Test&Motion
Application Module

KU 18 – Tests of tire cords and industrial filament yarns (D885/D885M-10a)

Version 1.5 (State 22.04.2015)

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Contents:

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 18** 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.

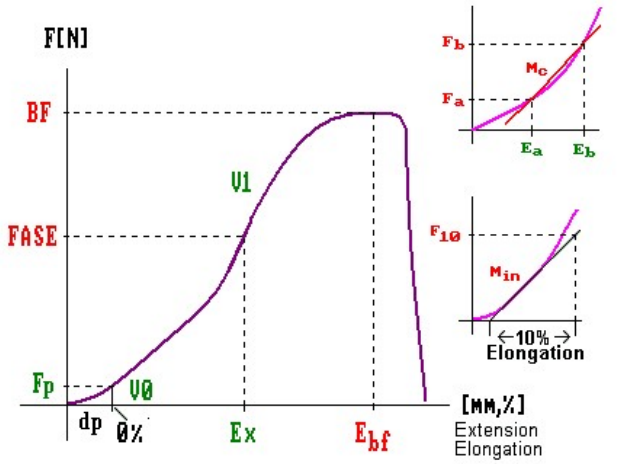
Symbol	Meaning
	**Safety Instructions:** **In order to avoid interruptions in the work flow as well as damages to man and machine, follow the safety instructions at all cost.**
	**Job/work instructions:** **Instructive part of the document with precise work instructions.** **Here you are asked to do 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 18 – Standard test tire cords and industrial filament yarns (acc. to ASTM D885/D885M-10a)

2.1 Field of application

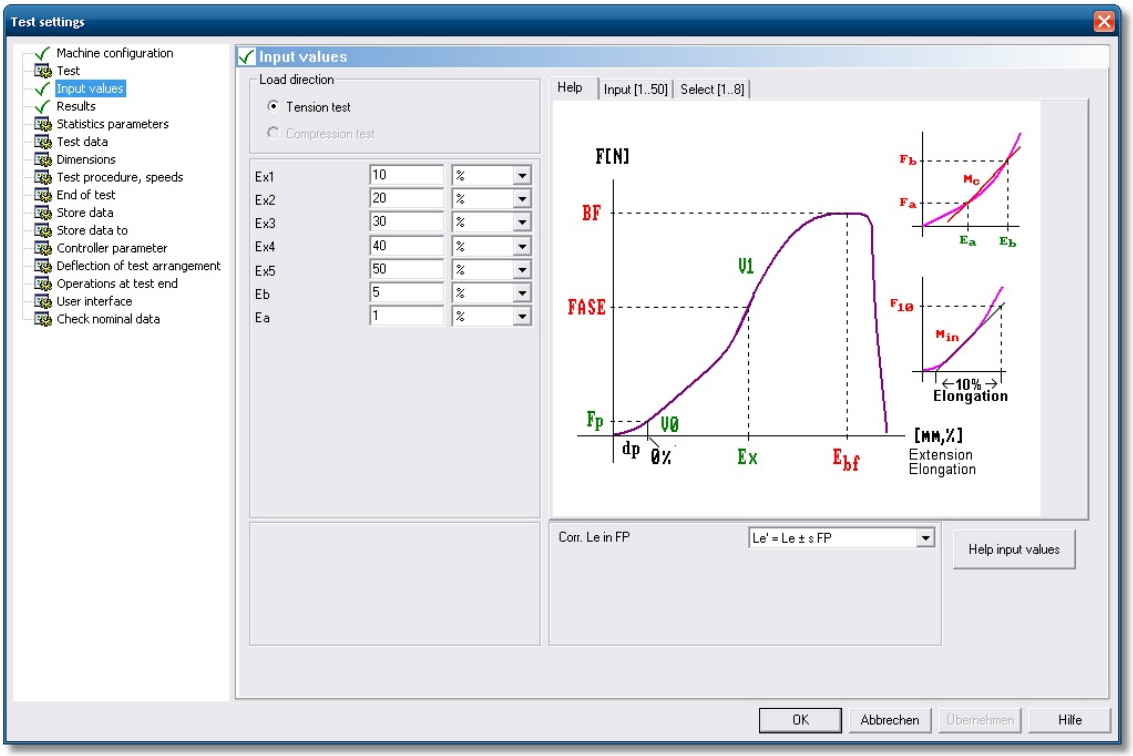
These test methods cover the testing of industrial filament yarns made wholly of manufactured organic-base fibers, cords twisted from such yarns, fabrics woven from such cords, and products that are made specifically for use in the manufacture of pneumatic tires.

2.2 Test graphic KU 18



2.3 Input values KU 18

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 18.

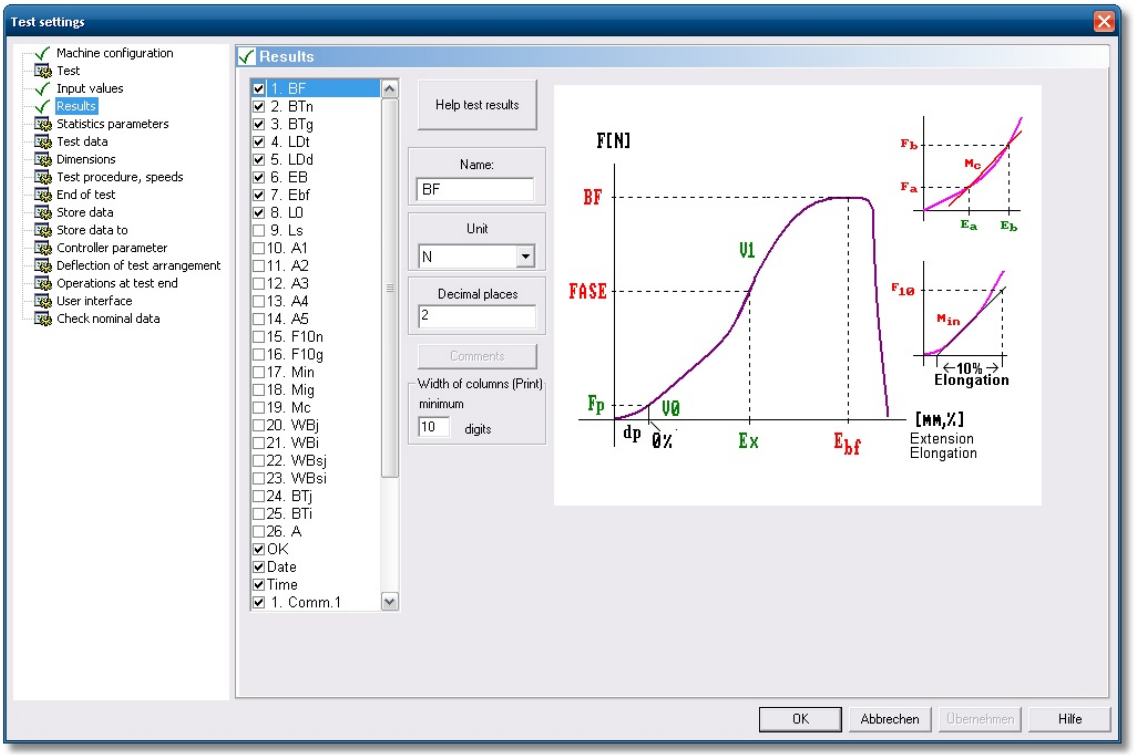
Parameter	Meaning	Dimension / Selection possibilities
Ex1	Reference value to determine FASE 1	[N, kN], [N/mm²], [%]
Ex2	Reference value to determine FASE 2	dimensions analog E1
Ex3	Reference value to determine FASE 3	…
Ex4	Reference value to determine FASE 4	…
Ex5	Reference value to determine FASE 5	…
Eb	Limits to determine the chord modulus Mc	
Ea	Limits to determine the chord modulus Mc	
The following input values can be found in dialog Test procedure, speeds (Menu Test → Command Settings)		
F0	Preload (preliminary force)	[N]
V0	Test speed up to preload F0	[mm/min]
V1	Test speed after reaching preload F0	[mm/min], [N/s]

Table 3: KU 18 Selections and their meanings.

Selection	Meaning
Corr. Le in FP	define the correction mode of value Le in point FP
Le’ = Le – s FP	
Le’ = Le	

2.4 Results KU 18

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



3. By clicking on one of the test results in the list, you can change its unit, decimal places and width of colums 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 18.

Parameter	Meaning
BF	Breaking strength (force)
BTn	Breaking tenacity, mN/tex
BTg	Breaking tenacity, gf/den
LDt	measured linear density, tex
LDd	measured linear density, den
EB	elongation at break, %
Ebf	extension at breaking force, mm
L0	Length of specimen under Fp
Ls	Length of specimen before movement of crosshead
A1	Reference value for input value E1
A2	Reference value for input value E2
A3	Reference value for input value E3

A4	Reference value for input value E4
A5	Reference value for input value E5
F10n	force at 10% elongation, N
F10g	force at 10% elongation, lbf
Min	initial modulus, mN/tex
Mig	initial modulus, gf/den
Mc	chord modulus, mN/tex, gf/den
WBj	work to break, J
WBi	work to break, in * lbf
WBsj	specific work to break, J
WBsi	specific work to break, in * lbf
BTj	breaking toughness, J/g
BTi	breaking toughness, lbf/in * den
A	area under force-elongation curve, mm2, in2

2.5 Notes for test KU 18

2.5.1 Preload F0

For the test control the deflection is set to zero at this point.

Switching over point of the test rate V0 to V1

2.5.2 Limits for determination of the Young's Modulus

You can chose between the following:

1. Acc. EN 789 determine limits automatically:
   In this case, the limits are calculated between 10% and 40% of peak load.
2. Input values: The user have to enter input values Ea and Eb.

2.5.3 Deflection u

During test (online):
The deflection before reaching preload F0 is equal to 0.
The path measured with the extensometer (stylus) is deflection u

A**fter test (offline):**
Upon test end, the deflection is calculated again. Here the zero point of deflection is defined by the intersection point of Young's Modulus and the x-Axis.

3 Document versions

Version	Changes	Date	Name
1.0	First edition	*20131024*	*HH*
1.1		*20131029*	*HH*
1.2	Small changes like graphic curves	*20131101*	*HH*
1.5	Correction capture 5.1	*20131104*	*ALF*
1.6	New feature “start position rolls”, see capture 5 KU 16r	*20130810*	*ALF*
1.7	Changed procedure “start position rolls” capture 5 KU16r	*20150918*	*ALF*
1.8	Change procedure “KU16r”	*20160322*	*ALF*