One-step Unforming and Formability Analysis

One-step: a FEM-based sheet metal unforming, flattening, and formability analysis solution

fact sheet

Siemens PLM Software

▶ Summary

NX® Progressive Die Design software includes One-step Unforming and Formability Analysis, a state-of-the-art FEM (finite element method) based unforming, flattening and analysis solution for tool and die makers. By combining industry knowledge, best practices and automation, One-step enables the rapid creation of flattened blanks and pre-forms from complicated freeform sheet metal part geometry. NX Progressive Die Design with One-step excels at unforming and flattening the most complex and challenging sheet metal components; One-step Formability Analysis helps tool and die makers save time by effectively validating designs for thinning, stress/strain and springback.

Benefits

Easily create accurate blank shapes

Automate the process for blank creation making it faster and more accurate

Reduce and eliminate physical die try-outs

Minimize costs by improving material usage

Reduce die design errors

Streamline blank, scrap and strip design

Business challenges

Generating accurate representations of the flat blank for complex shapes

Allowing for material deformation in design patterns

Job turnaround and project time

Cost control

Software investment and solution cost

Eliminate data translation and data transfer to 3rd party applications

Process efficiency

Waste and human error

Tool quality

The One-step Unforming and Formability Analysis command helps save costs by reducing physical try-outs. It offers a streamlined workflow based on industry best practices:

Easily work with freeform sheet metal part geometry. One-step effectively works with both NX and translated geometry. Part files do not require features and include solid and surface geometry.

Define material type. One-step supports an extensive set of material types provided within NX Progressive Die Design. Definition of the material properties affects the unformed shape solution.

Control boundary conditions and tip direction. Boundary conditions are applied to control how geometry is unformed. The entire part may be flattened or portions of a part unformed.

Finite element mesh generation and finite element analysis. One-step automates meshing with the creation of high quality meshes based on best practices and eliminates the need to manually mesh the part. A fast and accurate state-of-the-art solver calculates the blank profile using industry proven formulas.
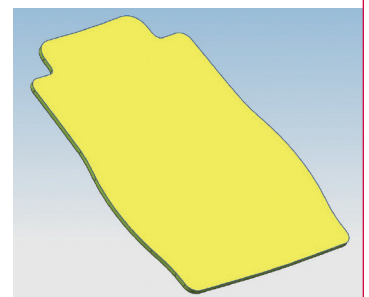
Blank profile/outline generation and blank modeling. The blank and pre-form outlines are output from One-step and used to quickly model the flattened blank and intermediate form.
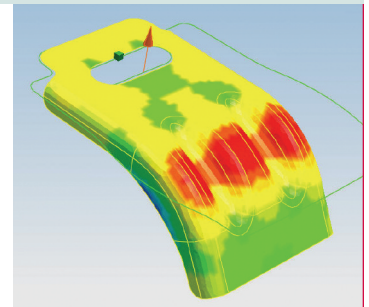
Finite element mesh
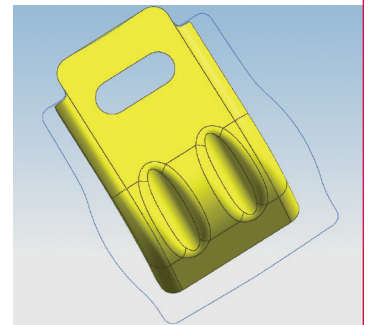
Blank profile

Sheet metal blank

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Blank layout and strip layout design. Leverage the full power of NX Progressive Die Design to fulfill downstream design requirements for blank nesting and strip layout design.

Powerful and flexible. Use predefined standard materials, or configure new material properties. Leverage advanced controls to specify mesh and element type. Automated report generation captures and documents analysis results.

> **"One-step Unforming, a fast and accurate freeform sheet metal unforming solution, can help to reduce and even eliminate effort/time on costly physical try-outs. Additionally, since One-step Unforming is included within NX Progressive Die Design, we can ultimately save on our overall software investment by no longer having to rely on 3rd party flattening applications."**
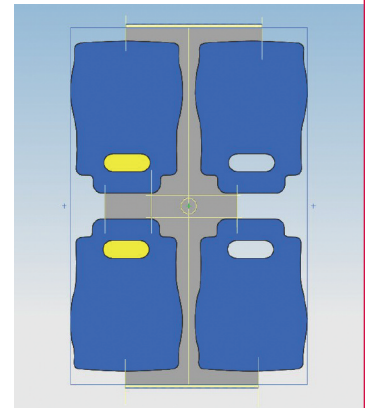>
> *Rainer Lahme, Software-Consultant CAx, EDM, Chief Information Office, Wincor Nixdorf*

One-step Unforming is available within the NX Progressive Die Design module.
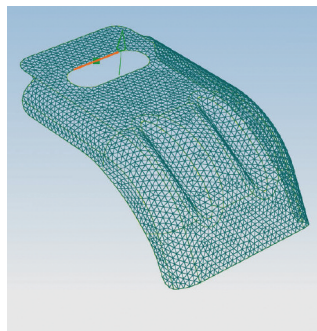
One-step Unforming and Formability Analysis are available within the Mach 3 Progressive Die Design product.
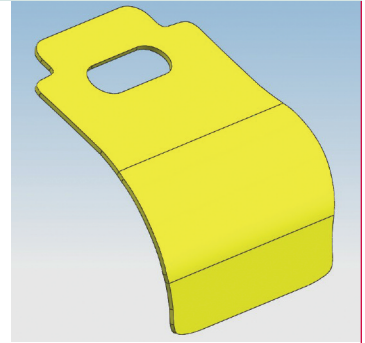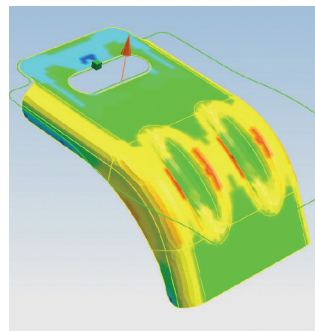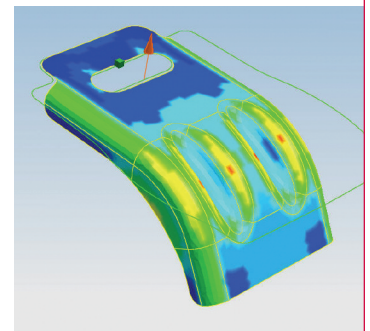

Pre-form

Blank layout/nest/scrap

Automated meshing

Stress results

Strain results

► **Contact**
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