Simulating Sheet Metal Forming in Fusion 360 Event Simulation

Ebot Ndip-Agbor

Research Engineer

Lee Taylor

Distinguished Research Engineer

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About the speaker

Ebot Ndip-Agbor

Ebot Ndip-Agbor is a Research Engineer at Autodesk and a member of the Fusion 360 Family simulation team. He has a PhD in Manufacturing and Mechanics from Northwestern University. During his doctoral work, Ebot focused on a wide range topics including: finite element simulation and process parameter optimization in sheet metal forming and GPU-based finite element acceleration in additive manufacturing. At Autodesk, Ebot works primary on Generative Design and development of Fusion 360 Event Simulation.

About the speaker

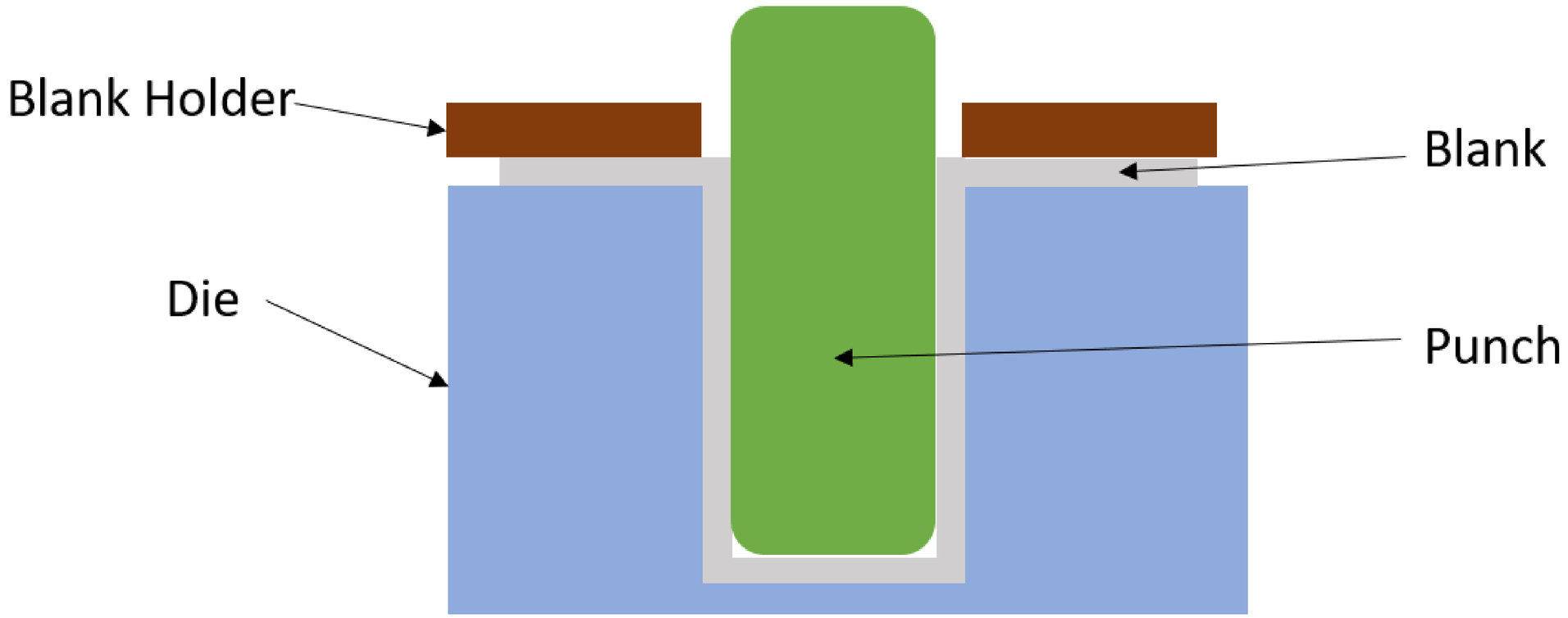
Lee Taylor

Lee Taylor is a Distinguished Research Engineer at Autodesk and a member of the MCP organization. He has a PhD in Engineering Mechanics from the University of Texas at Austin and 35 years of experience developing high performance finite element applications. Lee was a researcher for ten years at Sandia National Laboratories and left there to work in the commercial software industry where he developed high-performance, parallel explicit dynamics applications that are widely used. Lee is the author of Autodesk’s explicit dynamics software that powers Fusion Event Simulation.

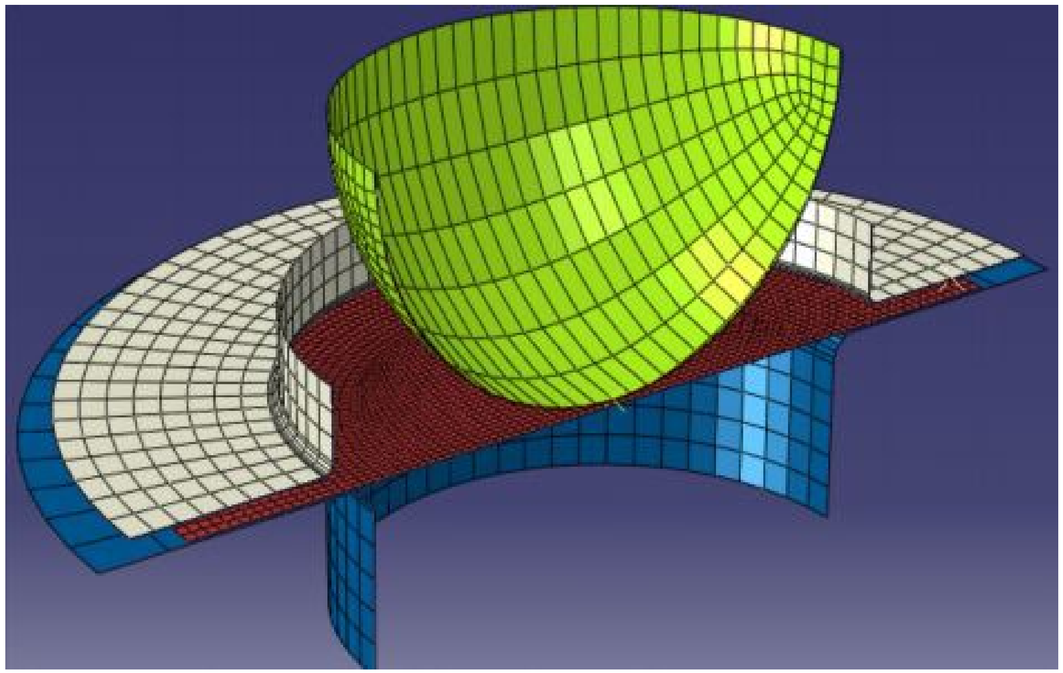
Learning Objectives

- Setup dynamic simulations for non-linear problems with contact.
- Define boundary conditions and loads for sheet metal forming problems.
- Setup non-linear materials and contacts for forming problems.
- Correctly interpret results (stresses, strains, and reaction forces) from a sheet metal forming simulation.

Deep Drawing



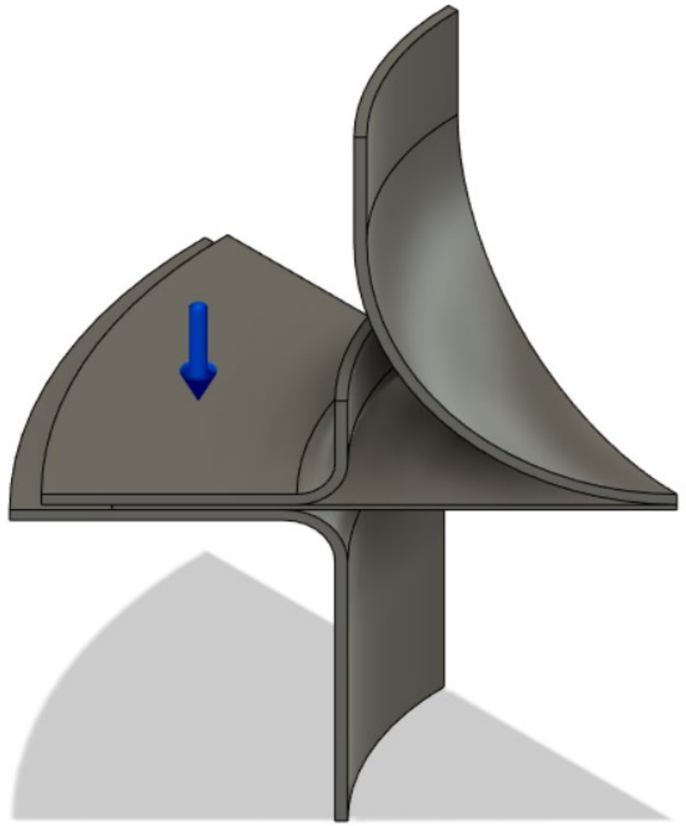
Deep Drawing - Simulation



Material	AL5754-O
Blank Diameter (mm)	177.8
Thickness (mm)	1
Poisson ratio, μ	0.33
Young's modulus, E (GPa)	70
Density (g/cm^3)	2.7
Yield Stress (MPa)	250
Ultimate Tensile Stress, (MPa)	290
Punch travel, (mm)	57
Punch Diameter, (mm)	101.6
Inner Diameter of Blank Holder, (mm)	103.6
Outer Diameter of Blank Holder, (mm)	200
Inner Diameter of Draw binder, (mm)	103.6
Outer Diameter of Die, (mm)	210
Coefficient of Friction	0.05

S.Jamshidifard, H. Ziaeipoor, H. Moosavi, H. Khademizadeh. "Investigation of hydrostatic counter pressure effect on thickness distribution in Hydromechanical deep drawing process with hemispherical punch". Proceedings of the 2nd International Conference on Manufacturing Engineering, Quality and Production Systems

Deep Drawing Models



Live Demo

Turn to page 7 of the handout and follow.

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