

Test&Motion

Application Module:

HO 3 – 3-/4 Point Bending test for wood
acc. DIN 52 186



Version 1.0 (State 20160819)

DOLI Elektronik GmbH

Corporate name:	DOLI Elektronik GmbH
Headquarters:	Adi-Maislinger-Straße 7, 81373 München, Germany
	☎ +49-89-20243-0
	Fax +49-89-20243-243
	E-Mail info@doli.de
Sales:	E-Mail sales@doli.de
Production:	Ulmer Straße 34, 89584 Ehingen, Germany
	☎ +49-7391-58039-0
	Fax +49-7391-58039-71
	E-Mail ehi@doli.de
Internet:	www.doli.de
	www.flexometer.com

Contents:

1 INTRODUCTION5

1.1 Symbols5

2 APPLICATION MODULE HO 3: 3-/4 POINT BENDING TEST FOR WOOD ACC. DIN 52 1866

2.1 Field of application6

2.2 Test graphic HO 36

2.3 Input values HO 3.....7

2.4 Results HO 38

2.5 Hints for the test HO 3.....9

2.5.1 Pre-load F09

2.5.2 Input values E1 and E2.....9

2.5.3 Test end Smax.....9

2.5.4 Calculation of bending modul.....9



1 Introduction

Dear customer, thank you for choosing a product of **DOLI Elektronik GmbH**. **Test&Motion** is a modern application for the operating systems Microsoft Windows XP/7/8/10®.

This manual does not deal with the **Test&Motion software** in general but with the application module Plastics Tensile Test HO 3 in particular. Hence, it is recommended to read the **Test&Motion** application manual in order to get familiar with the software. Please follow the demands and safety hints listed in the manual!

1.1 Symbols

The different symbols in this manual will allow you to find your way more easily.

Table 1: Symbols and their meanings.

Symbol	Meaning
	Safety Instructions: In order to avoid interruptions in the work flow as well as damages to man and machine, follow the safety instructions at all cost.
	Job/work instructions: Instructive part of the document with precise work instructions. Here you are asked to do something.
	Information: General information and descriptions of working procedures, etc.
	Note: Important note for the operation, the function or for the working procedures.
	Tip: Gives tips for easy handling of the Test&Motion Software , the EDCs or the testing instrument.

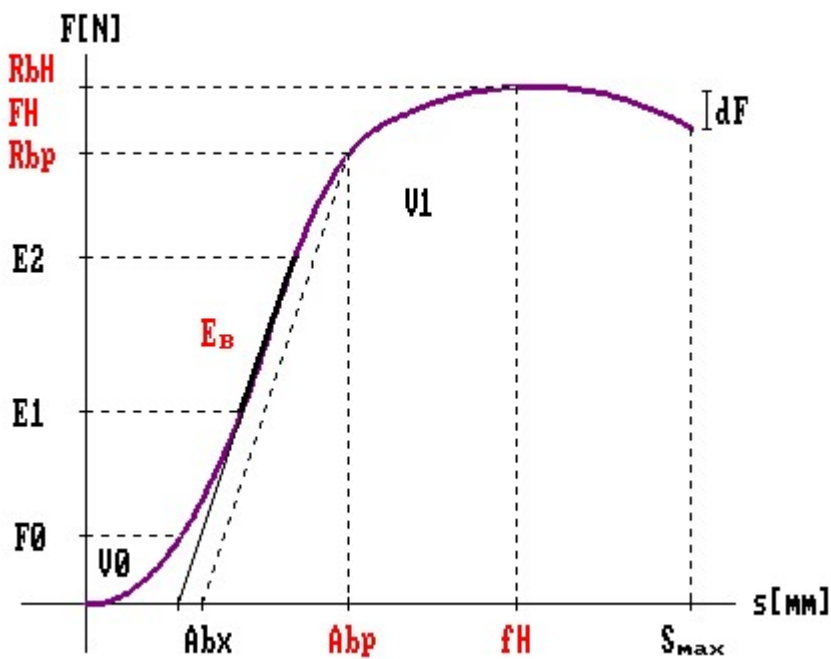


2 Application module HO 3: 3-/4 Point Bending test for wood acc. DIN 52 186

2.1 Field of application

Determination of bending strength, maximum force, Elasticity module and deflection on wood in 3-/4 point bending test acc. DIN 52 186.

2.2 Test graphic HO 3





2.3 Input values HO 3



1. Click [Menu Test](#) → [Command Settings](#) → [Input values](#). Here you can find expedient input values for this test regulation, already. If necessary adjust the values to your needs.

Table 2: Input values for test HO 3.

Parameter	Meaning	Dimension / Selection possibilities
E1	Limit 1 for calculation of modul	[N, kN], [N/mm ²]
E2	Limit 2 for calculation of modul	[N, kN], [N/mm ²]
Abx	Non-proportional extension for calculation of output values Abp (Edge fibre extension) and Rbp (Offset yield stress)	[%]
Choice:	Kind of test	• 3 point bending test • 4 point bendingtest
Choice:	Search modul	• Automatic • 10-40 % of FH • Between input value E1 and E2



2.4 Results HO 3



1. Click [Menu Test](#) → [Command Settings](#) → [Results](#). Here you can already find expedient results. If necessary, adjust the values to your needs.

Table 3: Results for test HO 3.

Parameter	Meaning	Dimension
RbH	Bending strength at max force	[N/mm ²]
FH	Max. force	[N]
Rbp	Offset yield stress at non-proportional extension Abx	[N/mm ²]
Eb	Bending modul	[N]
Abp	Edge fibre extension at Abx	[%]
fH	Deflection at FH	[mm]
S0	Cross section of sample	[mm ²]
l	Sample length	[mm]
b	Sample width	[mm]
h	Sample height	[mm]
m	Weight	[g]
Rho	Density of sample	[g/cm ³]



2.5 Hints for the test HO 3

2.5.1 Pre-load F0

For the test control, the elongation and the strain will be set to zero when pre-load F0 is reached (see explanations about elongation and strain further down, also).

2.5.2 Input values E1 and E2

If modul limits between input values E1 and E2 you have to enter these values.

If the modul is searched automatically, you do not need to enter these values.

2.5.3 Test end Smax

In compression– or bending test it is better to activate this test end criterion maximum Xhead travel path (for security).

2.5.4 Calculation of bending modul

The bending modul Eb in 3 point bending test is calculated acc. following formula:

$$Eb = \frac{Lv^3}{4 b h^3} * \frac{F2 - F1}{f2 - f1}$$

The bending modul Eb in 4 point bending test is calculated acc. following formula:

$$Eb = \frac{Lv^3 - 3Lv Lk^2 + Lk^3}{8 b h^3} * \frac{F2 - F1}{f2 - f1}$$

Lv support width in [mm]

Lk distance between upper force lines in [mm]

