EWI Forming Center: Material Formability Testing

EWI's Forming Center offers material formability testing of various types of sheet material including steel, aluminum, titanium and nickel alloys. These tests include cup draw testing, biaxial bulge testing, and FLD testing. EWI engineers evaluate the results of these tests (and others) to provide recommendations on lubricants, coatings, and materials for your specific application.

Deep Draw Testing - Erichsen

Name	Reference	Description	Rate*
B2 Erichsen Deep Draw Test	ISO 11531	Evaluation of the material drawability and/or earing tendency using a 50-mm drawing punch. Ten square blanks (5-in) are required for testing (five for set-up, five for testing). Material thickness range of 0.2 - 6mm	$2,360
B2 Erichsen Deep Draw Test - Additional Materials	ISO 11531	Additional Deep Draw Test with the pre-defined testing conditions	$1,485
B2 Erichsen Deep Draw Test - Elevated Temp	ISO 11531	Deep Draw Test at Elevated Temperature (up to 550 C, 1022 F)	$3,345
B2 Erichsen Deep Draw Test - Elevated Temp, Additional Materials	ISO 11531	Additional Deep Draw Test at Elevated Temperature with the pre-defined testing conditions	$2,032

Cup Draw Testing

Name	Reference	Description	Rate*
Cup Draw Test		Evaluation of the material drawability and/or preformance of stamping lubricants using a 6-in diameter punch. Nine (9) 12-in diameter blanks are required for each lubricant or material. Maximum sheet thickness is 2.54-mm (0.1-in). Maximum tensile strength is 1200-Mpa with a maximum gage of 1.2-mm (0.048-in)	$5,455
Cup Draw Testing, Additional Materials		Additional Cup Draw Test with the pre-defined testing conditions.	$2,331
Cup Draw Testing at Elevated Temperatures		Cup Draw Test at Elevated Temperature (up to 750 F)	$8,182
Cup Draw Testing at Elevated Temperatures, Additional Materials		Additional Cup Draw Test at Elevated Temperature using the pre-defined testing conditions	$3,496
Cup Draw Test w/ Strain Measurement		Cup Draw Test with 3D strain measurement data obtained using an ARGUS strain anaylsis system.	$7,405
Cup Draw Test w/ Strain Measurement - Additional Materials		Additional Cup Draw Test with the pre-defined testing conditions and ARGUS data.	$3,553
Cup Draw Test w/ Strain Measurement, Elevated Temperatures		Cup Draw Test at Elevated Temperature (up to 750°F) and 3D strain measurement data obtained using an ARGUS strain anaylsis system	$11,575
Cup Draw Test w/ Strain Measurement, Elevated Temperatures - Additional Materials		Additional Cup Draw Test at Elevated Temperatures with the pre-defined testing conditions and ARGUS data	$5,343

*Rates subject to change.

For additional information or a quote please contact Laura Zoller, Project Engineer at lzoller@ewi.org or Brad Nagy at bnagy@ewi.org. 614.688.5000 / 1250 Arthur E. Adams Drive, Columbus, OH 43221 EWI.org/technologies/labservices

EWI Forming Center: Material Formability Testing, continued

Biaxial Bulge Testing

Name	Reference	Description	Rate*
Viscous Pressure Bulge (VPB) Test*		Equi-biaxial tension test to obtain a stress-strain curve of the sheet material. Five (5) 10-in square blanks are required for this test. Maximum sheet thickness for this testing is 2.54-mm (0.1-in). Maximum tensile strength for this testing is 1200-MPa (170-ksi) with a maximum gage of 1.2-mm (0.048-in).	$3,702
Viscous Pressure Bulge Test - Additional Materials		Additional VPB Testing with the pre-defined testing conditions.	$1,933
Erichsen Hydraulic Bulge Test with Digitial Image Correlation (DIC)		Equi-biaxial tension test to obtain a stress-strain curve of the sheet material using a 4-in drawing punch with DIC. Ten (10) 10-in square blanks are required for testing (5 for setup, 5 for testing).	$4,183
Erichsen Hydraulic Bulge Test with DIC - Additional Materials		Additional Erichsen Hydraulic Bulge Test with pre-defined testing conditions	$2,432

Forming Limit Diagram (FLD) - Erichsen

Name	Reference	Description	Rate*
FLD 5-point Test	ISO 12004	Nakajima or Marciniak (4-in drawing punch) test to obtain a full scale 5-point FLD with DIC. Twenty (20) 10-in square blanks are required for test. Material thickness range of 0.2 - 2mm	$5,364
FLD 5-point Test - Additional Materials	ISO 12004	Additional FLD Test with pre-defined testing conditions.	$4,270
FLD 5-point Test - Elevated Temperatures	ISO 12004	5-point FLD Test at Elevated Temperature (up to 1022°F) with DIC	$7,187
FLD Test at Elevated Temperatures, Additional Materials	ISO 12004	Additional 5-point FLD Testing at Elevated Temperature (up to 1022°F) with DIC using the pre-defined testing conditions	$5,802

Limiting Dome Height (LDH) Test - Erichsen

Name	Reference	Description	Rate*
LDH Test (Full Specimen)		Evaluation of the material stretch forming ability (4-in drawing punch) using DIC. Ten (10) 10-in square blanks are required for testing (5 for setup, 5 for testing). Material thickness range of 0.2 - 2mm	$2,980
LDH Test (Full Specimen) - Additional Materials		Additional LDH Testing with DIC using the pre-defined testing conditions	$1,885
LDH Test (Full Specimen) - Elevated Temp		LDH Testing at Elevated Temperature (up to 1022°F) with DIC	$4,183
LDH Test (Full Specimen) - Elevated Temp, Additional Material		Additional LDH at Elevated Temperature (up to 1022°F) with DIC using the pre-defined testing conditions	$2,432
LDH Test (Half Specimen)		Evaluation of the edge cracking failures (4-in drawing punch) using DIC. Ten (10) 5-in by 10-in blanks are required for testing (5 for setup, 5 for testing).	$2,930
LDH Test (Half Specimen) - Additional Materials		Additional half-specimen LDH testing with DIC using the pre-defined testing conditions	$1,835
LDH Test (Half Specimen) - Elevated Temp		Half specimen LDH Testing at Elevated Temperature (up to 1022°F) with DIC	$4,133
LDH Test (Half Specimen) - Elevated Temp, Additional Materials		Additional half specimen LDH at Elevated Temperature (up to 1022°F) with DIC using the pre-defined testing conditions	$2,382

*Rates subject to change.

For additional information or a quote please contact Laura Zoller, Project Engineer at lzoller@ewi.org or Brad Nagy at bnagy@ewi.org. 614.688.5000 / 1250 Arthur E. Adams Drive, Columbus, OH 43221 EWI.org/technologies/labservices

EWI Forming Center: Material Formability Testing, continued

Hole Expansion Testing

Name	Reference	Description	Rate*
HET	ISO 16630	Evaluation of a pre-cut hole failure during forming with a conical drawing punch with DIC. Ten (10) 5-in square blanks are required for testing (5 for setup, 5 for testing). Material thickness range of 0.2 - 2mm	$2,930
Hole Expansion Testing (HET), Additional Materials	ISO 16630	Additional HET Testing with DIC using the pre-defined testing conditions	$1,585

Other Forming Center Resources

Name	Reference	Description	Rate*
Servo Press Die Try-Out (Full Day)		Die Try Out using EWI's 3000 kN AIDA Servo Press with 250 kN blankholder force. EWI provided die or customer die. Contact EWI for press specifications.	$4,500
Hydraulic Press Die Try-Out (Full Day)		Die Try Out using EWI's 160 ton kN Minster Hydraulic Press with 100 ton blankholder force. EWI provided die or customer die. Contact EWI for press specifications.	$3,500
Hydraulic Press Die Try-Out with Warm Forming Cell (Full Day)		Die Try Out using EWI's 160 ton kN Minster Hydraulic Press with 100 ton blankholder force with Warm Forming Cell (up to 1832°F). EWI provided die or customer die. Contact EWI for press specifications.	$4,500
ARGUS Strain Analysis EWI Part		ARGUS strain analysis of one part stamped at EWI's stamping press. Outputs are final forming strains and thickness of formed part.	$889
ARGUS Strain Analysis Customer Part		ARGUS strain analysis of one industry sized part stamped at customer's facility. Outputs are final forming strains and thickness of formed part.	$1,779
ATOS Blue Light Scanner EWI Part		ATOS Blue Light scan data of one part stamped at EWI's stamping press. Outputs dimensional accuracy checks using CAD data.	$1,112
ATOS Blue Light Scanner Customer Part		ATOS Blue Light scan data of one industry sized part stamped at customer's facility. Outputs dimensional accuracy checks using CAD data.	$1,557

*Rates subject to change.

For additional information or a quote please contact Laura Zoller, Project Engineer at lzoller@ewi.org or Brad Nagy at bnagy@ewi.org. 614.688.5000 / 1250 Arthur E. Adams Drive, Columbus, OH 43221 EWI.org/technologies/labservices