

Test&Motion
Application Module

**KU 15 – Tear strength of conventional vulcanized
rubber and thermoplastic elastomers (D624-00)**

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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 7/10®.

This manual does not deal with the **Test&Motion software** in general but with the application module **KU 15** 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 meaning.

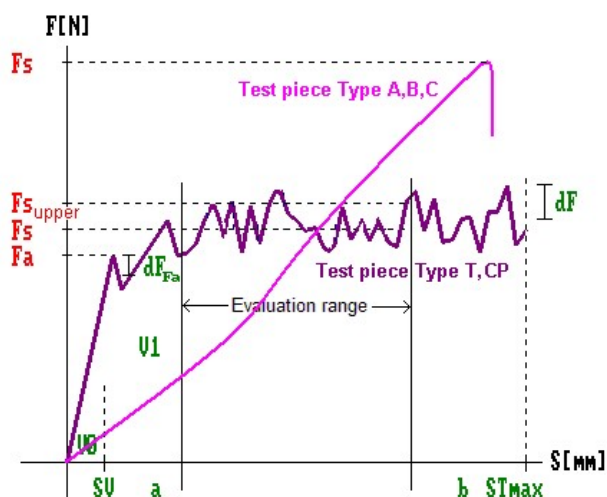
Symbol	Meaning
	Safety Instructions: In order to avoid interruptions in the work flow as well as damages to man and machine, follow the safety instructions at all cost.
	Job/work instructions: Instructive part of the document with precise work instructions. Here you are asked to do something.
	Information: 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 KU 15 – Tear strength of conventional vulcanized rubber and thermoplastic elastomers (acc. to ASTM D624-00)

2.1 Field of application

Determination of tear strength of conventional vulcanized rubber and thermoplastic elastomers.

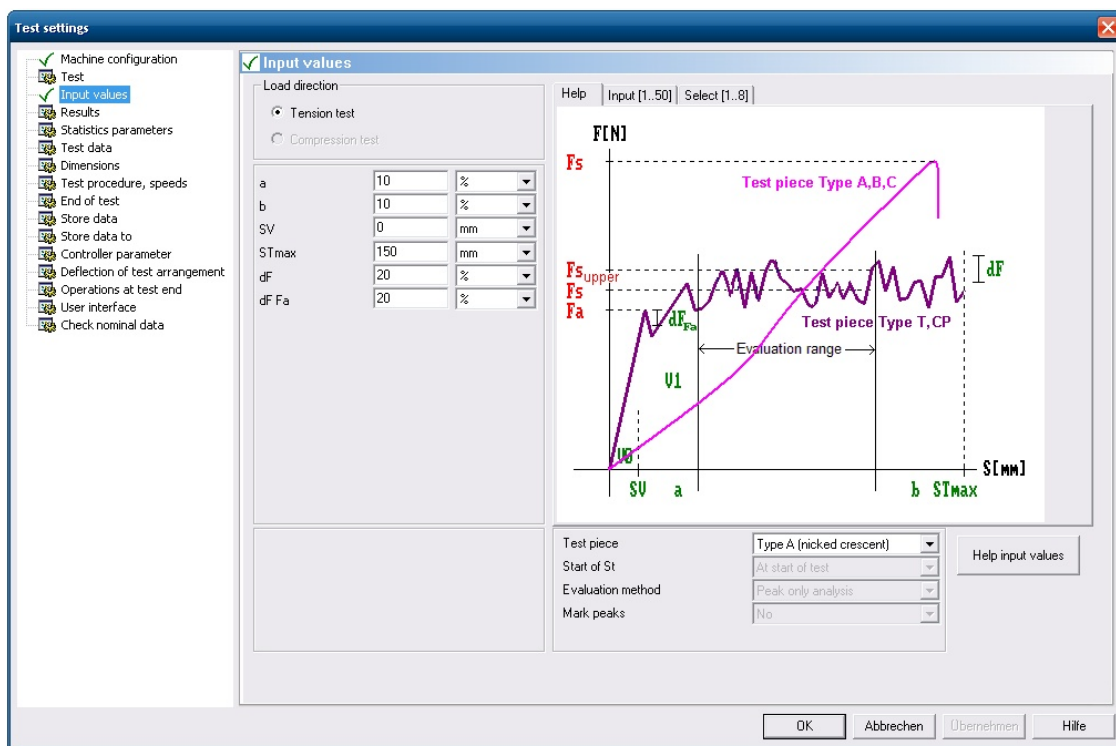
2.2 Test graphic KU 15



2.3 Input values KU 15



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



The button 'Help input values' opens a help page containing all input values and their meanings, as they are explained in the following tables, also.

Table 2: Input values for test KU 15.

Parameter	Meaning	Dimension / Selection possibilities
a	Start of evaluation range	[%] of STmax or [mm] absolute
b	End of evaluation range	[%] of STmax or [mm] absolute
SV	Preliminary separation path	[mm]
STmax	Maximum separation path	[mm]
dF	Force drop for recognition of the force peaks	[%] or [N, kN]
dF Fa	Force drop for recognition of the first force peak	[%] oder [N, kN]
The following input values can be found in dialog Test procedure, speeds (Menu Test → Command Settings)		
F0	Preliminary force	
V0	Test rate until preliminary separation path or first loadpeak is reached	
V1	Test rate after reaching preliminary separation path or first loadpeak	

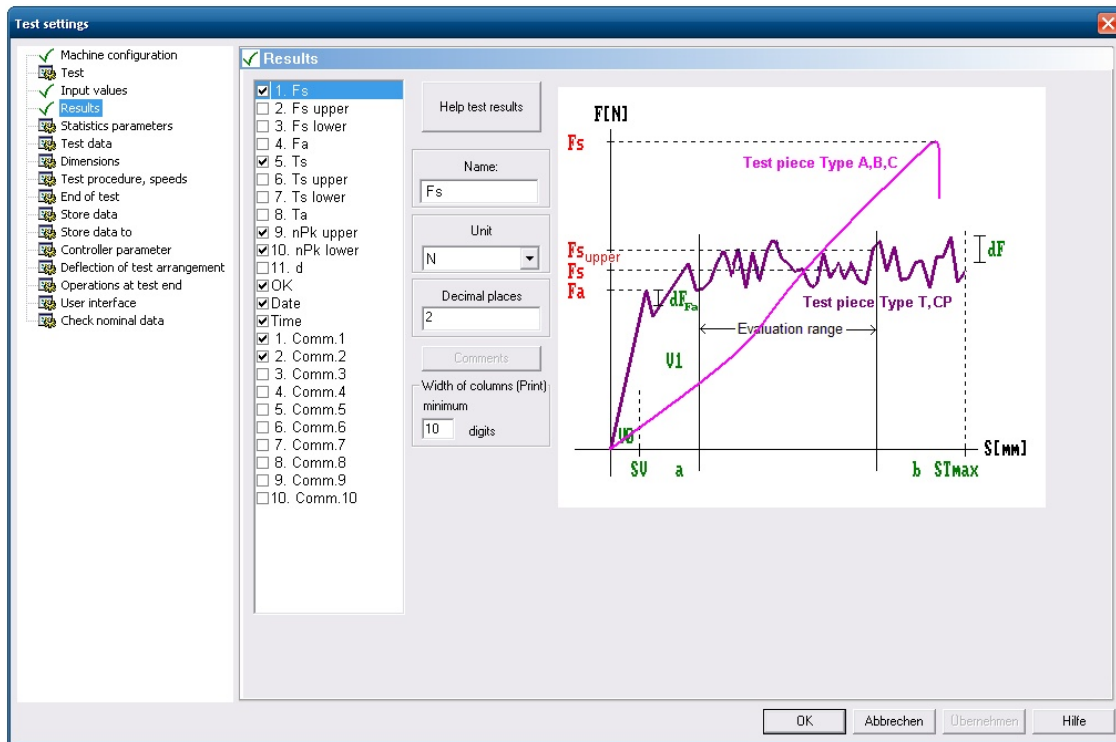
Table 3: KU 15 Selections and their meanings.

Selection	Meaning
Test piece	
Type A	Nicked crescent
Type B	Nicked tab end
Type C	Right angle
Type T	trouser
Type CP	Constrained path
Start of St	Beginning of the separation path. The given choice depends on the chosen test piece.
Evaluation method	Evaluation method for Fs, Ts. The given choice depends on the chosen test piece.
	Peak only analysis
	Valley only analysis
	Mean force analysis
	Peak and valley analysis
	Total work analysis
	Manual curve analysis, type a curve
	Manual curve analysis, type b curve
Mark peaks	Definition, whether peaks should be marked. The given choice depends on the chosen test piece.
	No
	All peaks
	Peaks for eval. (peaks in the evaluation range)

2.4 Results KU 15



2. Click **Menu Test → Command Settings → Results**. Here you can already find expedient results. If necessary, chose and adjust the values to your needs.



- By clicking on one of the test results in the list, you can change its unit, decimal places and width of columns for the printout in the fields beside the list, if necessary.

The button 'Help test results' opens a help page containing all output values and their meanings, as they are explained in the following tables, also.

Table 4: Results for test KU 15.

Parameter	Meaning
Fs	Further tearing force (median force) in the evaluation range
Fs upper	Mean value of the upper force peaks in the evaluation range
Fs lower	Mean value of the lower force peaks in the evaluation range
Fa	Initial tearing force / Static friction force (first force peak)
Ts	Resistance to further tearing or separation resistance $T = F / b$, (sample width)
Ts upper	$Ts \text{ upper} = Fs \text{ upper} / b$
Ts lower	$Ts \text{ lower} = Fs \text{ lower} / b$
Ta	$Ta = Fa / b$
nPk upper	Further tearing force (median force) in the evaluation range
nPk lower	Mean value of the upper force peaks in the evaluation range

2.5 Notes for test KU 15

2.5.1 Separation path

The separation path ST always corresponds to half of the travelled crosshead path S.

$$ST = \frac{1}{2} S \text{ or } S = 2 * ST$$

2.5.2 STmax

STmax is the maximum separation or further tearing path; the test ends when this values has been reached.

STmax = $\frac{1}{2}$ Smax (the maximum separation path corresponds to half the crosshead path travelled during the test, if the separation path ST starts at the beginning of the test; see the following hint).

2.5.3 Beginning of the separation path ST

- From start of test:
The separation path counts from the start of the test. In this case, the separation path is equal to half the crosshead path. The test starts immediately with test rate V1; V0 is not employed.
- From preliminary separation path SV:
The separation path counts from the entered preliminary separation path. The test starts with test rate V0 and is continued on reaching the preliminary separation path with V1
- From 1 force drop:
The separation path counts from the first force peak. The test starts with test rate V0 and is continued on reaching the first force peak with V2

2.5.4 Test pieces type A, B, C

For test piece type A, B and the max. load of the test is Fs.

2.5.5 Test pieces type T, CP

For test piece type T, CP the load evaluated by different methods in evaluation range is Fs.