TLS

COMPRESSION TESTING MACHINES

KVALITEST INDUSTRIAL

BY TECHLAB SYSTEMS

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TESTS

- BCT (Constant Speed)
- STACKING (Constant Load)
- CYCLES (Force & Deformation)

BCT Constant Speed

The primary task for any packaging is to minimize the damage that could occur after a product has left the production line

Simulation of the maximum compression strength that a package can resist. The compression test measures the compressive strength of packages such as boxes, drums, cans and packages in general

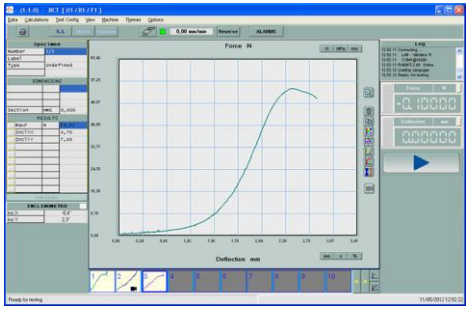
The BCT is the most common test performed to determine the stacking strength of the packaging. The Compression Tester measures the breaking point doing a compression test at a constant speed

It usually provides a curve of compressive Force Vs. Deformation

BCT Constant Speed

For the BCT we will need to define the following parameters:

- **Preload:** the force to be applied before starting the test
- **Fall %:** The test stops when the force value falls by the same percentage of the maximum force recorded during the test
- **Speed** during the test



STACKING Constant Load

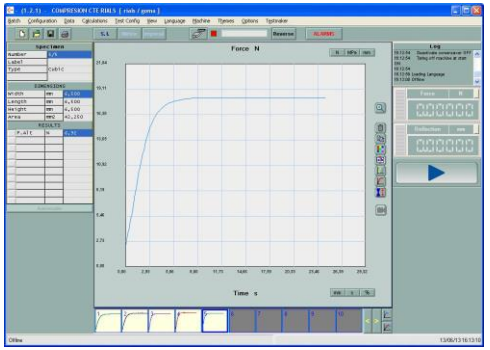
One of the most important functions of any package is to provide crush resistance, product protection and adequate strength for stacking in warehouses and distribution channels.

The Stacking Test simulates the maximum compression force, according to content weight and stacking height.

The package must be subjected to a constant load applied to the top surface of the test sample equivalent to the total weight of identical packages which might be stacked on it during shipment.

STACKING Constant Load

The minimum height of the stack, including the test sample, must be three meters and the duration of the test must be twenty four hours, with some exceptions with twenty eight days duration



For the Stacking Test we will need to define the following parameters:

- **Target Value:** the force to be applied constantly over the test time
- **Time:** Duration of the constant load during the test

CYCLES

Fatigue is the progressive and localized structural damage that occurs when a material is subjected to cyclic loading or deformation.

The Fatigue happens when a material experiences a Force Cycles Test (repeated loading & unloading) or Deformation Cycles (repeated deformation & relaxation).

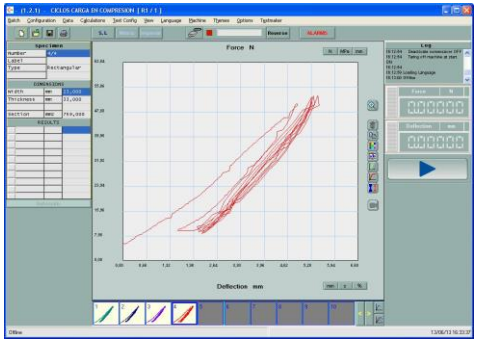
In the case of Force Cycles, we will need to define the following parameters:

- **Initial Force:** Force to be applied to the test sample at the start of the section
- **Final Force:** Force to be applied to the test sample at the end of the section
- **Number of Cycles**
- **Time** elapsed between each cycle
- **Speed** during the section

CYCLES

In the case of Deformation Cycles, we will need to define the following parameters:

- **Initial Deformation:** Deformation to the test sample at the start of the section
- **Final Deformation:** Deformation to the test sample at the end of the section
- **Number of Cycles**
- **Time** elapsed between each cycle
- **Speed** during the section



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INTERNATIONAL STANDARDS

Guidelines or standards developed by an organization for use worldwide

STANDARDS

ASTM D642

Standard test method for determining compressive resistance of shipping containers, components and unit loads

ASTM D4169

Standard practice for performance testing of shipping containers and systems

ASTM D4577

Standard test method for compression resistance of a container under contant load

ASTM 7030

Standard test method for short term creep performance of corrugated fiberboard container under contant load using a compression test machine

STANDARDS

TAPPI T804

Compression test of fiberboard shipping container

ISO 12048

Packaging – Complete, filled transport packages – Compression and stacking test using a compression tester

FEFCO 50

Determination of the compression resistance of corrugated fiberboard containers

DIN 55440-1

Packaging test; compression test; test with a constant conveyance-speed

STANDARDS

DIN EN 22872

Packaging – Complete, filled transport packages – Compression test specifies two methods for testing complete, filled transport

ISTA Series

Transport simulation performance tests

49 CFT 178.606

Code of Federal Regulations – All packaging design type other than bags must be subjected to a stacking test

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MACHINES

- Models
- Capacity
- Platen size and stroke

MINIVAL

500 x 500 mm platens

500 mm stroke

Capacity: 10 kN

VALIDATOR

800 x 800 mm platens

910 mm stroke

Capacity: 25 kN

VALIDATOR PLUS

1000 x 1000 mm platens

1000 mm stroke

Capacity: 30 & 50 kN

VAL-30: 1250 x 1250 x 1250 mm and 30kN Capacity

VAL-50: 1250 x 1250 x 1250 mm and 50kN Capacity

VAL-100: 1550 x 1550 x 1550 mm and 100kN Capacity

VAL-150: 1550 x 1550 x 1850 mm and 150kN Capacity

VAL-300: 1850 x 1850 x 2150 mm and 300kN Capacity

NOTE: TECHLAB SYSTEMS is able to manufacture a customized machine according to your testing needs

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SPECIAL FEATURES

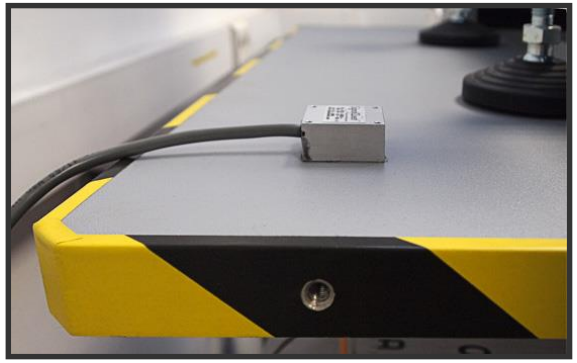
- Inclination recording system
- Fixed & Oscillating platen system

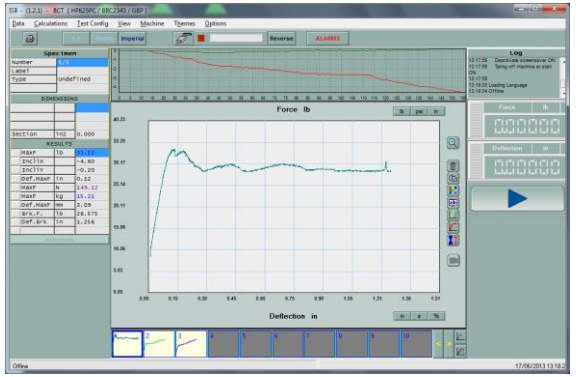
INCLINATION RECORDING SYSTEM

The inclinometer fits easily on the top compression platen

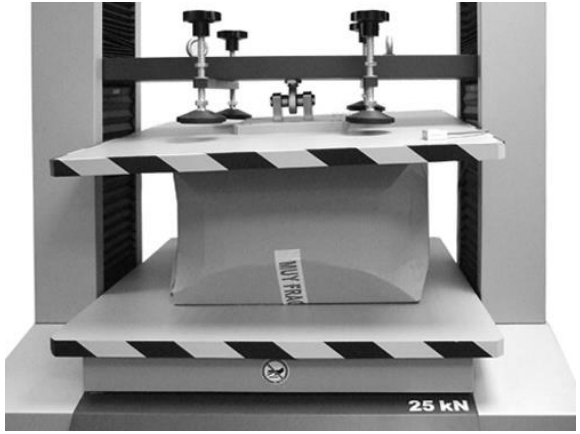
Numerical presentation of angles inclination in X/Y axis

Graphical presentation of inclination evolution





FIXED & OSCILLATING PLATEN SYSTEM



WORLWIDE REFERENCES

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- Consumer Packaging
- Packaging Manufacturers
- R&D Centers & Universities

CONSUMER PACKAGING

✓ ADOLF WÜRTH	Germany
✓ ALFRED KÄRCHER	Germany
✓ BLACK & DECKER	USA
✓ BECTON DICKINSON	Spain
✓ BEKO	UK
✓ BSH	USA
✓ CANON CORP.	USA
✓ CHINA TOBACCO	China
✓ COCA COLA	USA
✓ DANONE	Tunisia
✓ DELPHI	Mexico
✓ DURAVIT	Egypt
✓ FERRERO ROCHER	Belgium
✓ GENERAL ELECTRIC	USA
✓ GENERAL MILLS	China
✓ HENKEL	USA
✓ HERSHEY FOODS	USA
✓ HP Hewlett-Packard	China
✓ HUAWEI	China

✓ IBM	USA
✓ ICON HEALTH & FITNESS	USA
✓ JOHNSON & JOHNSON	USA
✓ KOHLER COMPANY	USA
✓ LEXMARK	USA
✓ LG ELECTRONICS	Mexico
✓ L'OREAL	USA
✓ M&M MARS	USA
✓ NATIONAL INSTRUMENTS	USA
✓ NESTLE	USA
✓ NOKIA MOBILE PHONES	Finland
✓ PARFOUMS CHRISTIAN DIOR	France
✓ PEPSICO	USA
✓ PROCTER & GAMBLE	USA
✓ RENAULT	France
✓ RECKIT BENCKISER	Portugal
✓ SAMSUNG ELECTRONICS	South Korea
✓ UNILEVER	Germany
✓ WHIRLPOOL CORPORATION	China

PACKAGING MANUFACTURERS

✓ AMCOR FIBRE PACK.	Australia
✓ BIO PAPPEL PACKAGING	Mexico
✓ CARTONES AMERICA	Colombia
✓ CECSO GROUP	Mexico
✓ CMPC GROUP	Chile
✓ DUNAPACK PACK.	Turkey
✓ DS SMITH PACK.	Belgium
✓ EUROPA&C GROUP	Spain
✓ GALINDO GROUP	Guatemala
✓ GEORGIA PACIFIC	USA
✓ GENERAL EMBALLAGE	Algerie
✓ GLOBAL PACKAGING	Costa Rica
✓ GONDI GROUP	Mexico
✓ GRAPHIC PACKAGING	USA
✓ GREAT NORTH. CORP.	USA
✓ GREEN BAY PACKAGING	USA
✓ I.M.A. CORRUGATED	Israel
✓ INDEVCO GROUP	Saudi Arabia
✓ INTERNATIONAL PAPER	USA
✓ KAPSTONE CONTAINER	USA
✓ LONGVIEW FIBRE PACK.	USA
✓ MODERN AMBALAJ	Turkey
✓ MONDI GROUP	Turkey
✓ PACK. CORP. OF AMERICA	USA
✓ ROSSMAN GROUP	France
✓ ROSHAN PACKAGES	Pakistan
✓ SAICA PACK	Spain
✓ SCHUMACHER PACKAGING	Germany
✓ SFT GROUP	Russia
✓ SMURFIT KAPPA GROUP	Mexico
✓ SONOCO PRODUCTS	USA
✓ STONE CONTAINER	USA
✓ VICTORY PACKAGING	USA
✓ VISY BOARD	New Zealand
✓ VPK PACKAGING GROUP	Norway
✓ WESTROCK COMPANY	USA
✓ WEYERHAUSER COMPANY	USA
✓ ZUCAMOR	Argentina

R&D CENTERS & UNIVERSITIES

✓ AMERICAN TESTING LAB.	USA
✓ ARKHANGELSK UNIV.	Russia
✓ ASSOC. TESTING LAB.	USA
✓ BATTELLE NORTHW. LAB.	USA
✓ C.A.T.A.S. SPA	Italy
✓ CHINESSE INSPECTION	China
✓ CITMA	Spain
✓ COMPADRE TESTING LAB.	USA
✓ CONCEPCION UNIV.	Chile
✓ DANISH TECH. INSTITUTE	Denmark
✓ DFAS COLUMBUS CENTER	USA
✓ ESCUELA PAPEL TOLOSA	Spain
✓ HASSELT UNIVERSITY	Belgium
✓ INKUBATOR TEKNOLOGI	Malaysia
✓ ITENE	Spain
✓ ITC LIMITED	India
✓ INDIANA STATE UNIV.	USA

✓ INDIAN INSTITUTE PACK.	India
✓ INST. CORK & WOOD	Spain
✓ I.N.T.I.	Argentina
✓ I.N.T.N.	Paraguay
✓ NAMSA	USA
✓ PACKTEC	Tunisia
✓ PACONSULT Gmbh	Germany
✓ PRO-PACK TESTING LAB.	USA
✓ ROBINS AIR FORCE BASE	USA
✓ SMITHER PIRA	UK
✓ TEN-E PACKAGING SERV.	USA
✓ UNIV. OF GUADALAJARA	Mexico
✓ UNIV. OF WINSCONSIN	USA
✓ UNIV. CATOLICA PORTO	Portugal
✓ US ARMY TOBYHANNA	USA
✓ XIAMEN TESTING INSTITUTE	China
✓ ZHEJIANG FANGYUAN TEST	China

TLS

10 to 300kN Force Capacity

800 systems installed worldwide

80 Countries over 5 Continents

CE Compliant

Customized solutions

Integrated & flexible Testing software

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20100 Lezo
SPAIN

1549 Ardmore Avenue
60143 – Itasca - Illinois
USA