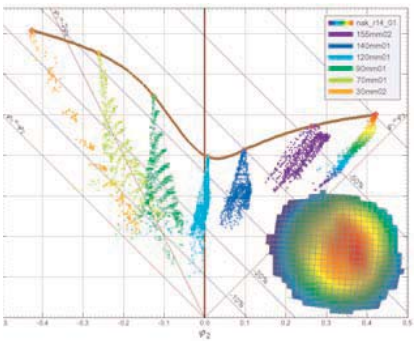


Maximum Strain

Deep Drawing Cup Test

Universal Sheet Metal Testing Machine Model 142-Basic

Square Deep Drawing Cup Test

testing equipment for quality management

ERICHSEN

Technical Description

Extensive
Tools / Accessories

With
electro-hydraulic Drive
Programme Logic Control

Product

Universal Sheet Metal Testing Machine with electro-hydraulic drive, fully automatic test sequence and switch off at specimen failure, max. drawing forces 200 kN or 400 kN - **Model 142-20-Basic** and **Model 142-40-Basic.**

Application

This Testing Machine can be used not only to perform effortlessly, quickly and accurately all important and known deep drawing tests for ferrous and non-ferrous metals, but it is also designed for a large number of additional technological investigations:

ERICHSEN Cupping Test in accordance with

ISO 8490	JIS Z-2247
EN 14-58	JIS Z-7729
EN 14-67	UNI 3037
EN ISO 20482	UNE 7080
BS 3855	GOST 10510
NF A 03-602	ICONTEC 21
NF A 03-652	SIS 11 26 35
ASTM E 643-84	SABS 0132-197
GB 4156-84	

ERICHSEN Deep Drawing Cup Test
in accordance with

ISO 11 531	MSZ 5731-68
DIN 50 155	UNI 6124-67
EN 16-69	JIS Z 2249
GB/T 15825	

on sheet and strips.

Square Cup Test (40 x 40 mm)
Bore Expanding Test (KWI Test)
Bore Expanding Test (ISO 16630)
Olsen Cupping Test
Persoz Cupping Test
Deep Drawing Cup Test acc. to Swift I (32 mm dia.)
Deep Drawing Cup Test acc. to Swift II (50 mm dia.)
Fukui Test
Engelhardt Test
Determination of the Forming Limit Curves (FLC)
LDH Test
Deep Drawing Test with Blankholder Quick Release (for Earing Test)
Deep Drawing Test with Preselected Punch Stroke
Deep Drawing Test at High Temperatures up to 550 °C
Bulge Test (50 mm dia. or 100 mm dia.)
Lubricant Test
Tensile Test
Drift Expanding Test on Tubes acc. to DIN EN 10234
Ring Expanding Test on Tubes acc. to DIN EN 10236
ERICHSEN Cupping Test for Lacquer and Paint in accordance with DIN ISO 1520
Stamping Lacquer Test and Deep Drawing Cup Test on Coil Coatings

Description

The **Universal Sheet Metal Testing Machine, Model 142-Basic**, 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.

The Testing Machine is driven electro-hydraulically. The test sequence can be controlled automatically or manually, as desired. A programmable logic controller is used to control the functions of the machine. The testing machine is equipped with digital displays for indicating the sheet holder force, the drawing force. as well as the drawing punch stroke.

The triple-acting hydraulic system in conjunction with the general design results in the following cost saving simplifications:

- Blanking press in the test head
- Hydraulic cup ejector
- Fully-automatic test sequence with stop at specimen failure (as of 0.3 mm sheet thickness).

Further technical advantages:

- *Cylinder head with bayonet lock*
  permitting direct access to drawing dies, blanking rings, blank holders etc. and quick and convenient changing of the drawing and blanking tools.

- *Cardanic retention*
  ensures the consistent, parallel clamping of the specimen, independent of variations in thickness.

The Sheet Metal Testing Machine, **Model 142-Basic**, was developed for testing as a means for continuous production control using standardised and other established methods.

Additional Control Functions and Test Methods

Upon request, **Model 142-Basic**, can be equipped with data evalution system and PC (incl. software pack).
(figure see next page)

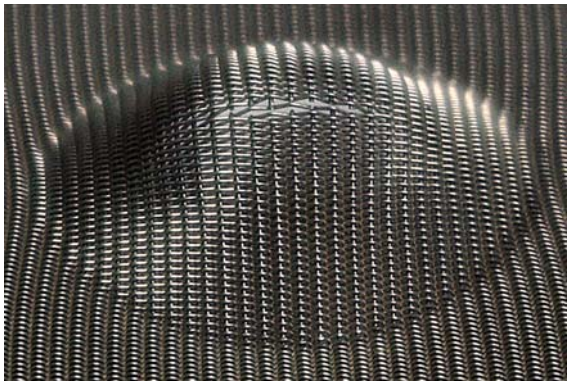


Fig. 1 – ERICHSEN Cupping Test on metallic tissue

Hot Drawing Equipment up to 550 °C

A further valuable addition to the possibilities offered by **Model 142-Basic** is provided by the additional hot drawing equipment *(Fig.2)*.

In this, the blankholder and drawing die are heated in an insulated container and special provision is made to enable these then to be set up without difficulty on the machine.
An electronic temperature measuring device is incorporated, and on this the preset intended temperature and the current measure temperature are displayed. The preset temperature can be set up to 550 °C, and in the test, the temperature remains constant within ± 10 °C.

Fig. 2

Technical Data

Drawing force	142-20	200 kN
	142-40	400 kN
Blanking force	142-20	265 kN
	142-40	600 kN
Blankholder force	142-20	2 to 40 kN or 15 to 100 kN
	142-40	3 to 100 kN or 20 to 220 kN
Drawing punch stroke	142-20	approx. 80 mm
	142-40	approx. 120 mm
Blankholder stroke		approx. 38 mm
Drawing punch dia.	142-20	up to 50 mm
	142-40	up to 75 mm
FLC test (drawing punch-ø)		up to 100 mm
Bulge test (bulge-ø)		up to 100 mm
Blank diameter	142-20	up to 120 mm
	142-40	approx. 170 mm
Drawing speed		approx. 500 mm/min
Digital displays		Resolution:
Drawing punch stroke		0.1 mm
Drawing force		0.1 kN
Blankholder force		0.1 kN
Mains supply		230 V / 400 V / 3 ~, 50 Hz (other voltages on request)
Power required	142-20	approx. 3.0 kW
	142-40	approx. 7.5 kW
Dimensions (H x W x D)		approx. 1280 x 800 x 1150 mm
Weight, net	142-20	approx. 350 kg
	142-40	approx. 650 kg
Working material		approx. 95 l hydraulic oil (HLP 32 ISO) - must be provided by the user

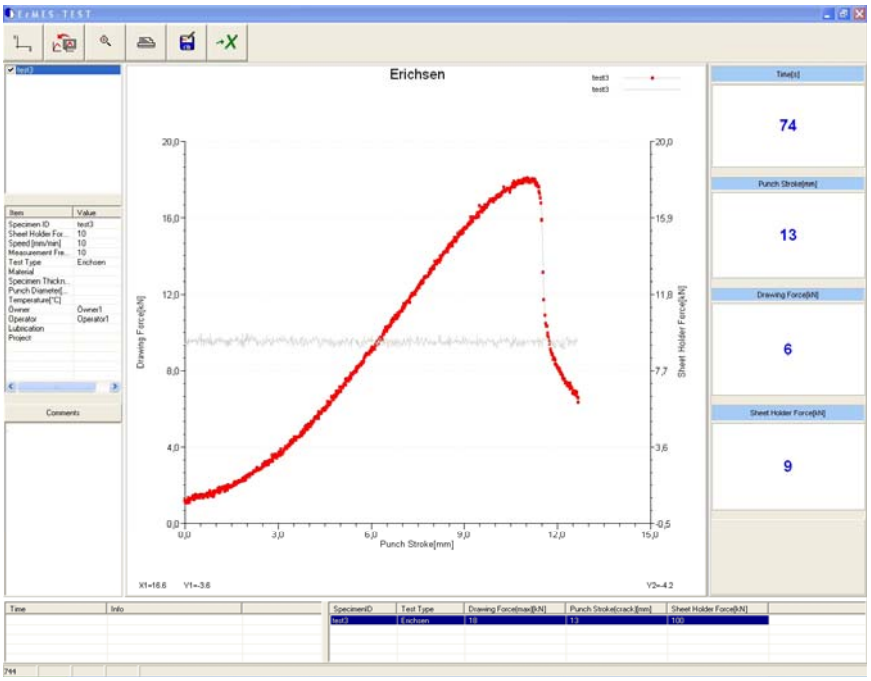
For the ERICHSEN Cupping Test and other test specifications a user test software is available as option:

The ERICHSEN Cupping Test (in accordance with EN ISO 20482, and corresponding to national and international standards) is a test providing simple and quick means of assessing the multi-axis ductility of sheet and strip using a procedure that relates closely to practical processes. The depth range reached at failure is, however, only an initial guide to the evaluation of the forming properties of the sheet metal.

From the Universal Sheet Testing Machine, **Model 142-Basic**, (as is the case with all the modern electro-hydraulic ERICHSEN Testing Machines) the data from the analogue outputs for

- drawing punch movement,
- drawing force, and
- blankholder force,

are sent to an integrated amplifier with A/D converter. These components are connected via USB port to a computer. The graph of the force/displacement diagram will be displayed on the VDU.



Data Evalution System with User Test Software

The software enables the continuous acquisition of measured values with simultaneous display of the force/displacement diagram throughout the forming process. The data recording will be stopped after the maximum force is achieved in a cupping test or the deep draw test is finished.

This data is presented immediately on the VDU on completion of the test alongside the graph of the force against displacement.

Either a printout can then be obtained and the data saved or the data can be easily transfered to other evaluation programmes (e.g. Microsoft Excel).

The scope of supply includes PC, VDU and printer.

TBE 142-Basic – XI/2010

ERICHSEN GmbH & Co. KG
Am Iserbach 14 | 58675 Hemer | Germany | Tel. +49(0)2372-9683-0 | Fax +49(0)2372-6430 | www.erichsen.de | info@erichsen.de