

# DEFORM™ News

## Events:

- May 6 & 7, 2009: The Spring DEFORM User Group Meeting will be held at the Bridgewater Banquet & Conference Center in Columbus, Ohio. Details are available on the web site. Register now for this exciting event.

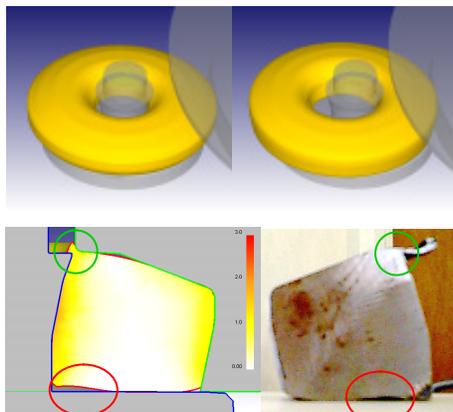
## Training:

- Advanced training will be held at the SFTC office in Columbus, Ohio on May 7 & 8, after the Spring DEFORM User Group Meeting.
- April 21 & 22, 2009: DEFORM-2D training (includes DEFORM-F2) will be conducted at SFTC in Columbus, Ohio.
- April 23 & 24, 2009: DEFORM-3D training (includes DEFORM-F3) will be conducted at the SFTC office.

## Ring Rolling

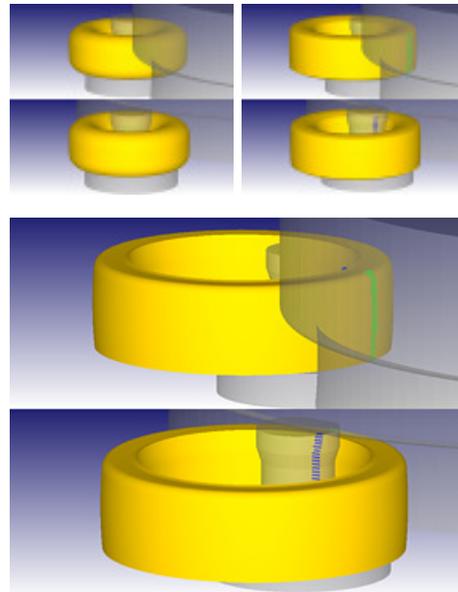
Last spring, the DEFORM News provided a summary of our ring rolling development. At that time, results were shown from two applications. During the last year, numerous applications have been run with excellent success at SFTC and customer sites. The code is maturing, and the number of applications has increased. A summary of the current status follows.

A steel gear blank with known defects was simulated. This ring was formed at 1000 degrees C, with a drive roll rotation of 120 RPM. The mandrel feed (velocity vs. time) was based on production data.



The images above depict the preform (top left) and intermediate shape (top right). The underfill (red ellipse) and premature flash formation (green circle) are shown in the simulation (bottom left) and production section (bottom right).

An 8620 steel gear blank has been produced by Jernberg Industries. DEFORM simulated this process with excellent correlation to the production data. This ring is rolled at 1800 degrees F. The drive roll rotated at 60 RPM, with a mandrel feed of 0.4" per second. The workpiece revolved twenty seven revolutions.



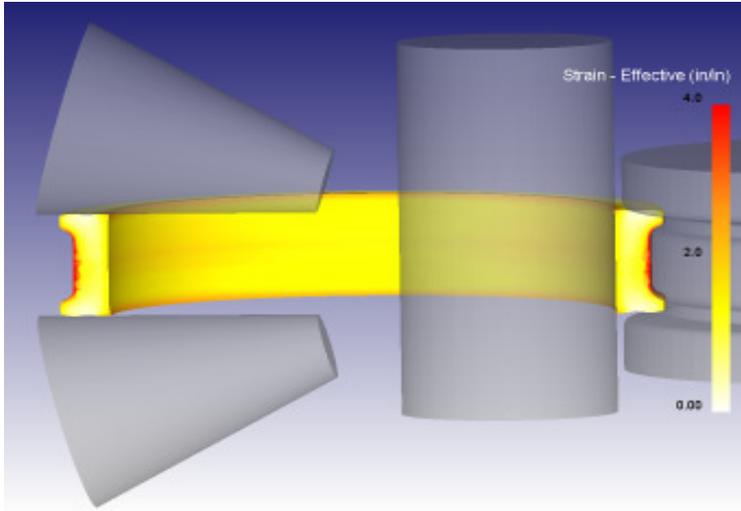
These image pairs depict drive roll contact (green dots) and mandrel contact (blue dots).



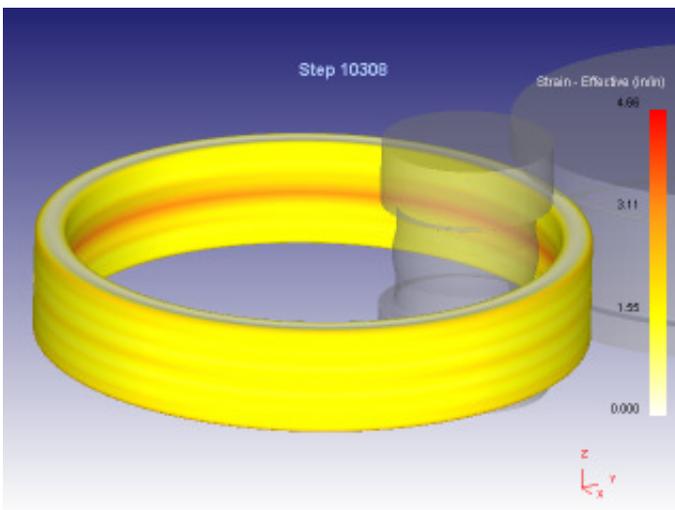
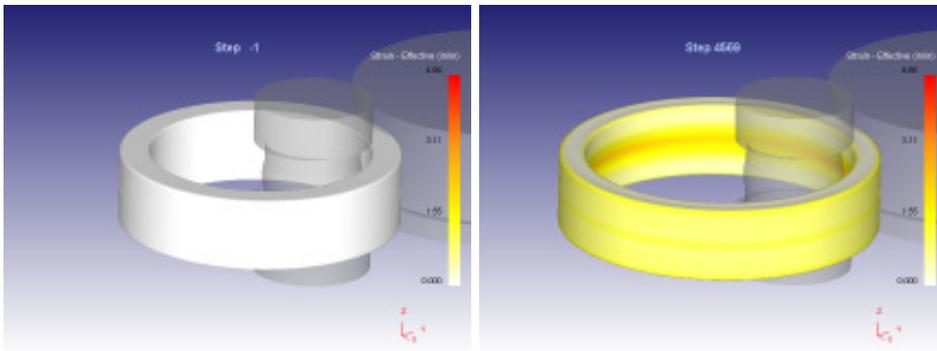
Note the lip on the top of the I.D.

(over)

(continued)



A steel section with flanges on both faces is shown. Contours of strain (red is higher) is shown near the end of the process. The axial rolls were used to maintain end flatness on the flanges, which were otherwise subject to underfill. To resolve the geometry, a large model was used with over 40,000 brick elements. MPI was used to reduce simulation times.



This cold rolled bearing shows the progression of effective strain (red is higher). This simulation ran in a few hours on a laptop computer.

Feel free to contact SFTC to discuss your ring rolling applications.

## Releases:

DEFORM-3D V6.1.3 and DEFORM-F3 V6.1.3 were released in May. DEFORM-2D V9.1.1 was released in March. These service packs are primarily bug fixes and code refinements.

A major release is in the final development stages at this time. Version 10.0 is the first combined release for both 2D and 3D systems. This release will include 2D - 3D integration, a new license manager, multiple material groups and developments in shape rolling and ring rolling. Additionally, compiler and operating system studies are being performed to improve system performance.

More details on the V10.0 release will be presented at the Spring DEFORM User Group Meeting. For specific details, please contact SFTC.