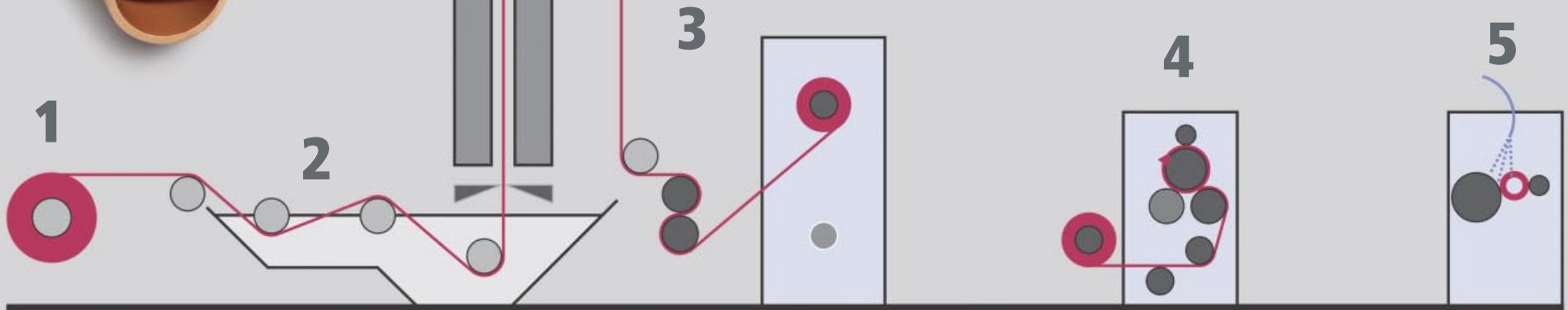


Norplex-Micarta Tubing Manufacturing Process



Norplex-Micarta utilizes state-of-the-art equipment for each step in the manufacturing process, from material preparation and treating to winding and finishing. First, the substrate is processed through the resin compound. Then, the impregnated material is semi-cured in a treater oven. Once the material is treated, it is sent to the tube winding machines (see photo 4 below). Finally, the material is pulled, ground or sanded, then trimmed and packaged as required.



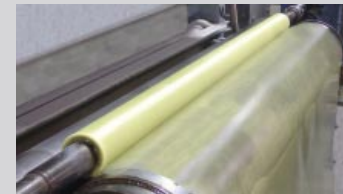
1 Substrate Roll
Norplex-Micarta has the most stringent vendor qualification process in the thermoset laminate industry, ensuring that our customers receive the highest quality and consistency from batch to batch.



2 Resin Metering
Precision-aligned rollers apply and meter resin to the substrate with uniform consistency and fabric wet-out. The system guarantees that the resin will completely penetrate the substrate, filling all voids.



3 Treater/Rewinder
A proprietary computer-controlled treating technology is used for the curing process. Both vertical (illustrated above) and horizontal treaters are available to fit customer process requirements. After treating, tubing products are sent to the rewind system, which ensures consistent tension throughout the process.



4 Tube Winder
Pre-preg is wrapped around precision-ground mandrels with controlled temperatures and pressure to create a convolute-wound tube. Inside diameters range from 0.187" to 48", with wall thicknesses down to 0.031". The tube is then baked to customer specifications.



5 Wet Centerless Grinder
Tubes are wet-ground to meet outside diameter and surface finish specifications. Custom applications for specialty products feature outside diameter tolerances as low as +/- 0.003".