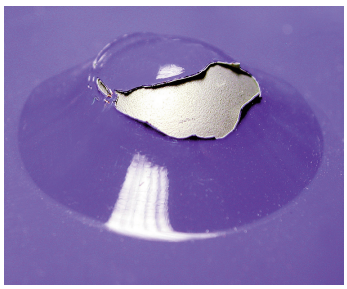
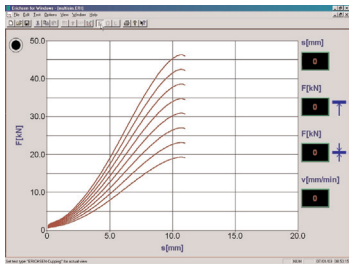


ERICHSEN Cupping Test

Deep-drawing Cup Test

Cupping and Deep-Drawing Cup Test Machine, Model 212

Square Cup Test



Data Recording

testing equipment for quality management

ERICHSEN
since 1910

ERICHSEN Cupping Test

Deep-drawing Cup Test

Electro-hydraulic Drive
Programmable Logic Control
Fully Automatic Test Sequence
Data Evaluation System

Product

Fully automatic cupping and deep-drawing cup test machine for testing the ductility of coated, ferrous and non-ferrous metals (e. g. stamping paints, lacquered, plastic coated or electroplated materials). The testing machine is provided with an electro-hydraulic drive, a maximum drawing force of 100 kN as well as digital displays indicating the drawing force, the blank holding force and the drawing punch displacement.

Application

When manufacturing deep-drawn products the ingoing material is deformed in all three co-ordinating planes. Thereby the surface coating should not become defect to avoid subsequent corrosion. For the standard controls and proofs required for the purposes of quality assurance **Model 212** is particularly suitable to conduct cupping and deep-drawing cup tests within the sheet metal thickness range of 0.1 mm to 3.0 mm.
To intensify the tests by further special investigations, it is possible to carry out without any problem a redraw (a second deep-drawing operation conducted on the standard cup using a smaller drawing die and drawing punch).
Furthermore the Bead Test Instrument, **Model 227**, can be used to form a bead into the cylindrical wall of a standard cup until a mechanic destruction of the coating is achieved. This is another possibility to intensify the test. The above-mentioned sheet thickness range of 0.1 mm to 3.0 mm is based on material with a tensile strength of 400 N/mm². In case of a higher/lower tensile strength the values mentioned concerning the maximum sheet thickness that can be drawn, are to be reduced/increased.

Purpose

The following reasons are important for using the Cupping and Deep-drawing Cup Test Machine, **Model 212**, for quality assurance, research and development:

- Lowering of the reject rate by concerted monitoring of the coating quality during production or in the process department.
- Immediate sorting out of lower quality arriving at the goods inwards department by means of the ERICHSEN cupping test or the deep-drawing cup test. Without special test preparations it is possible to establish, if the material supplied corresponds to the prescribed properties.
- The sturdy construction and hydraulic operation ensure a wear-resistant functioning of the machine so that high accuracy of the test results at low maintenance and working expenses is guaranteed.

Description

The machine consists of a solid housing made of high-strength steel into which the test aggregate (test cylinder with work piston, sheet holder plate and die) are integrated. All components are easily accessible from outside the machine, and thus the tools for the individual tests can be changed quickly, too. The operator's controls are well arranged on the control panel. The operating sequence of the testing machine has been designed in such a comfortable manner that cutting of the blank as well as drawing and ejecting of the cup are executed in one single operation.

Accessories (optional)

- Analogue outputs for drawing force, blank holding force and drawing punch stroke for recording of force/displacement curves.
- Interfaces RS 232 C for drawing force, blank holding force and drawing punch stroke.
- PC system including software for data acquisition (using Win 2000/XP) for the ERICHSEN cupping test and the deep-drawing cup test.
- In addition to various test tools for deformation, a Bead Test Instrument, Model 227, as well as a Special Microscope with illumination for the evaluation and observation of the test procedure are available.

Technical Data

Drawing force, max.		100 kN
Blank holding force, max.		45 kN
Drawing punch stroke, approx.		60 mm
Blank holder stroke, approx.		35 mm
Blanking force, max.		200 kN
Opening for sheet insert, max. width		110 mm
Power supply	230/400 V, 3 ~, 50/60 Hz	2.2 kW
Dimensions, approx.	Height	1100 mm
	Width	900 mm
	Depth	800 mm
Weight net, approx.		350 kg

Order Information	
Order No.	**Product Description**
0178.02.31	Cupping and Deep-drawing Cup Test Machine, **Model 212**

Subject to technical modifications. Group 1 - TBE 212 - V/2017

Selection table for drawing dies B1/C2 (#01370132)

valid for **ferritic and non-ferritic** material
(material type nessary for order)
Norm: ERICHSEN

Var.	Thickness s / mm	Var.	Thickness s / mm
1	0,076	28	0,85
2	0,100	29	0,90
3	0,127	30	0,95
4	0,13	31	1,00
5	0,14	32	1,10
6	0,15	33	1,15
7	0,18	34	1,20
8	0,20	35	1,25
9	0,21	36	1,30
10	0,23	37	1,40
11	0,24	38	1,50
12	0,25	39	1,60
13	0,26	40	1,70
14	0,27	41	1,80
15	0,28	42	1,90
16	0,30	43	2,00
17	0,32	44	2,10
18	0,35	45	2,20
19	0,40	46	2,30
20	0,45	47	2,40
21	0,50	48	2,50
22	0,55	49	2,60
23	0,60	50	2,65
24	0,65	51	2,70
25	0,70	52	2,8
26	0,75	53	2,9
27	0,80	54	3,0

Selection table for drawing dies B1/C2 (#01370132)

valid for **aluminium and aluminium aloy**
Norm: DIN EN 1669

valid for Clearance ratio **1,15 bis 1,52**		valid for Clearance ratio **1,34 bis 1,76**	
Var.	Thickness s / mm	Var.	Thickness s / mm
1	0,095 < s ≤ 0,120	1	0,080 < s ≤ 0,100
2	0,121 < s ≤ 0,150	2	0,101 < s ≤ 0,125
3	0,151 < s ≤ 0,185	3	0,126 < s ≤ 0,157
4	0,186 < s ≤ 0,235	4	0,158 < s ≤ 0,195
5	0,236 < s ≤ 0,280	5	0,196 < s ≤ 0,240
6	0,281 < s ≤ 0,345	6	0,241 < s ≤ 0,290
7	0,346 < s ≤ 0,435	7	0,291 < s ≤ 0,360
8	0,436 < s ≤ 0,535	8	0,361 < s ≤ 0,450
9	0,536 < s ≤ 0,665	9	0,451 < s ≤ 0,555
10	0,666 < s ≤ 0,800	10	0,556 < s ≤ 0,670
11	0,801 < s ≤ 0,940	11	0,671 < s ≤ 0,800
12	0,941 < s ≤ 1,130	12	0,801 < s ≤ 0,965
13	1,131 < s ≤ 1,450	13	0,966 < s ≤ 1,250
14	1,451 < s ≤ 1,900	14	1,251 < s ≤ 1,600
15	1,901 < s ≤ 2,350	15	1,601 < s ≤ 2,000
16	2,351 < s ≤ 2,900	16	2,001 < s ≤ 2,400
17	2,901 < s ≤ 3,500	17	2,401 < s ≤ 3,000

Selection table for drawing dies C1 (#01410132)

valid for **ferritic and non-ferritic** material
(material type nessary for order)
Norm: ERICHSEN

Var.	Thickness s / mm	Var.	Thickness s / mm
1	0,076	28	0,85
2	0,100	29	0,90
3	0,127	30	0,95
4	0,13	31	1,00
5	0,14	32	1,10
6	0,15	33	1,15
7	0,18	34	1,20
8	0,20	35	1,25
9	0,21	36	1,30
10	0,23	37	1,40
11	0,24	38	1,50
12	0,25	39	1,60
13	0,26	40	1,70
14	0,27	41	1,80
15	0,28	42	1,90
16	0,30	43	2,00
17	0,32	44	2,10
18	0,35	45	2,20
19	0,40	46	2,30
20	0,45	47	2,40
21	0,50	48	2,50
22	0,55	49	2,60
23	0,60	50	2,65
24	0,65	51	2,70
25	0,70	52	2,8
26	0,75	53	2,9
27	0,80	54	3,0

Selection table for drawing dies square cups 26x26 (#01720132)

valid for **ferritic and non-ferritic** material
(material type nessary for order)
Norm: ERICHSEN

Var.	Thickness s / mm	Var.	Thickness s / mm
1	0,10	20	0,85
2	0,15	21	0,90
3	0,20	22	0,95
4	0,22	23	1,00
5	0,23	24	1,10
6	0,24	25	1,20
7	0,25	26	1,25
8	0,26	27	1,30
9	0,30	28	1,40
10	0,35	29	1,50
11	0,40	30	1,60
12	0,45	31	1,70
13	0,50	32	1,80
14	0,55	33	1,90
15	0,60	34	2,00
16	0,65	35	2,30
17	0,70	36	2,50
18	0,75	37	2,60
19	0,80	38	3,00

Selection table for blanking tools

- consists of blanking die ring (# 01380132) and blanking punch (01390132):

Blanking tool for deep-drawing cups blank cut with punch dia 33 mm (B1):

for ferritic material:
- 55 – 80 mm
- 64 mm recommended
- ISO 11531 approx. 60 mm
- Square cups 26 x 26 mm approx. 60 mm (# 05030132)

for non-ferritic material:
- DIN EN 1669 / 60 or 64 mm

Punching areas for sheet thicknesses of ferritic materials:
- 0,2 – 1,0 mm
- 1,1 – 2,5 mm

Punching areas for sheet thicknesses of non-ferritic materials:
- 0,1 – 0,59 mm
- 0,6 – 1,69 mm
- 1,7 – 3,0 mm

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