OAK RIDGE NATIONAL LABORATORY

MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Ralph Dinwiddie
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, TN 37831-6064
(865) 574-7599

December 18, 2003

Thomas E. Steffner
Better Than New, LLC.
211 Healing Bluff Road
Chattanooga, TN. 37419

Dear Mr. Steffner,

I have completed testing of the sagittal saw blades that you provided. The blades were divided into two sets; "Treated" and "Untreated." Untreated blades were in the "as-received" condition from the manufacturer. The treated blades were treated by the Better Than New process. Two different tests were performed on several blades from each set. The first test involved the measurement of the saw blade temperature during cutting of swine bone. The second test looked at the temperatures of the swine bone marrow are different distances from the cutting plane. In both cases I used a high performance Infrared (IR) camera to record the temperatures.

I have prepared a Microsoft PowerPoint™ presentation of the test results. The results clearly indicate the "untreated" sagittal blades reach higher temperatures compared to the "treated" blades. Unfortunately, I determined the time duration of data acquisition based on some preliminary test cuts of both treated and untreated saw blades. However, it was discovered during testing that the 6.5 second acquisition time was insufficient to record the entire cut for many of the untreated blades. Therefore half of the untreated blades did not complete the cut in the specified time and a final (maximum) temperature could not be included on the data sheets. Thus, the average "untreated" blade temperatures are an underestimate of the true value, since the hottest "untreated" saw temperatures were not in the average. Of course, this shows that the treated saw blades not only cut the bone cooler than the untreated blades, but, also faster. When studying the depth of heat penetration into the bone marrow I found that the untreated saws resulted in a bone marrow temperature rise of 112° F approximately twice as deep as the treated saw blade. Thus, it appears that the volume of damaged marrow is significantly reduced using the saw blade treated by the Better Than New process.

Please let me know if HTML can be of any further assistance to you and your company. I will be happy to discuss further any questions you or your customers may have concerning the tests.

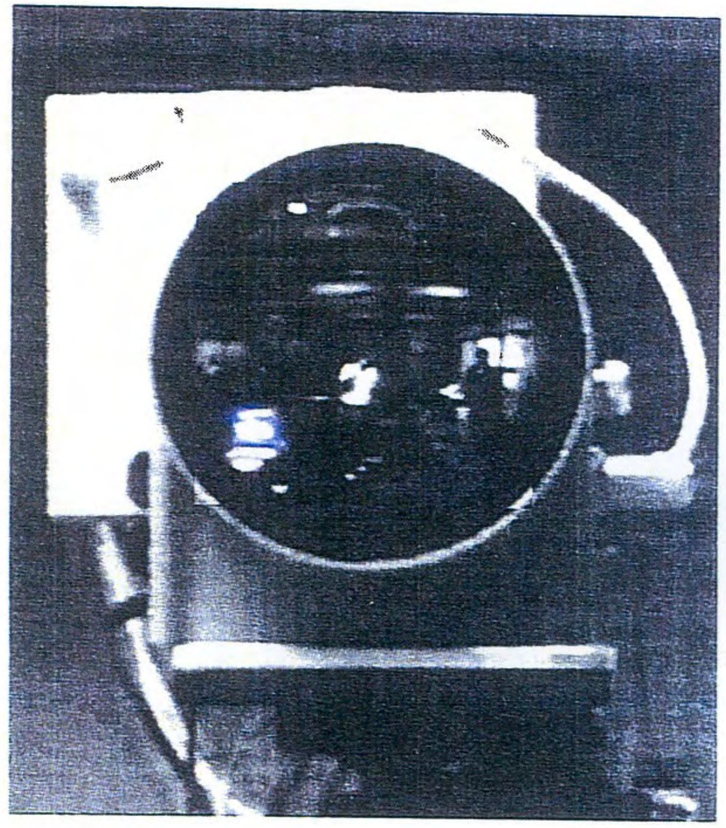
Sincerely,

Ralph B. Dinwiddie, Ph.D.
Senior Research Scientist

ORNL

The State-of-the-art Infra-red Camera Has Many Unique Features and Capabilities

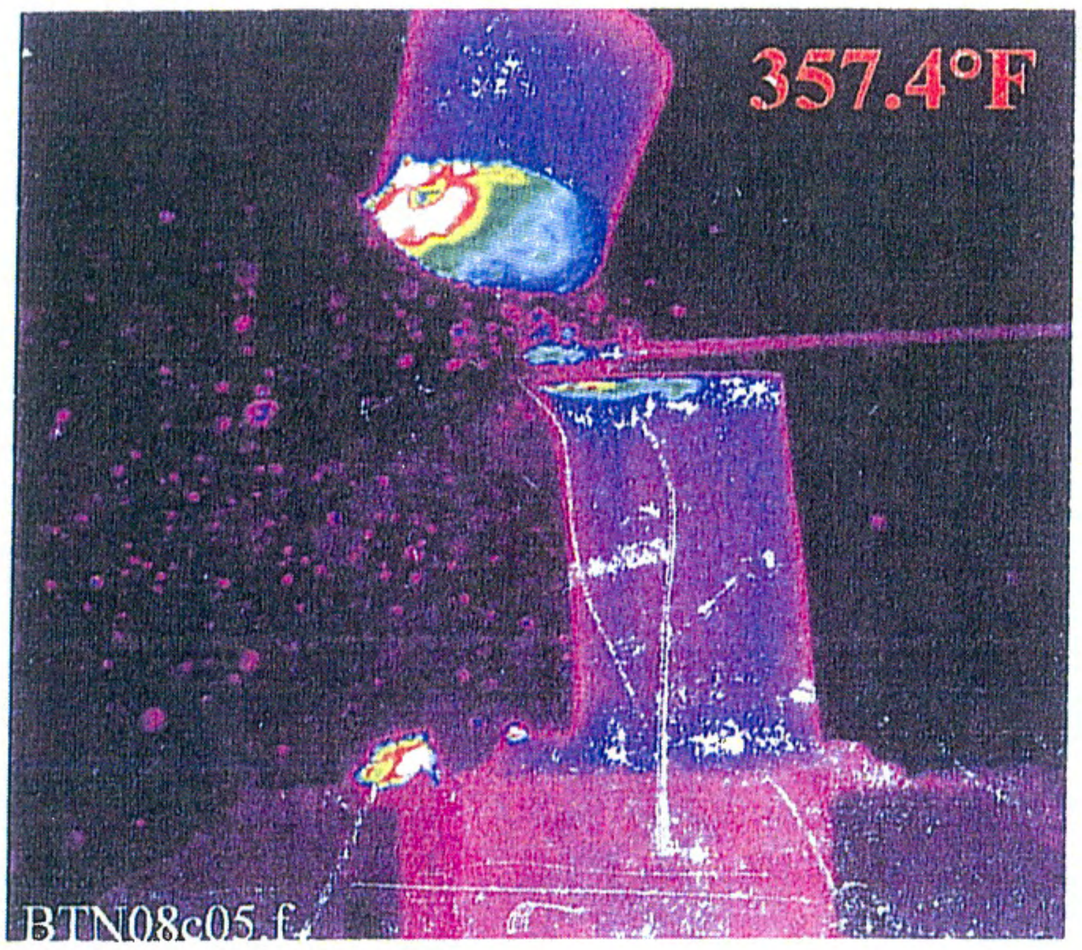
- 256 x 256 InSb Snapshot Focal Plane Array
- Up to 6100 images per second (142 images/s full field)
- Exposure time: 14 ms to 2 μs
- External Synchronization & Triggering
- DFOV (75/250 mm) lens with 5 position filter wheel
- 12 bit digital images & 8 bit video images
- Computer controlled
- Portable
- Microscope attachment
- Calibrated for temperature
- Advanced image analysis
- Active/Passive Thermography
  - Non-destructive testing
  - Process monitoring
  - Property measurements
  - Medical Applications
  - Environmental Applications



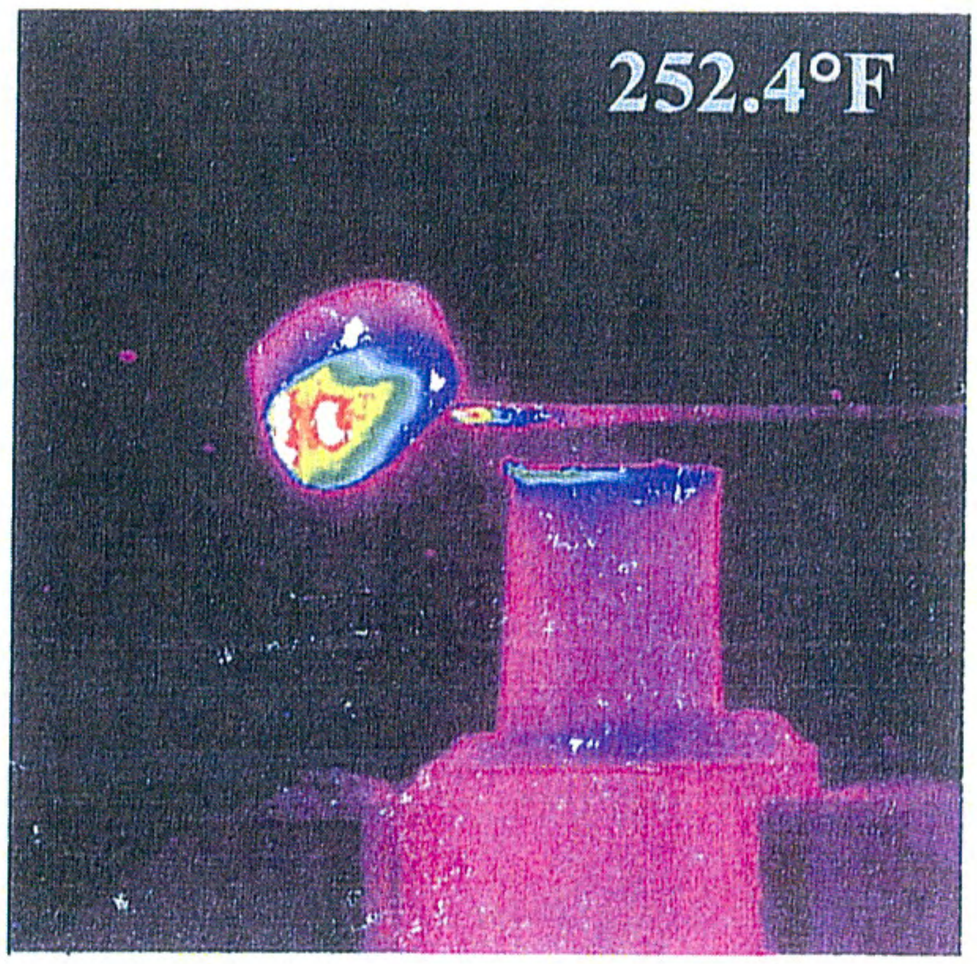
THERMAL NECROSIS STUDY

The results of a study done by the Department of Energy's laboratories concluded the technology developed by _____ will reduce friction on a stainless steel surface which in turn lowers heat and wear during the normal use of what the part was intended to do. In the example below (actual slides made during the study) the slide on the left depicts a new sagittal saw blade reaching a peak temperature of 357.4°F while sawing a swine bone with a temperature 98°F, .79" diameter in an elapsed time of 5.21 seconds. The slide on the right is the same model of blade enhanced with the new technology sawing a larger portion of .97" of bone with an elapsed time of 5.02 seconds with a peak temperature of 252.4°F.

WITHOUT TECHNOLOGY



WITH TECHNOLOGY

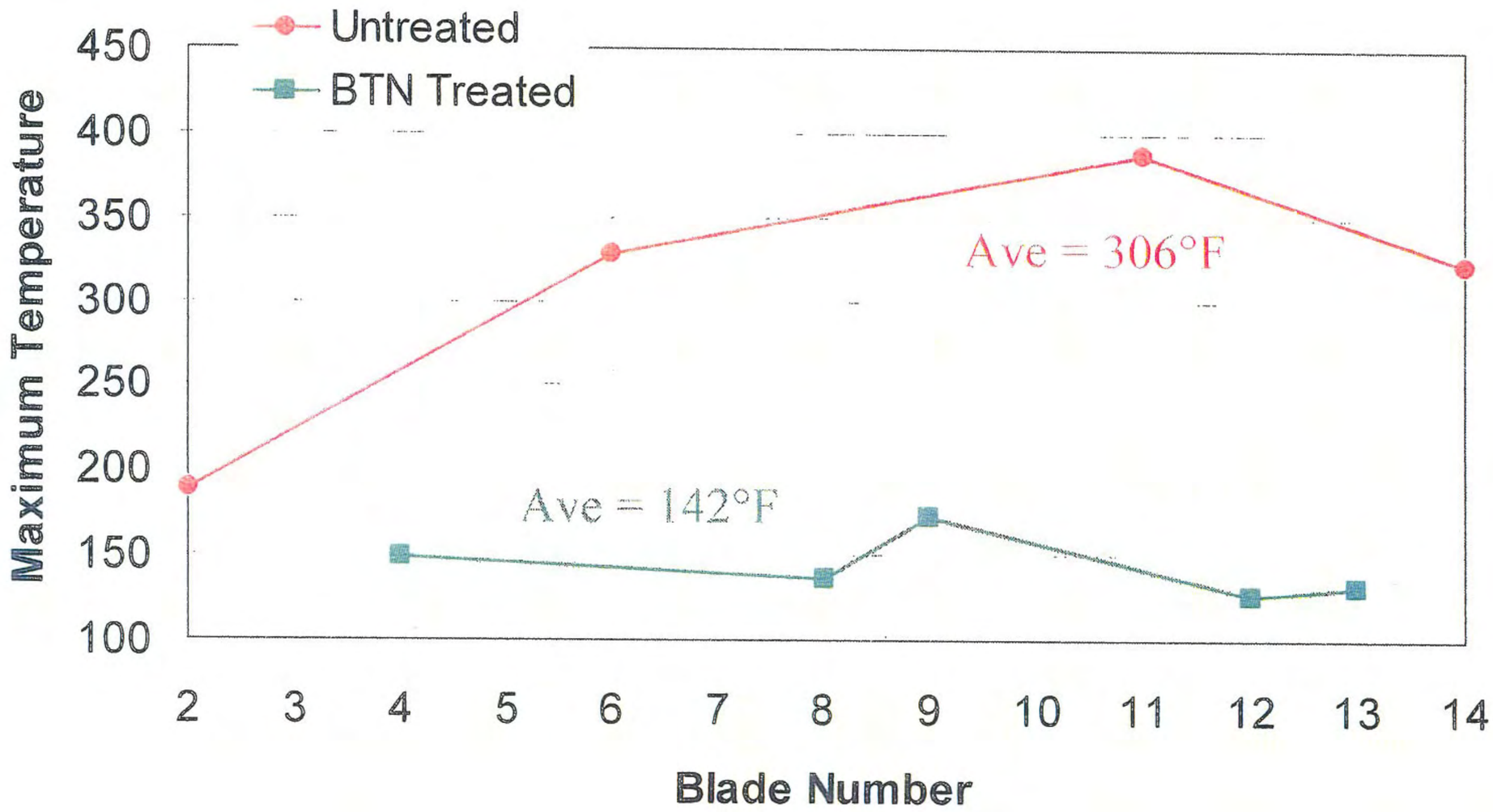


ADDITIONAL TESTS DONE BY D.O.E.:

1) Concluded the blade without the technology generated temperatures higher than 112°F averaged twice as deep in the bone.
2) NO measurable wear - after using the enhanced blade for a duration equal to four knee replacement operations this blade was compared to a new "off the shelf" blade. The standard blade under performed destroying 80% more bone cell tissue.

Double Blind Study Shows the BTN Treatment Reduces Saw Guide Block Temperatures by More Than 50%

Comparison of Treated and Untreated Saw Guides



ORNL

OAK RIDGE NATIONAL LABORATORY

MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Ralph Dinwiddie
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, TN 37831-6064
(865) 574-7599

March 30, 2004

Thomas E. Steffner
Better Than New, LLC.
211 Healing Bluff Road
Chattanooga, TN. 37419

Dear Mr. Steffner,

The sagittal saw guide block test is complete. The purpose of this test was to determine whether guide blocks treated with the "Better Than New" process would operate at cooler temperatures than untreated (as-received) guide blocks. The test compared the maximum temperature rise of one treated and one untreated guide blocks during the cutting of a poplar board. Both treated and untreated blades were used for each block tested. Specifically, 4 treated blades and one untreated blade were used with each of the guide blocks. The guides were held down by a screw and secured against a shoulder machined into the board. This arrangement insured no movement of the guide block during the cutting operation. The sagittal saw was then used to cut a 1.25" X 1.25" X 0.1875" block from the board. The saw was operated by an experience surgeon, Thornton Perkins M.D. The experiment was ~~set~~-up as a double blind test so that neither Dr Perkins nor I knew which blades were treated and which blades were untreated until all computations of temperature were completed.

I have prepared a Microsoft PowerPoint™ presentation of the test results. The results shows the BTN treatment reduces saw guide block temperatures by more than 50%. The average of the maximum temperatures of the untreated guide during the cutting operation was 307°F. The average of the maximum temperatures of the treated saw guide blocks was 143°F. Unfortunately, we lost the data from the test involving the treated blade in the untreated saw guide due to a computer operation error. There is no overlap in the data. The coolest running blade (#2) in the untreated guide (T=189°F) is hotter than the hottest blade (#9) running in the treated guide (T=172°F).

Please let me know if HTML can be of any further assistance to you and your company. I will be happy to discuss further any questions you or your customers may have concerning the tests.

Sincerely,

Ralph B. Dinwiddie, Ph.D.
Senior Research Scientist

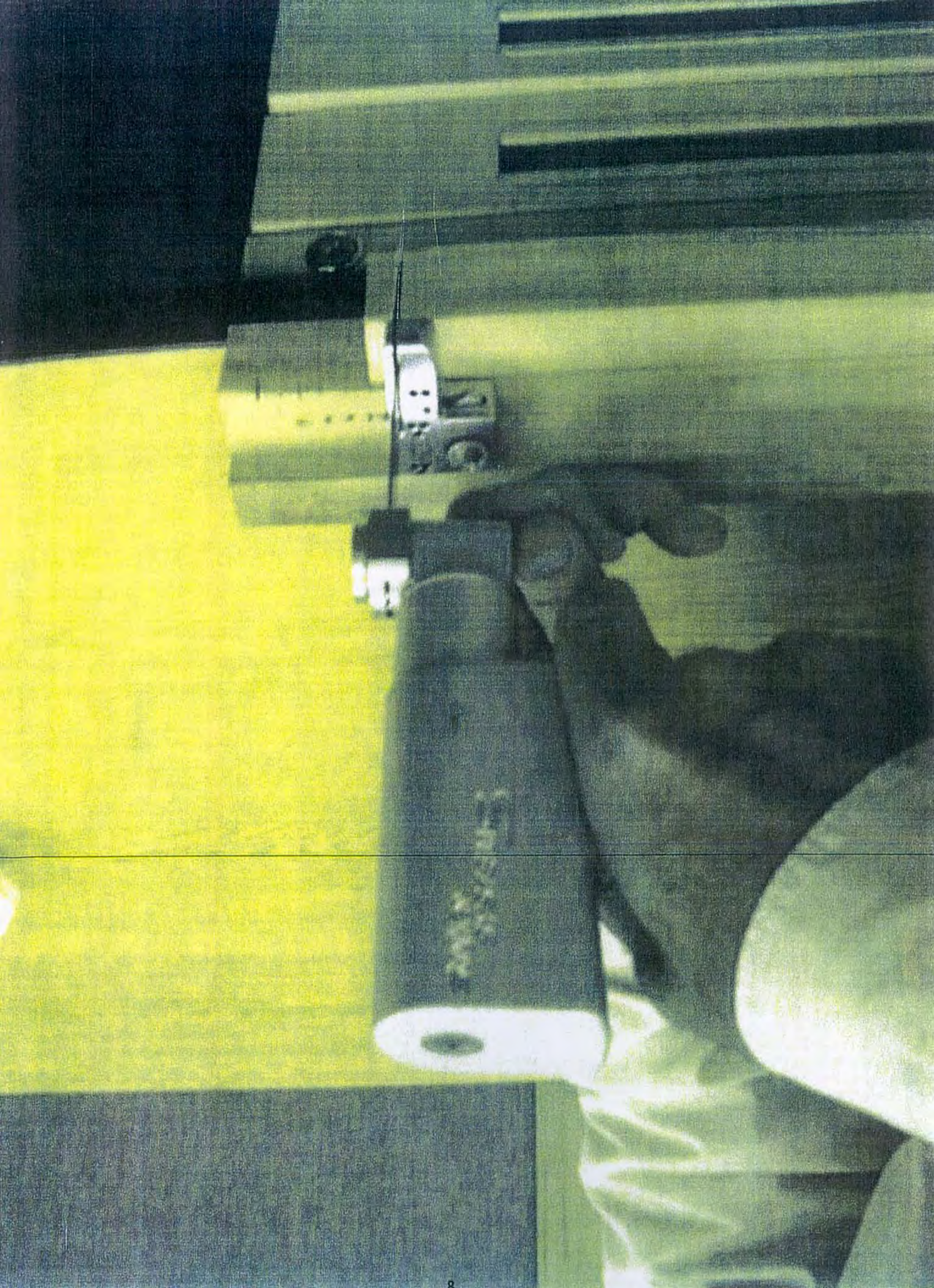
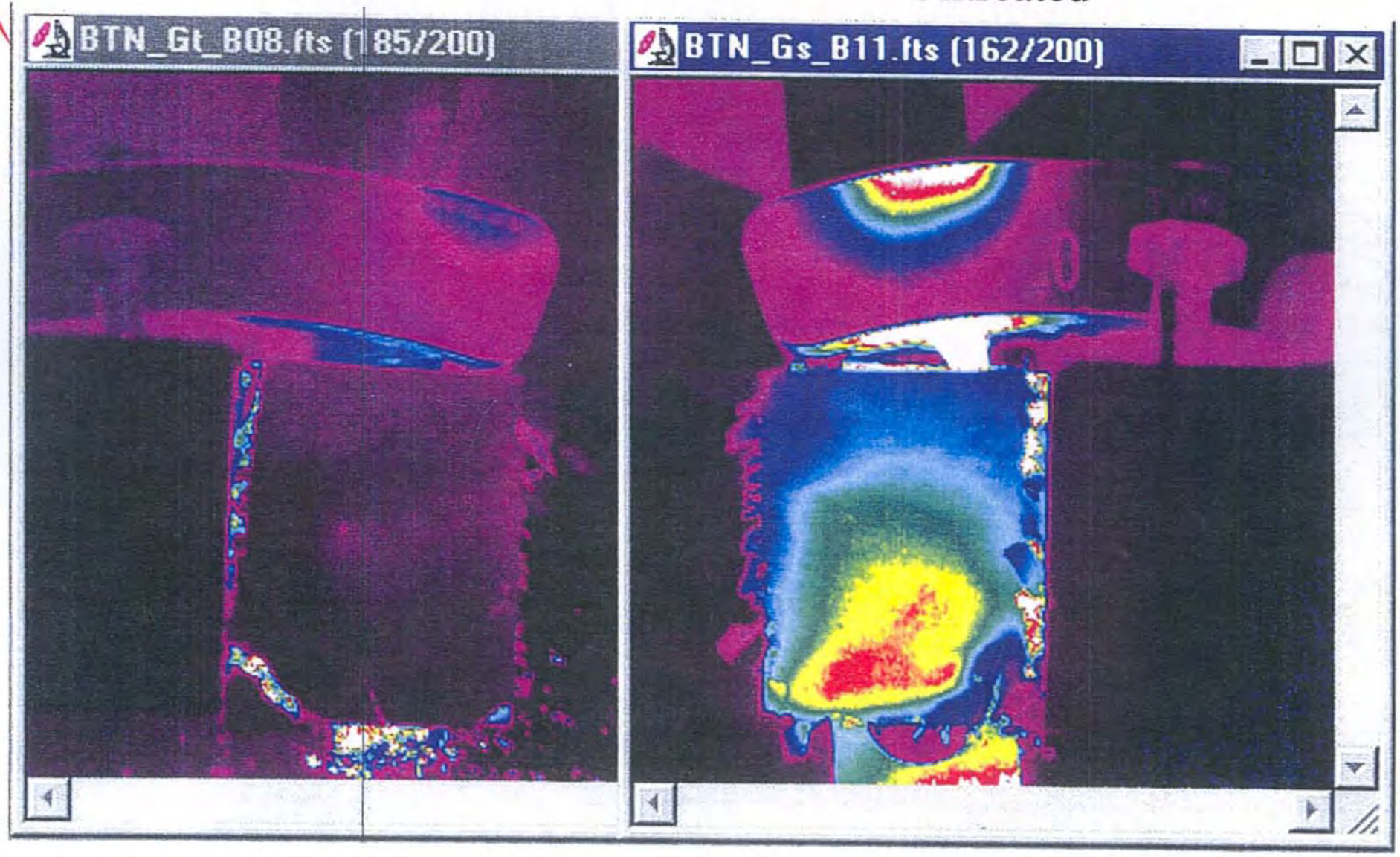


Image Taken 0.1 Seconds Before End of Cut

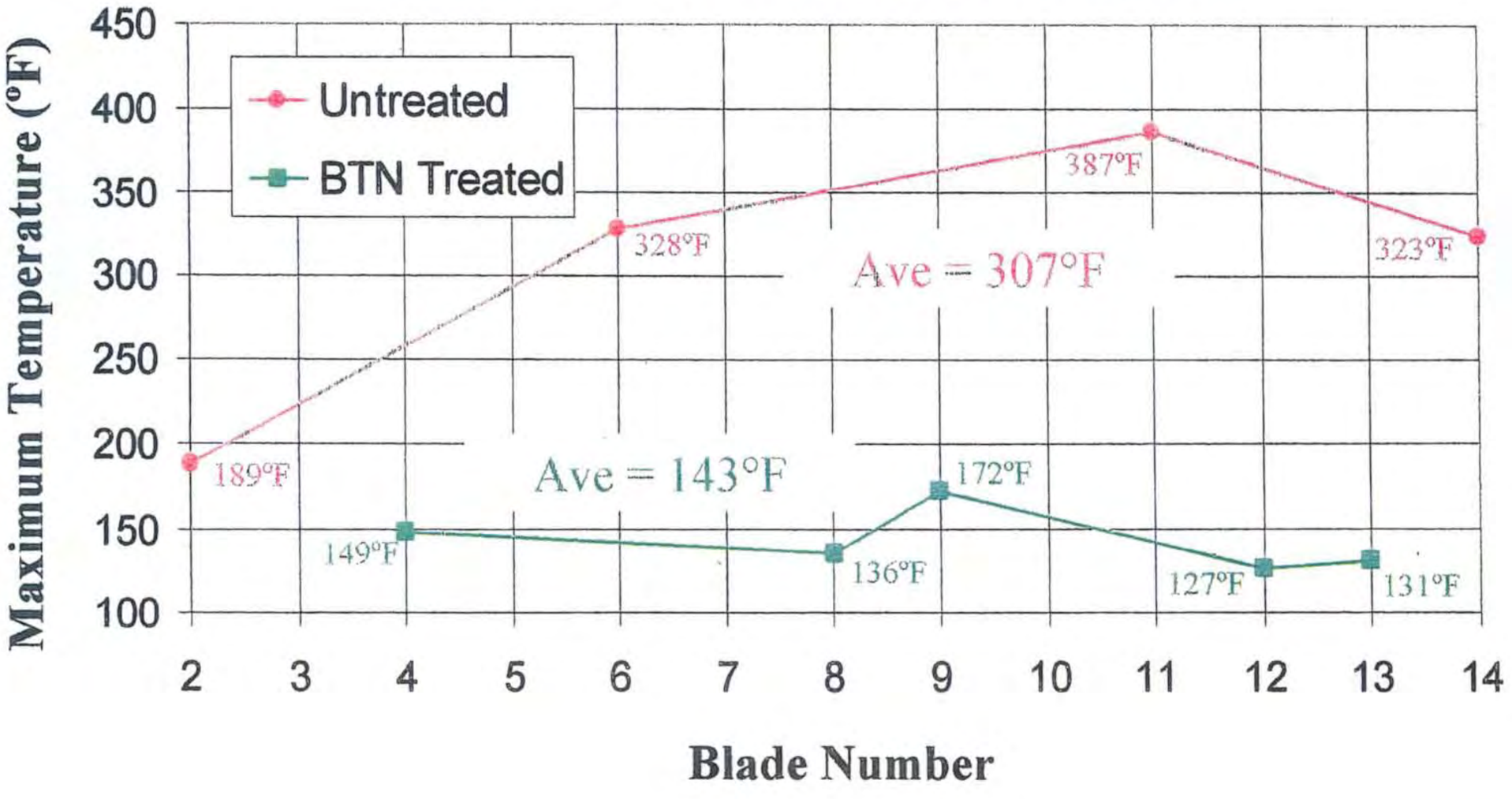
Treated

Untreated



Double Blind Study Shows the BTN Treatment Reduces Saw Guide Block Temperatures by More Than 50%

Comparison of Treated and Untreated Saw Guides During Cutting Operations



ORNL