

# Veneer Lathe Systems

The USNR rotary veneer lathe continues to lead the field with engineering innovations and technology advancements. No other lathe produces greater recovery, more throughput or higher quality veneer.

#### Solid Wood Products

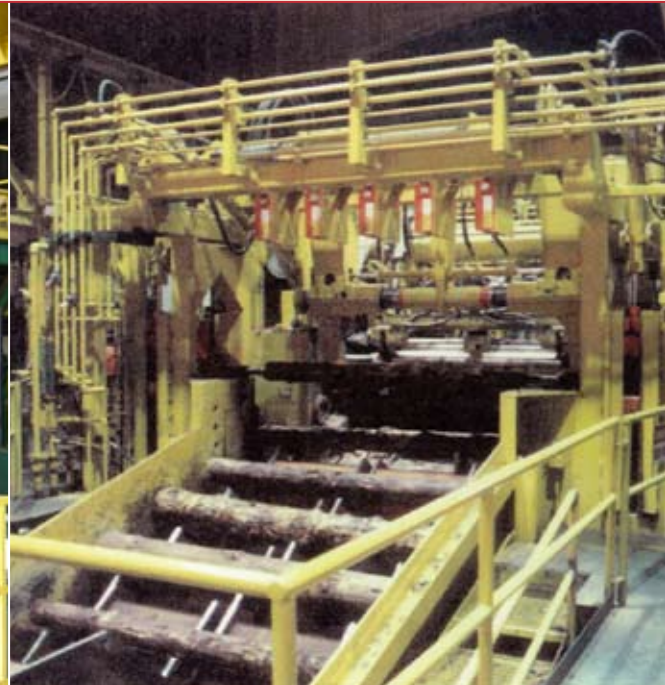
- Sawmill Systems
- Dry Kilns
- Planermill Systems
- Scanning & Optimization
- Machine Controls

#### Veneer/Plywood Products

- Lathe Systems
- Dryer Systems
- Plywood Manufacturing Systems
- Press Systems

#### Customer Support

- Service
- Training
- Parts
- Upgrades



## Veneer Lathe Overview

Cost effective plywood manufacturing is entirely dependent upon the timely supply of high quality, uniformly thick and smoothly peeled veneer. The three critical issues are recovery (% of usable veneer from the log), throughput (volume per hour), and veneer quality (a flat, polished, smooth surface with a minimum of grain pull and knife checking).

USNR veneer lathe systems provide the highest recovery, greatest throughput, and highest quality veneer in the industry. Since introducing the rotary veneer lathe in 1870, USNR veneer lathes have been installed on over 1,200 lathes. Over 90% of veneer in North America is peeled on USNR lathes.

## Veneer Challenges

All veneer mills want to increase recovery, throughput and quality. Unfortunately, the challenges are compounded by a smaller, lower quality log diet. The move to lower plywood manufacturing costs has translated into the utilization of smaller diameter logs and lower density species. Five 6" diameter blocks have to be peeled to 3" core for every one 12" diameter block to produce the same volume of veneer. This puts more demands on the lathe system.

Recovery is the key to profitability as fiber is the single largest cost component. Generating a large volume of quality veneer from the log is the single most crucial plywood manufacturing process.

If quality veneer is not generated at the lathe, nothing else in the manufacturing process will improve recovery, or quality of veneer.

Computer optimization of each block is essential and it is increasingly important to precisely measure surface characteristics to produce a veneer yield surpassing that of traditional cylinder optimization methods.

Peeling at higher velocity tends to improve veneer quality as measured by thickness uniformity and veneer smoothness.

## Veneer Lathe Systems



Section of a block scanned by BlockPLUS



Photo of the same section of the block

### BlockPLUS Profile and Lathe Charger Control System

BlockPLUS can accurately model surface features including knots, holes, dips, catface, butt flare and pistol grip at a resolution of over 100 precise measurements per square inch. With approximately one-half million data points for blocks less than 12" in diameter, the model of the block generated by BlockPLUS system provides a complete representation of the block for analysis. As the block diameter increases above 12", the number of data points collected also increases up to a maximum of approximately 3 million points. This accuracy breakthrough in block profile scanning provides, for the second time in the history of peeling softwood veneer, a quantum advance in recovery.

Carefully controlled tests at a Pacific Northwest mill showed the use of BlockPLUS:

- Increased veneer recovery by 2.7% for Douglas Fir, 3.2% for Hemlock
- Reduced the average round-up time 0.5 seconds
- Shortened carriage retract
- Minimized spin-outs or dropped blocks
- Made the clipping trash gate operate more accurately and consistently.

### Model 796 Computerized Lathe Charger

The Computerized Lathe Charger chucks the geometrically centered block and rotates it for laser scanning while simultaneously raising and repositioning both ends optimally in order to maximize veneer recovery. After the block has been perfectly repositioned, a precision pendulum block transfer device precisely transports it to the lathe spindles. This fast and accurate positioning contributes to production speeds of up to 18 cycles per minute.

Sophisticated centering algorithms adjust to the unique shapes and characteristics of different species. The charger frame is of heavy-duty steel construction to control deflection and accuracy and is designed for direct attachment to the lathe for added rigidity and to assure precise reference between the lathe and charger. Decades of lathe charger experience has resulted in a simple to maintain design with few moving parts.



## Veneer Lathe Systems

### Model 296 Veneer Lathe

The lathe system can be configured to peel 4'/6'/8'/9'/10' length blocks from 4" to 36" in diameter. The USNR Model 296 is the only veneer lathe that can peel down to 2" diameter cores while obtaining maximum veneer from the block. Servo-controlled, ruggedly designed lathe spindles, digital knife location and angle, and peripheral drives are key to providing increased veneer volume and quality.

Multiple spindles allow the lathe to apply maximum torque for large diameter logs and to increase volume and recovery by peeling down to small diameter cores. Dual or triple lathe spindles are available. Precise, staged retraction of large and intermediate spindles insures the smooth transition of torque all the way to core limit.

Extended spindle sleeves provide maximum spindle stability. They carry the bearing closer to the work for less spindle flexure to improve veneer quality.

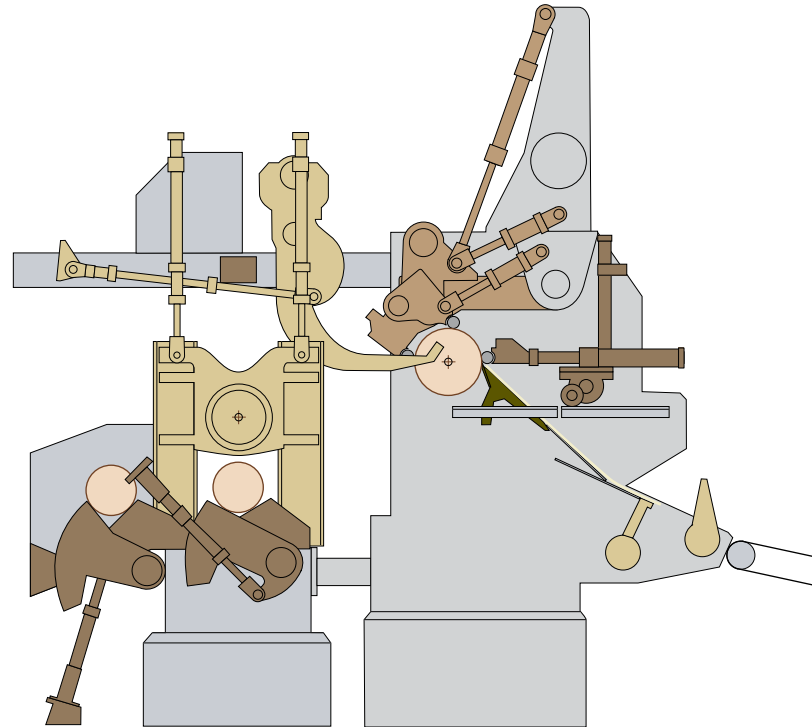
The system provides complete programmable control of the lathe knife's rotational position or "pitch" as a function of temperature, specie, thickness or diameter as the block is peeled.

The new Cast Steel Knife and Pressure Bar and Head components are more robust providing much greater stability.

Two hydraulic cylinders position the veneer knife. This electronic gearbox allows the setup of gross roundup and roundup peel rates to speed roundup prior to transitioning to the target peel rate, thus providing the best opportunity to quickly achieve the first salvageable veneer. The hydraulic digital carriage drive system provides both rapid forward and reverse carriage speeds, as well as multiple peeling thicknesses as standard equipment. Peel thickness adjustments can be made in increments of 0.001". Multiple "on the fly" peel thickness ratios allow different thicknesses for roundup, sap and heart veneers within a block.

The automatic retract feature utilizes the computerized charger output for block profile to accurately park the lathe carriage (retract position) to minimize idle time during the round-up sequence.

Auto round-up automates the operation of the trash gate.



## Veneer Lathe Systems

### Model 1484 Direct Drive Roller Bar

This control allows the Large Roller Bar, or “Big Bar”, to perform its main function of imparting peripheral force to the block in conjunction with the core drive. The large diameter roller bar imparts torque to the block surface, which reduces spinouts and plug-ups by allowing a free pass-through of slivers. The specially designed, fluted roll can provide improved recovery and production, particularly from low-quality blocks.

New servo-controlled vertical bar height adjustment ensures maximum continuous block contact as its being peeled to very small diameters.

Adjusting the roller bar height dynamically while peeling from large diameter to core limit allows “optimal” positioning of the drive roll relative to knife tip. This better fit of knife and drive roll improves veneer quality and reduces the required torque applied by the spindles.

The design permits large lathe spindles to remain in the block longer without contacting the pressure bar drive housings. Additionally, due to the added drive housing clearance, the large spindles can be positioned closer to the block at retract providing added support for the small spindles and decreasing wood to wood time by remaining closer to the ends of the incoming block.



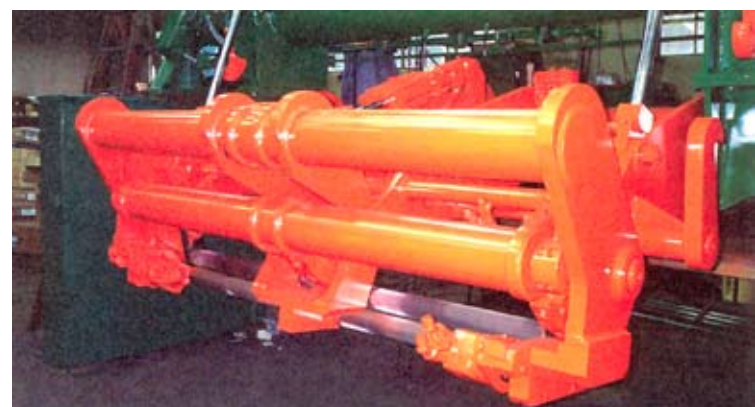
Dual or triple spindles

### Model 1800 Clipping Trash Gate

The Clipping Trash Gate assembly consists of three basic components, a pivoting clipping gate, a patented anvil mechanism, and a lathe outfeed apron assembly. The lever arm and stroke of the cylinders on the pivoting gate are such that ample room for precise acceleration and deceleration control for both open and closed position can be accomplished with minimum mechanical fatigue to the gate, lever arm, and cylinder. The patented Ultra-High Molecular Weight (UHMW) polyethylene anvil mechanism with servo-controlled position adjustment allow it to operate without jamming with veneer and provides ease of maintenance.

### Model 1396 Full-length Core Drive

The Core Drive’s purpose is two fold; first to provide columnar stability to the diminishing core and second to impart peripheral drive to the block as it is being peeled. The Core Drive provides up to 50% of the torque required to peel a block. This combination of stability and drive reduces unwarranted spinouts and improves veneer quality. The Core Drive also assists ejection of the core from the spindles reducing time to “chuck” next block.



Full-length core drive

## Veneer Lathe Systems

### User Interface and Reporting

Correct adjustment of setup parameters and timely management information are key to the proper operation of any modern lathe system. The lathe system's Embedded Webpage Manual provides current values of all setup parameters along with immediate viewing of the related online Owner's Manual pages explaining their purpose and affect, plus typical setup values. A touch screen operator interface provides control of all set-up and self-diagnostic functions.

The Lathe Control System computer uses the scan data, computed positions, carriage position encoder and core drop information to create a management report. The report includes histograms of incoming block size and core drop size, plus tabulation of block scale and cubic volume. This information is presented separately for each shift plus totals for the day.

Through the Ethernet network and/or the internet, additional customer PC's with web browsers can access complete monitoring of machine operation, fault conditions, and the export of management report data.

### Lathe Control System

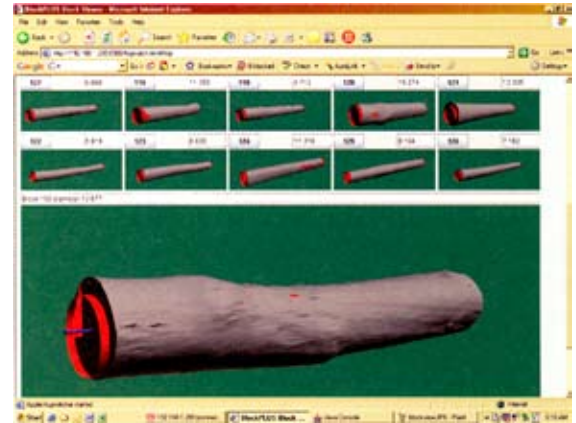
The Lathe Control System hosts both the BlockPLUS Charger Optimization Software as well as integrated, highspeed USNR Lathe Motion Control Software which precisely coordinates the 35 critical lathe peeling axes.

It provides consistent machine operation that is virtually immune to oil temperature, intermittent loading during roundup and other variables that can degrade peel quality. This innovative system controls the axes critical to the proper peeling process, automates much of the lathe setup and provides the operator great flexibility. These controls enable peeling quality veneer at rates approaching 2,000 fpm. The industry standard Allen-Bradley ControlLogix PLC is the controller for the lathe line. Other PLCs are available by request.

### Lathe Experience

- 1870 Rotary lathe
- 1975 Computerized X-Y charger
- 1980 Core drive
- 1984 Laser scanning
- 1987 Electronic pitch rail
- 1987 Hydraulic digital lathe carriage drive
- 1990 High speed lathe
- 1996 Major improvements to the clipping trash gate
- 2002 Major improvements to triple spindles
- 2006 BlockPLUS

Installed over 1,200 lathes



BlockPLUS Control Screen



PLC Control Screen

## Veneer Lathe Systems

### Associated Products

- Coe / Linden Log Ladder
- Lathe operator cabs
- Veneer handling systems
- Primary and secondary tray systems
- Green veneer stacking systems
- Synchronous drive systems

### Aftermarket Support

USNR brings together the resources and experience of two of the most respected industry leaders: Coe and USNR. We have integrated operations from engineering and manufacturing to aftermarket support in order to use our combined resources most effectively and efficiently.

USNR employs over 400 people and operates in seven facilities across Canada and the United States. USNR holds many patents and invests heavily in R&D to ensure our clients benefit from the latest technology.

USNR offers the most comprehensive suite of support services in the industry, and extends this coverage to the Coe product line. Our customer support is dedicated to providing products and services that ensure reliability and enhance the performance of your mill's system throughout its lifetime. We can develop a planned parts, service and training program tailored to your individual needs. Our customer support representatives are committed to work as a part of your team to achieve a high standard of service. Our technologies accurately determine the most relevant characteristics of every piece of wood, then cut and process it with precision.



Coe / Linden Log Ladder