An Introduction to Lumber Manufacturing
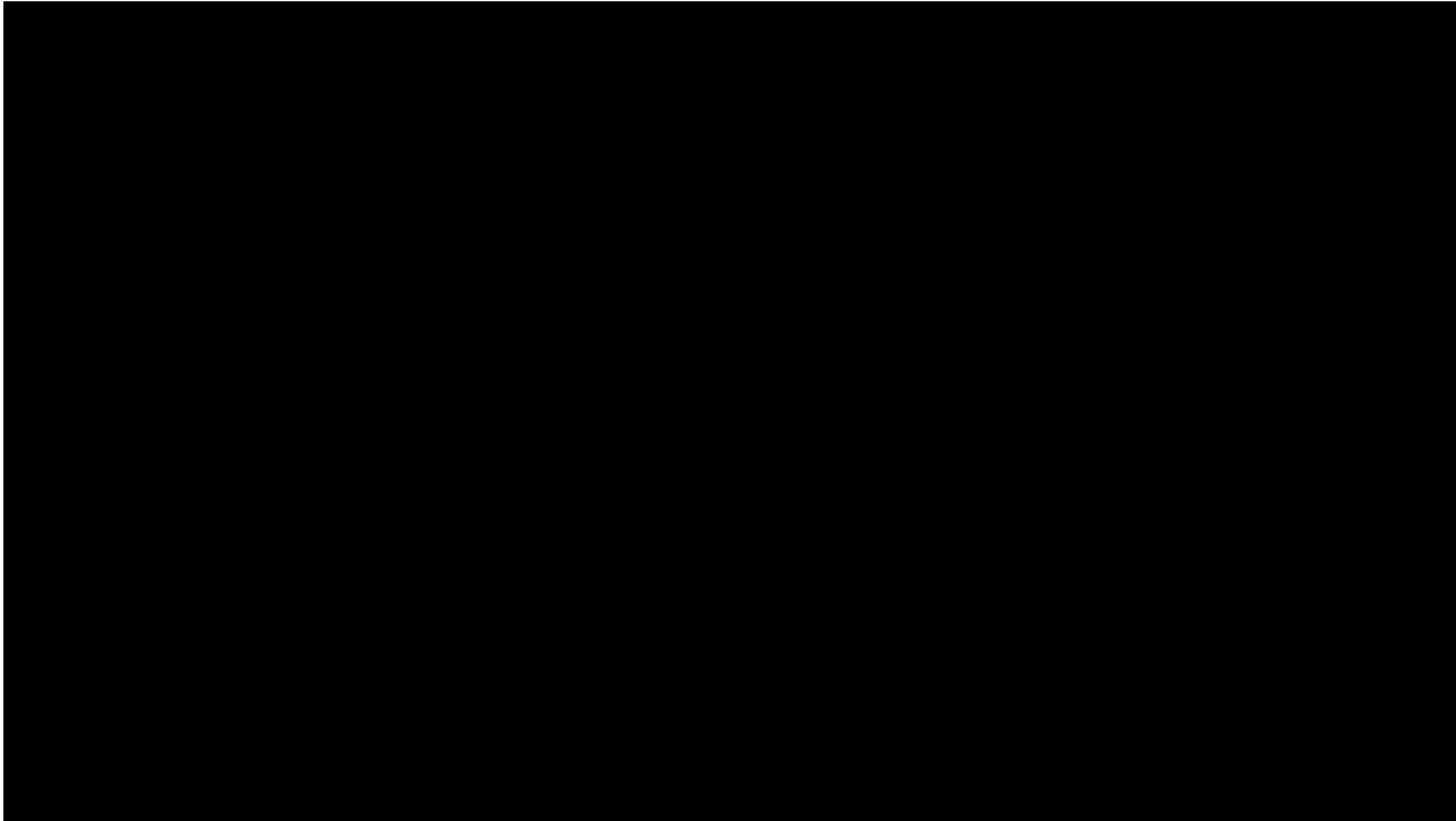
MECH 392

Ahmad Mohammadpanah

ONE OF THE WORLD TALLEST WOOD BUILDING:

https://www.youtube.com/watch?v=GHtdnY_gnmE

THE LARGEST MANUFACTURING SHOW (LIGNA)

https://www.youtube.com/watch?v=rEKftvP9eRA

FROM LOGS TO LUMBERS:

?

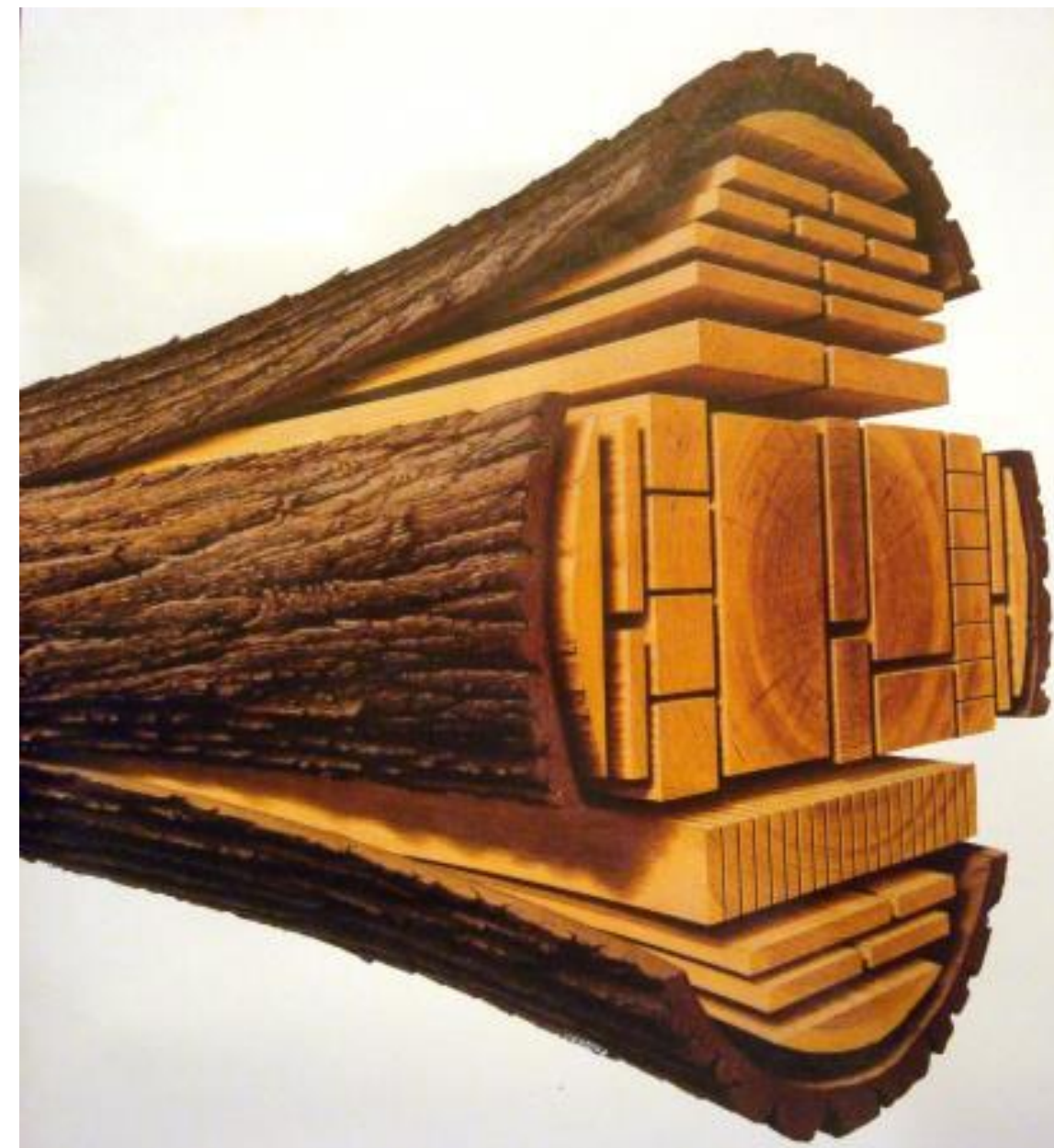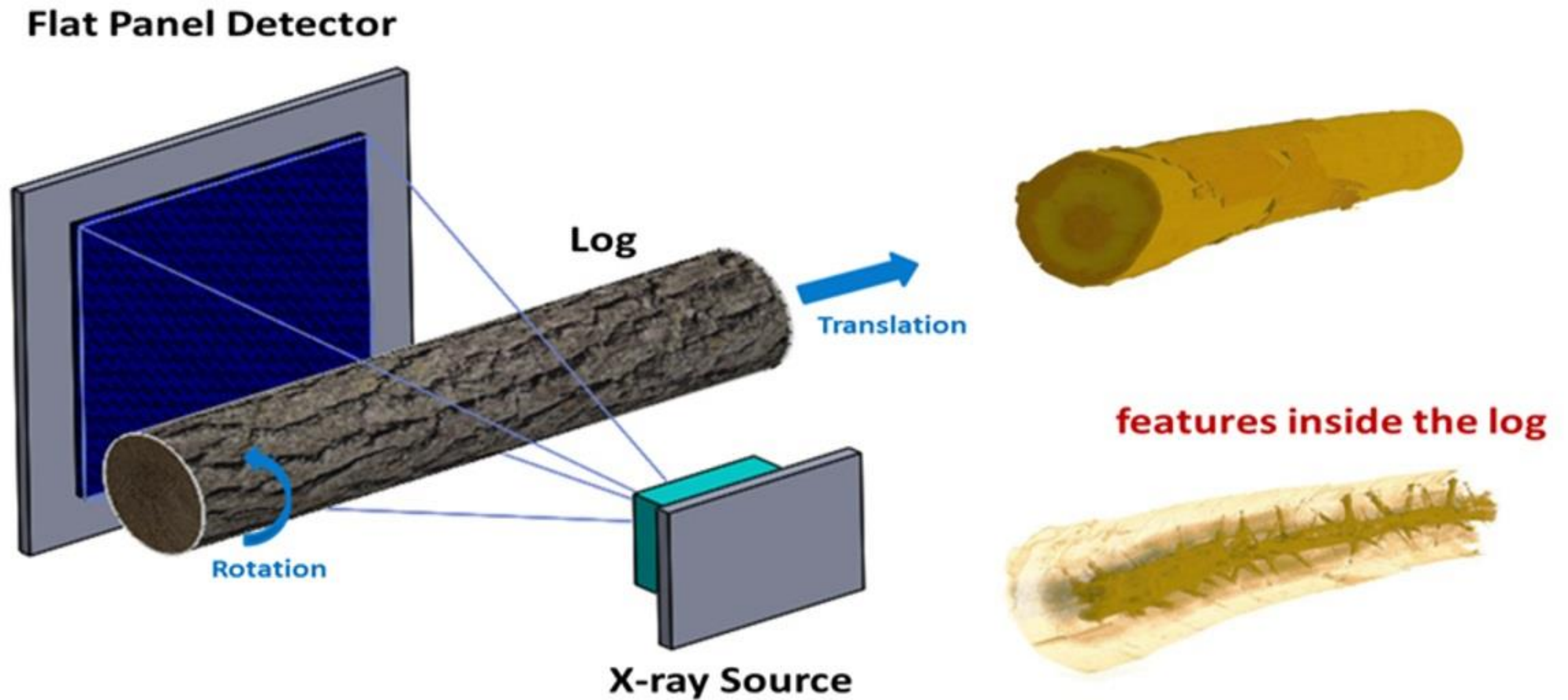https://cottagelife.com/

JUST A LUMBERJACK ?!

https://cottagelife.com/

OBJECTIVE:

To obtain a general understanding of the processes involve in manufacturing solid wood

https://cottagelife.com/

STEP 1. SCANNING

Flat Panel Detector

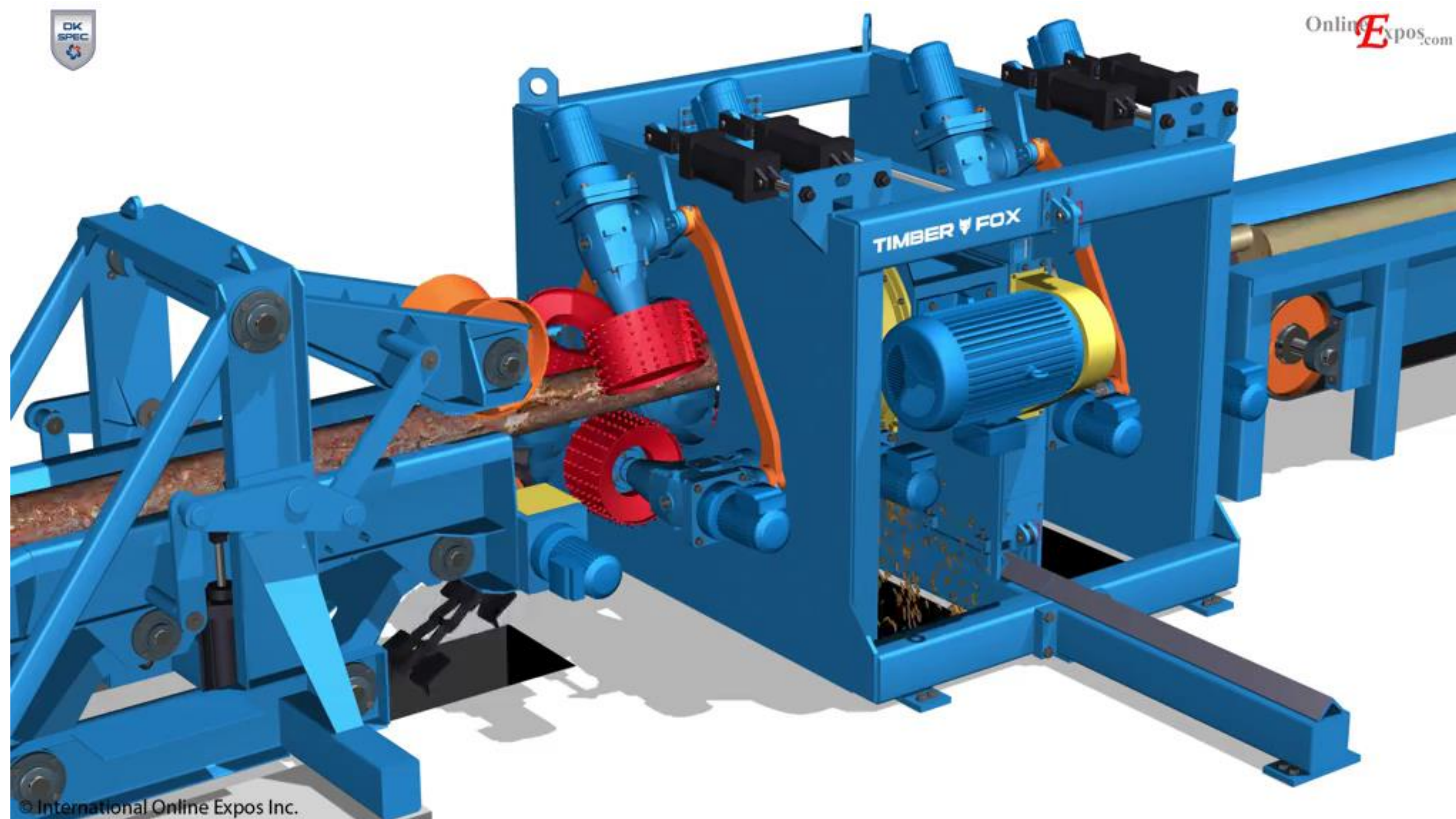Log

Translation

Rotation

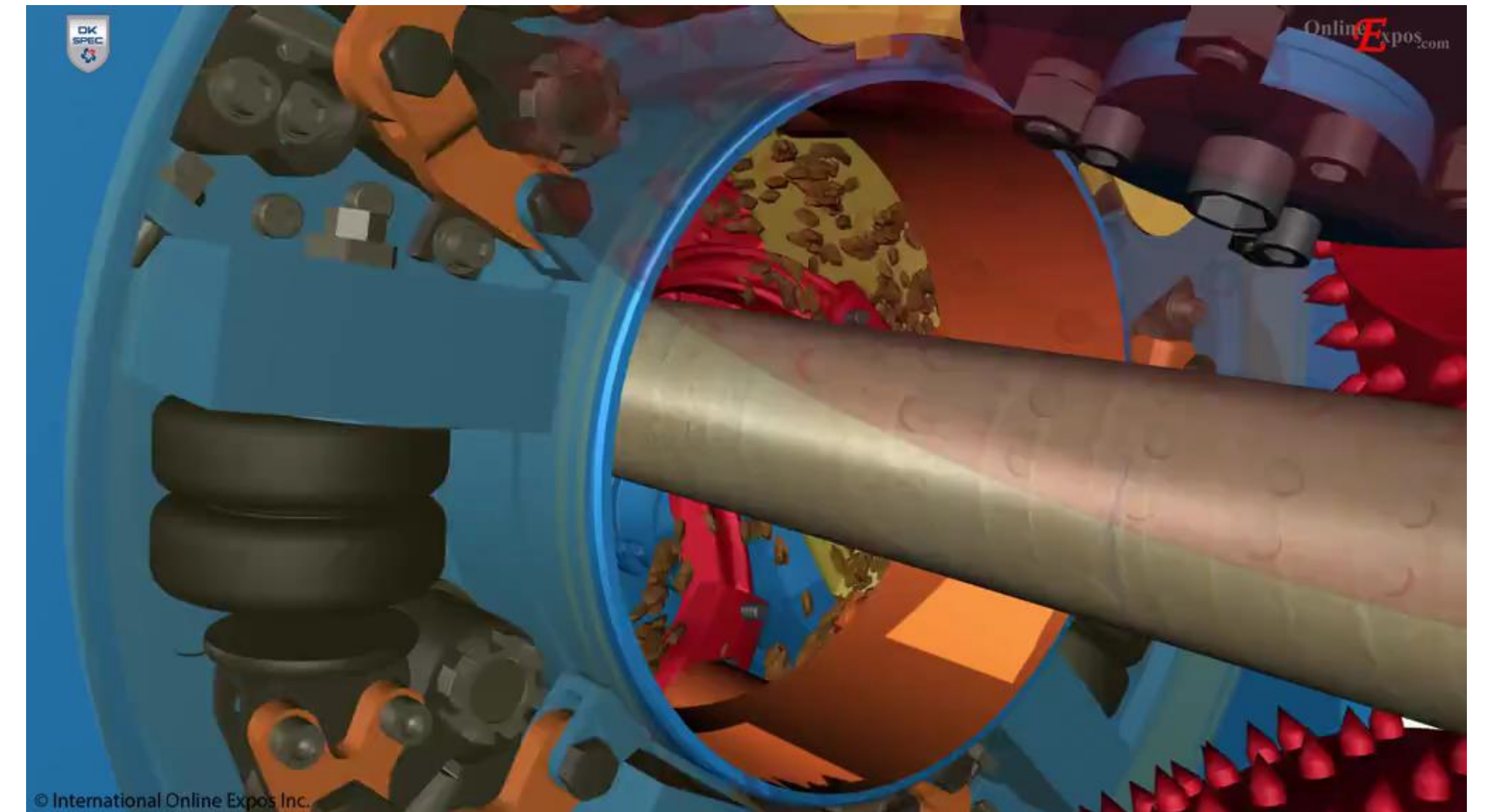X-ray Source

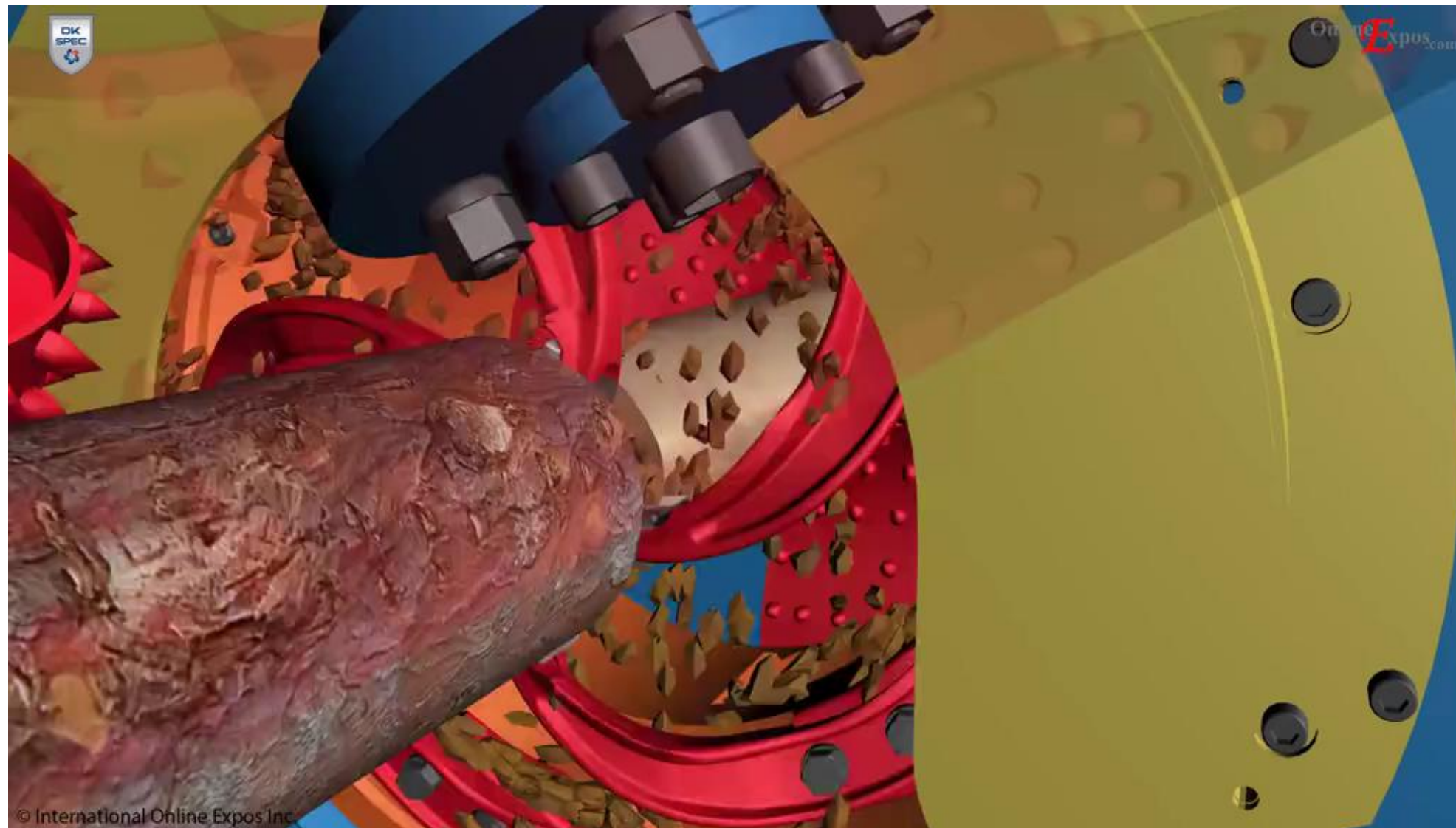features inside the log

STEP 2. DEBARKING

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html
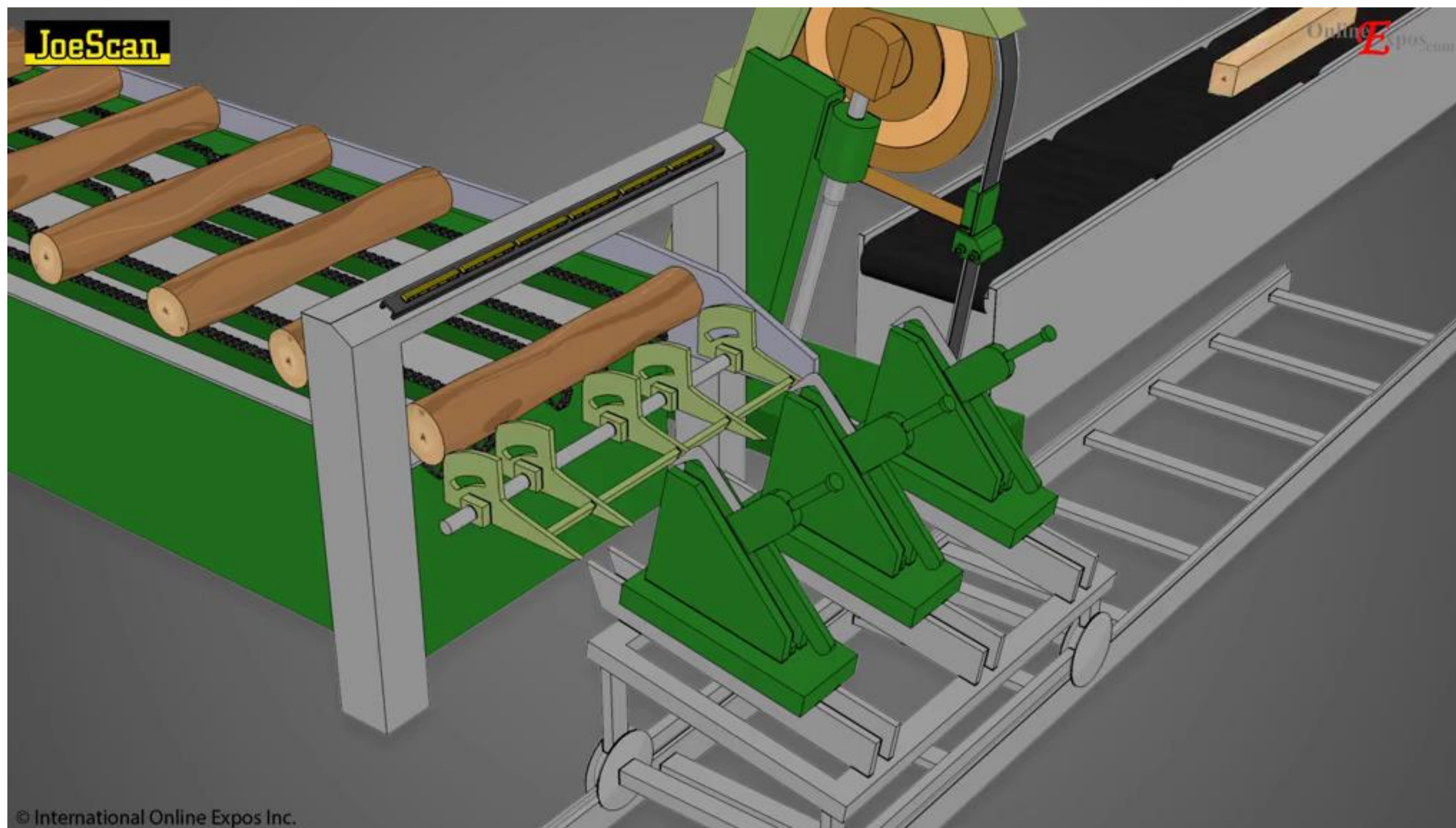
STEP 2. DEBARKING, INFEED, OUTFEED

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html

STEP 3. LOG ROTATION OPTIMIZATION

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html
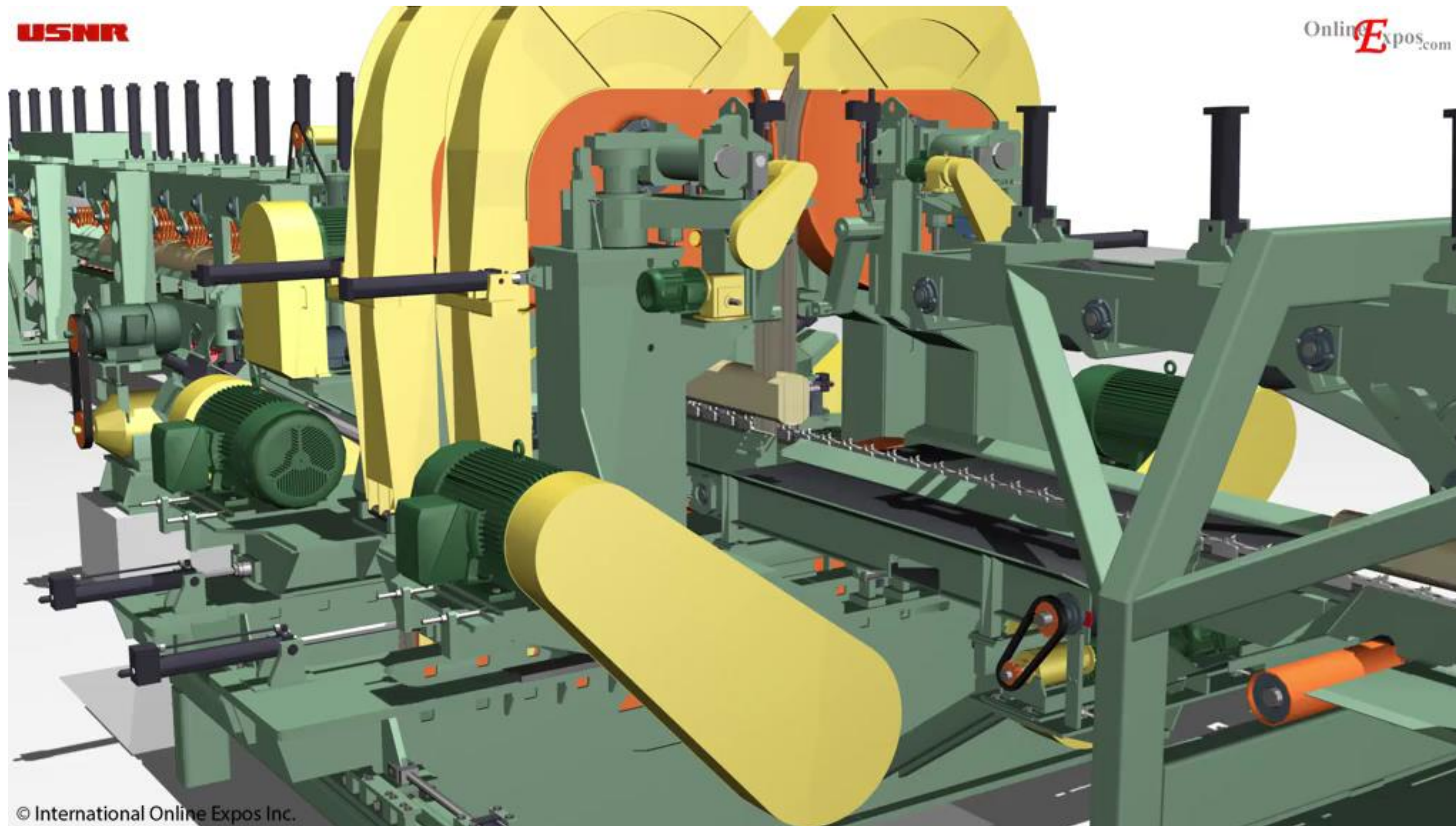
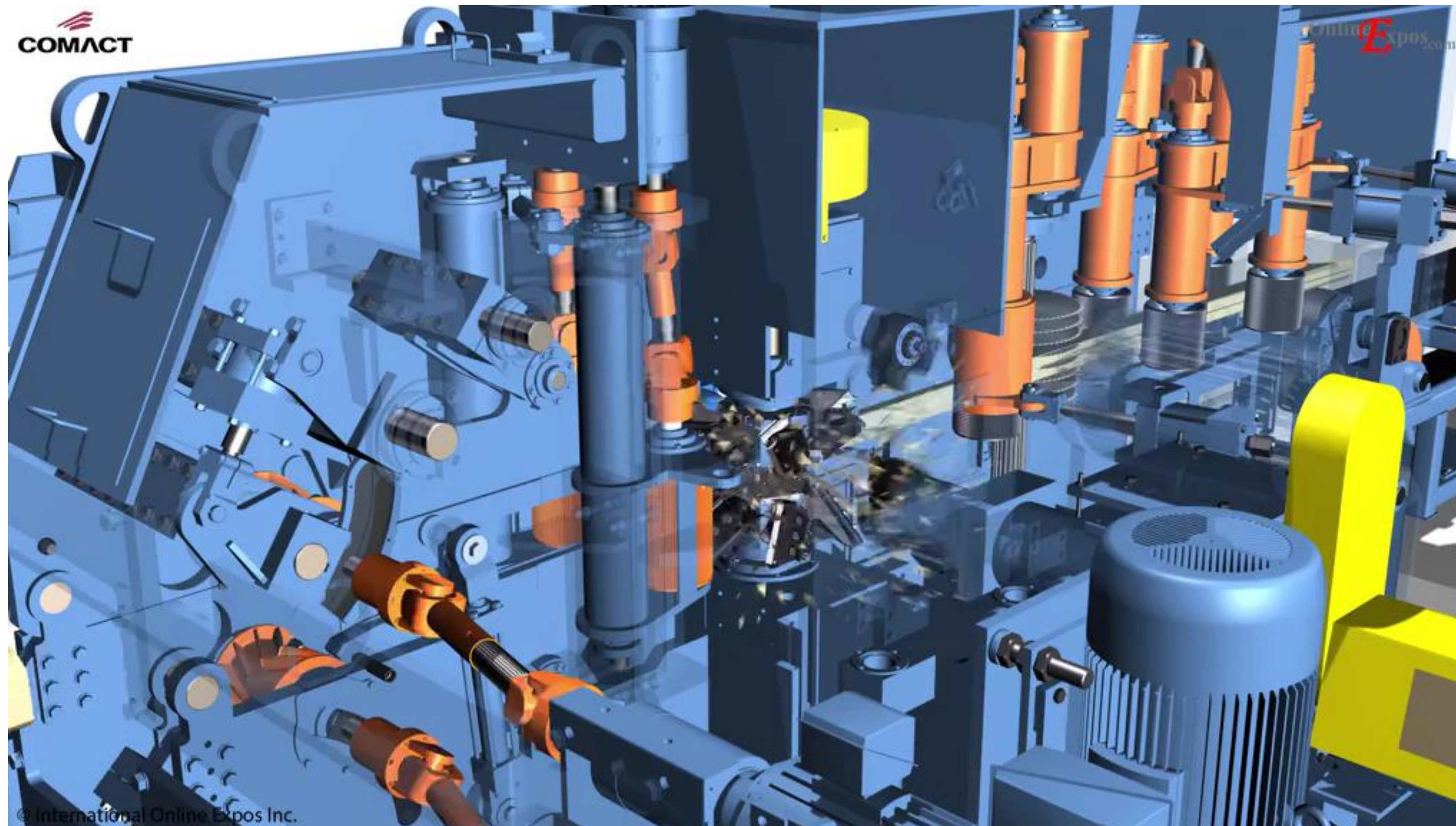# STEP 3. LOG ROTATION OPTIMIZATION

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html

STEP 4. CANTER (TURNING LOG TO A RECTANGULAR CANT)

First: Canter Bandsaw

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html
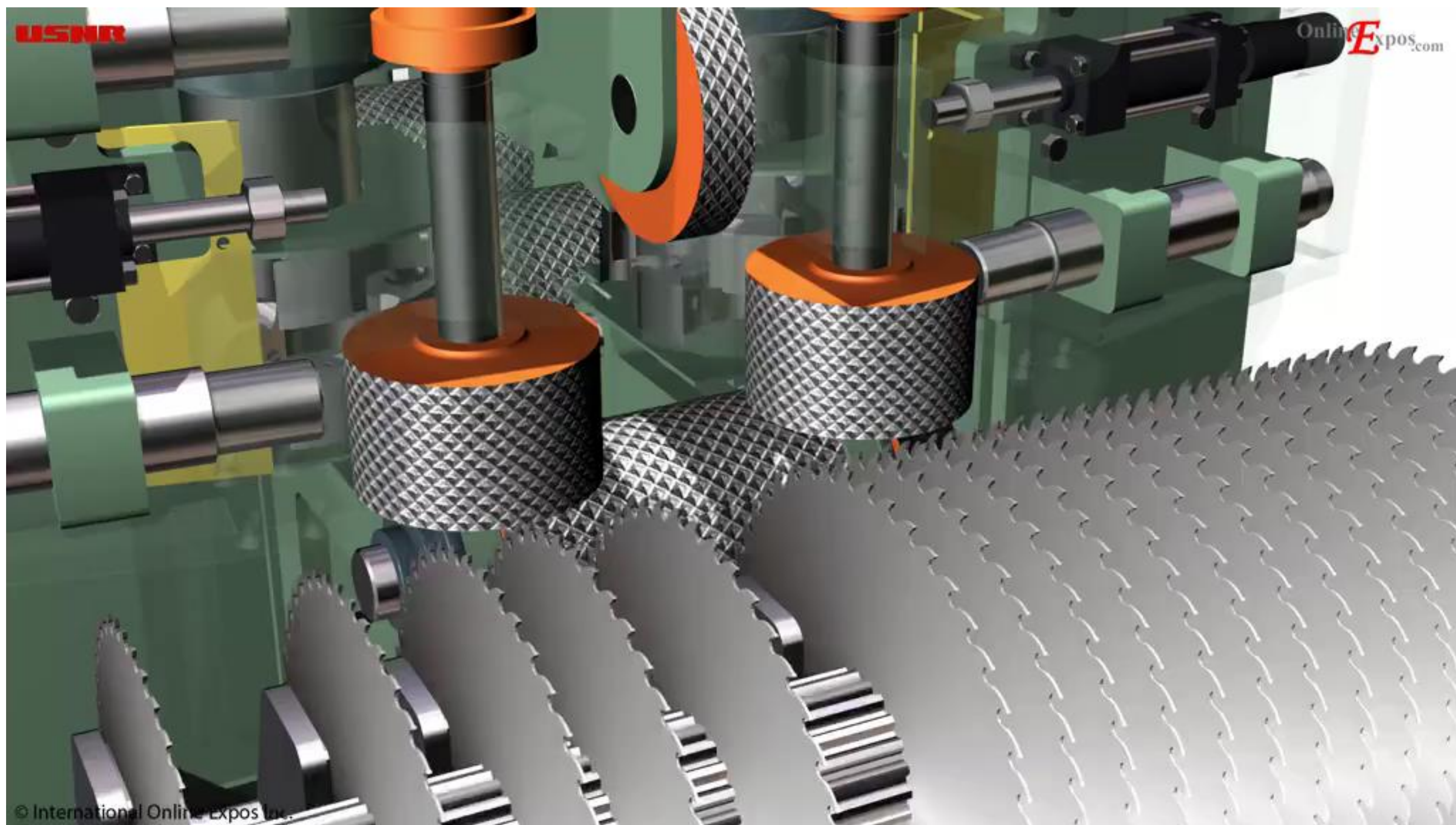
Second: Canter Profile

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html

STEP 5. SAWING

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html
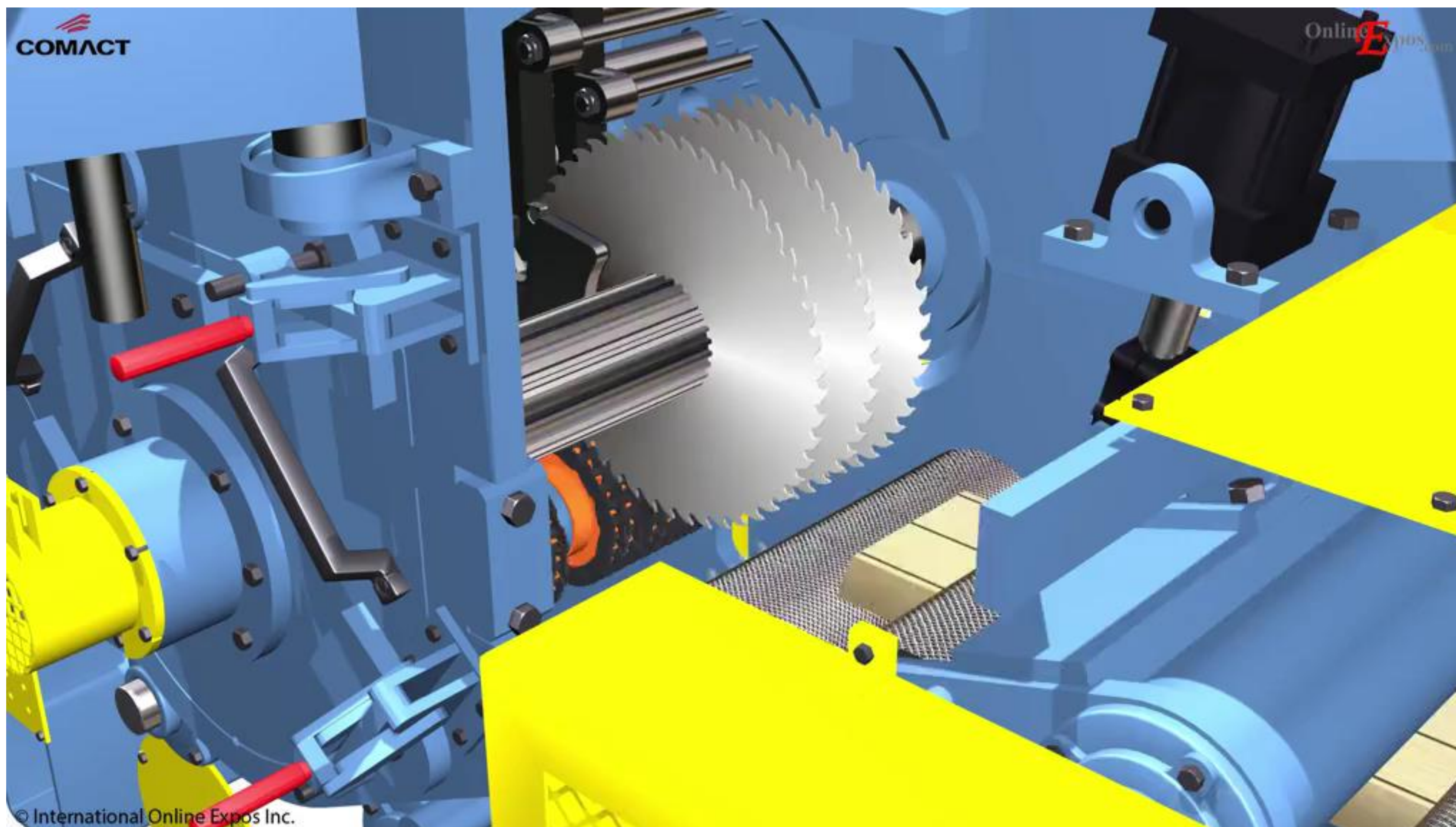
STEP 6. EDGING AND TRIMMING

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html
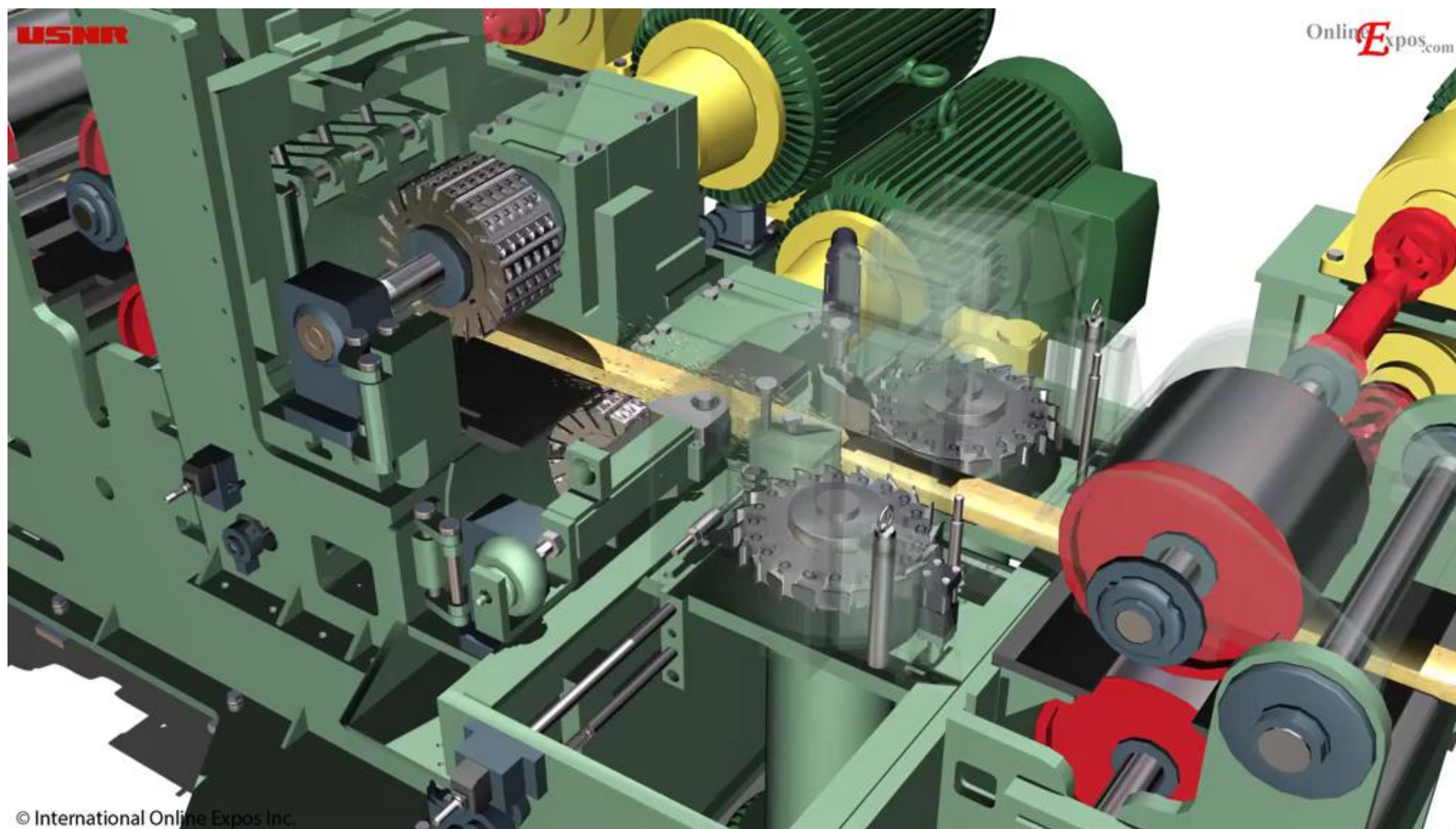
STEP 7. DRYING

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html
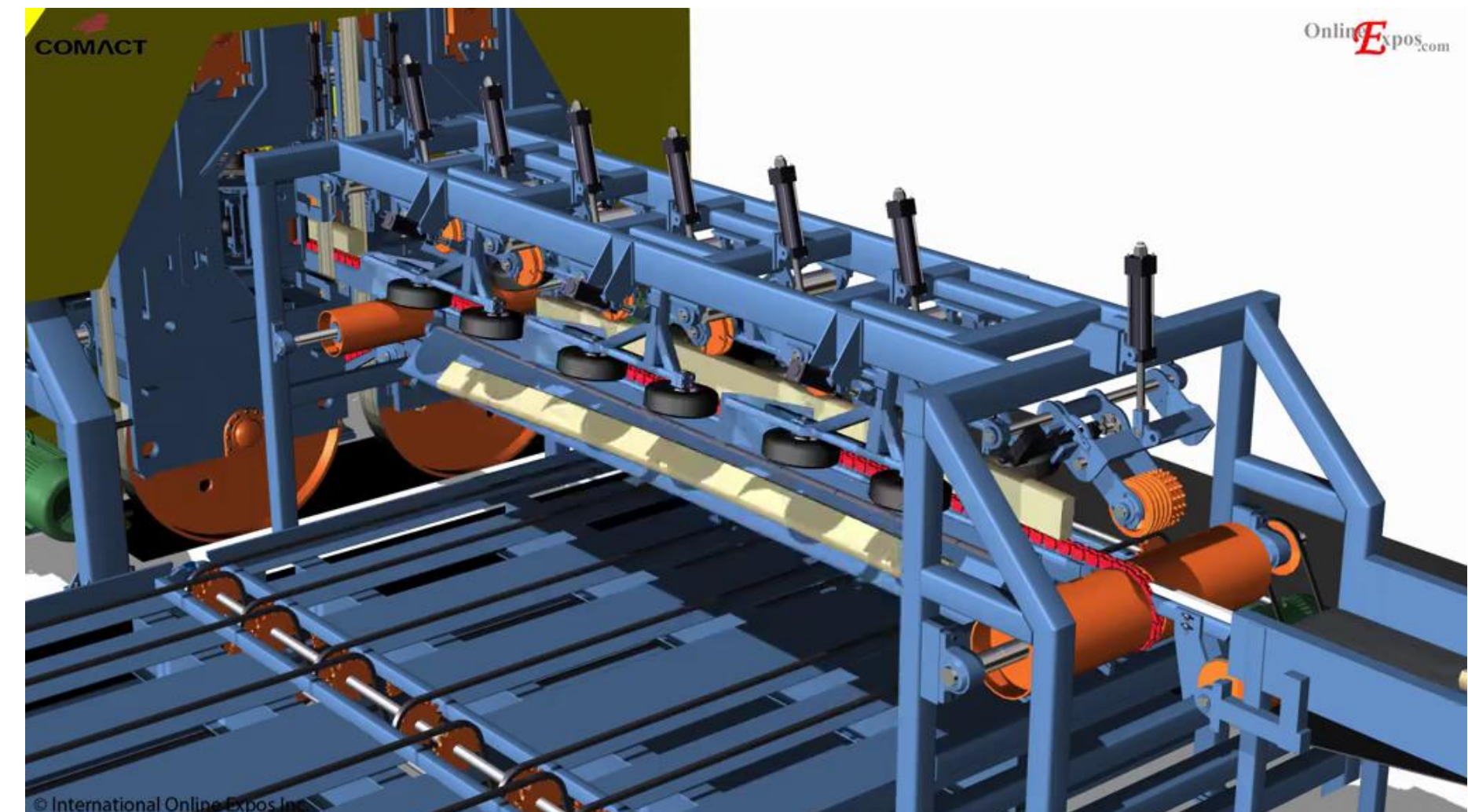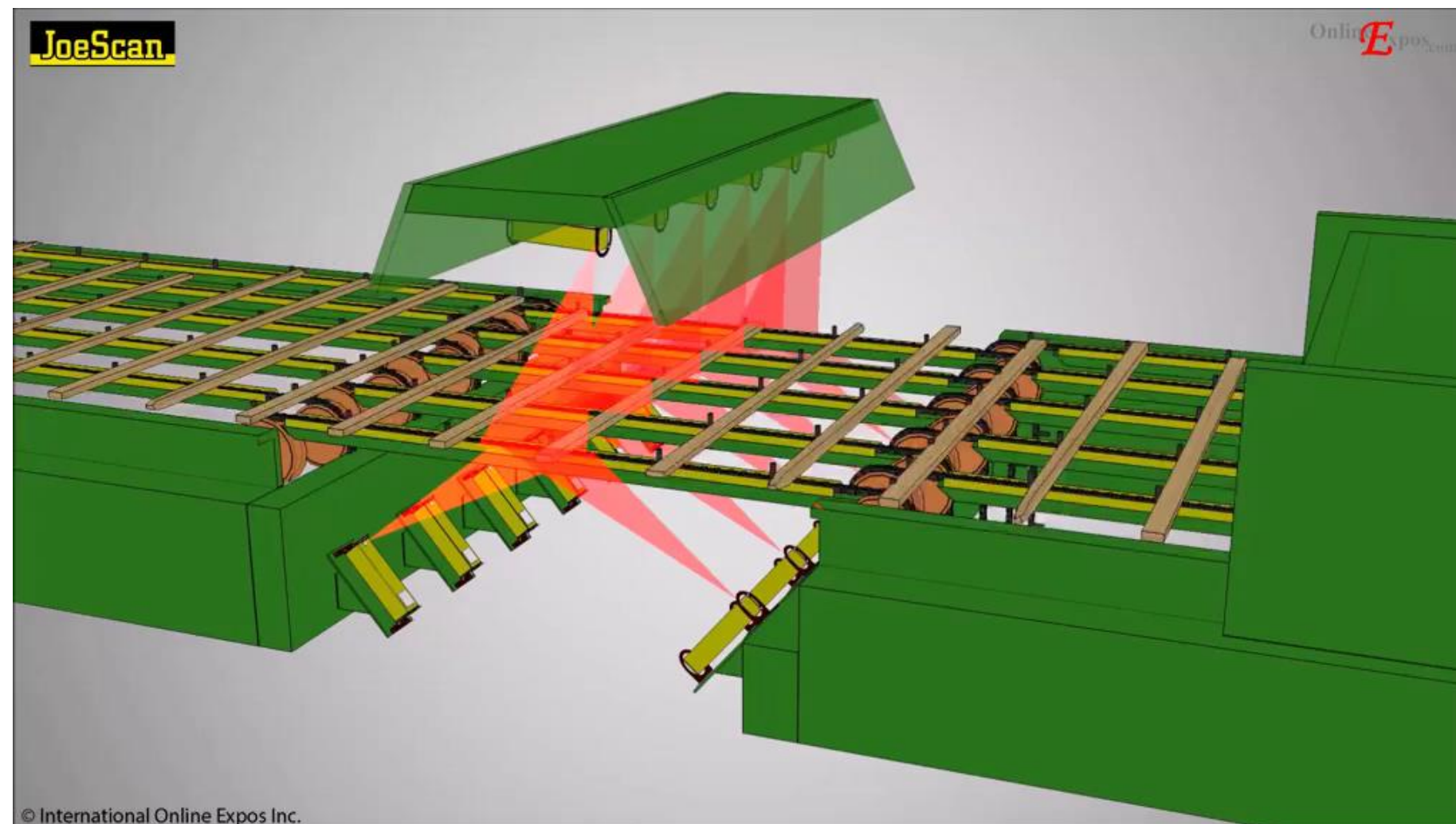
STEP 8. PLANER

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html

STEP 9. SORTING

- **Size (fast laser scanner)**

- **Species identification (Use NIR sensor and Machine Learning Technique)**

- **Strength (knots identification, using Image processing, and Convolutional Neural Network)**

Video Source: https://woodproducts.onlineexpos.com/cgi-bin/content/25/usnr_transverse_optimized_edger.html

SAWMILL

LOG TO LUMBER

SUMMARY:

Lumber Manufacturing process consists of the following steps:

1. **X-Ray Scanning** (detecting the internal features, and computing for an optimum cut)

2. **Debarking**

3. **Log Rotation Optimization** (orienting the log for maximizing the lumber volume)

4. **Canter Profiling** (cutting the log into a rectangular cant)

5. **Sawing** (cutting the cant into lumbers)

6. **Edging and Trimming**

7. **Drying** (reduce the moisture content under certain heat and pressure inside a kiln)

8. **Planing** (machine the surface of the lumber with a Planer)

9. **Sorting** (based on the size and species)

10. **Grading** (based on the applications and the quality)