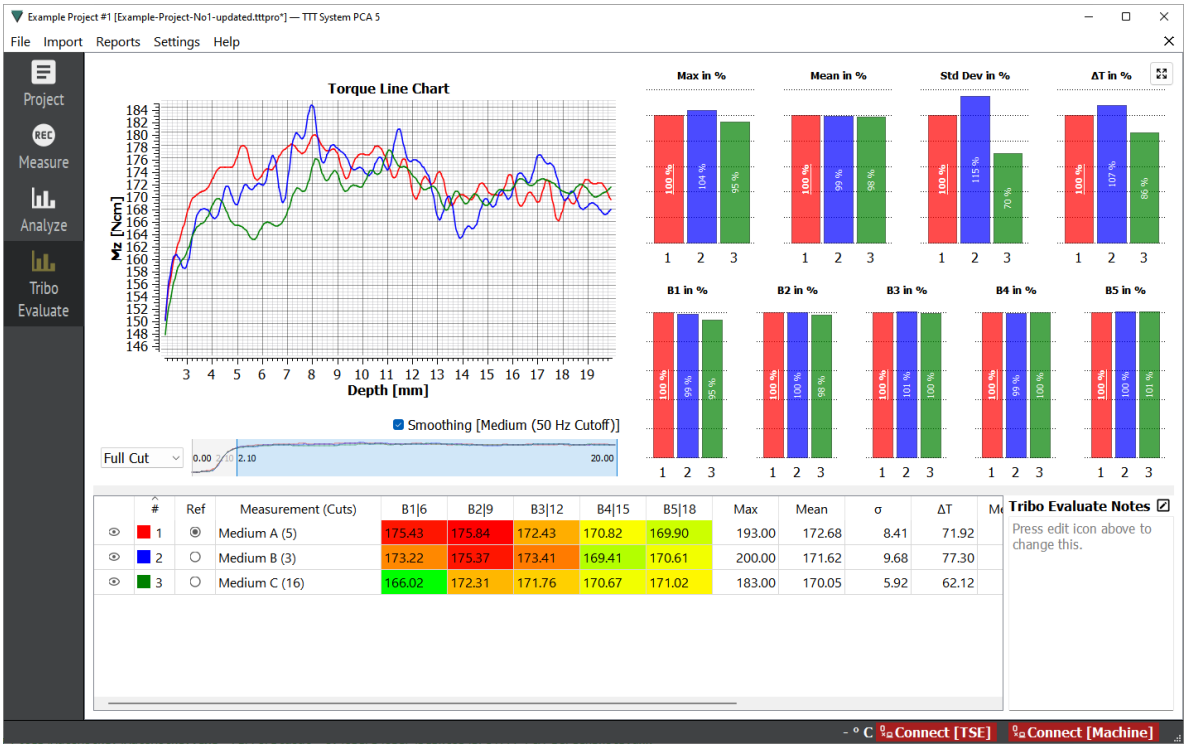
# Further enhancements of the complete rewrite

The TTT-System PCA (formerly WinPCA) version 5 is the successor of version 4, a complete rewrite with massive improvements and additions. The user experience has hugely improved and will improve in the future. With your help we will offer you the analysis tool we all deserve.

## New View: Tribo Evaluate Mode

The major improvement of Version 5 is the new Tribo Evaluate view. This view has an integrated version of the table that includes the Fields of Load for better and easier spotting of the relevant measurements (a series of cuts with the exact same parameters). Torque of several fixed points (depth 6 mm, 9 mm etc.) are visually shown for easier comparison. So it is easy to see which cut performed better in the particular section, even if the absolute torque values are close to each other. **NEW:** The Fields of Load can now be used for 20mm (Lubricant-Industry) and 12mm (Tap-Manufactorer) depth! (Project Settings → Graph and Segments).




| # | Ref | Measurement (Cuts) | B1\|6 | B2\|9 | B3\|12 | B4\|15 | B5\|18 | Max | Mean | σ | ΔT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ◉ | Medium A (5) | 175.43 | 175.84 | 172.43 | 170.82 | 169.90 | 193.00 | 172.68 | 8.41 | 71.92 |
| 2 | ○ | Medium B (3) | 173.22 | 175.37 | 173.41 | 169.41 | 170.61 | 200.00 | 171.62 | 9.68 | 77.30 |
| 3 | ○ | Medium C (16) | 166.02 | 172.31 | 171.76 | 170.67 | 171.02 | 183.00 | 170.05 | 5.92 | 62.12 |

## Tribological Example

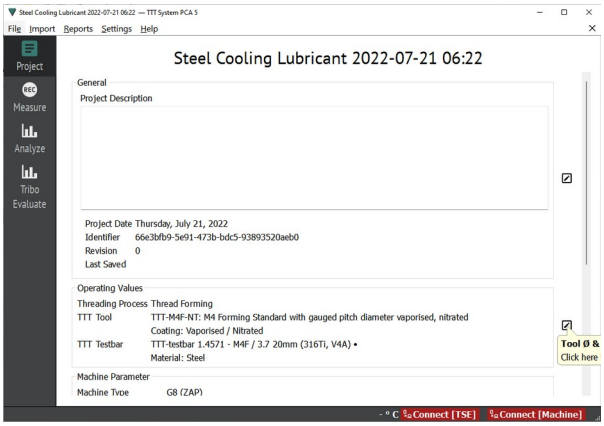
| Measurement | B1 (6mm) | B2 (9mm) | B3 (12mm) | B4 (15mm) | B5 (18mm) |
|---|---|---|---|---|---|
| Medium A | 171.37 | 172.41 | 170.39 | 165.57 | 166.43 |
| Medium B | 177.31 | 178.37 | 174.73 | 174.47 | 173.33 |
| Medium C | 166.02 | 172.31 | 171.76 | 170.67 | 171.02 |

Medium A has a lower torque (Mz) at depths B4 and B5 (see illustration above) than at depths B1 to B3, from which it can be deduced that the medium A has better lubricity (performance) at depths B4, B5 and the resulting higher requirements due to friction and temperature. Medium B shows a similar behavior but overall is worse. Medium C shows a contrary behaviour.

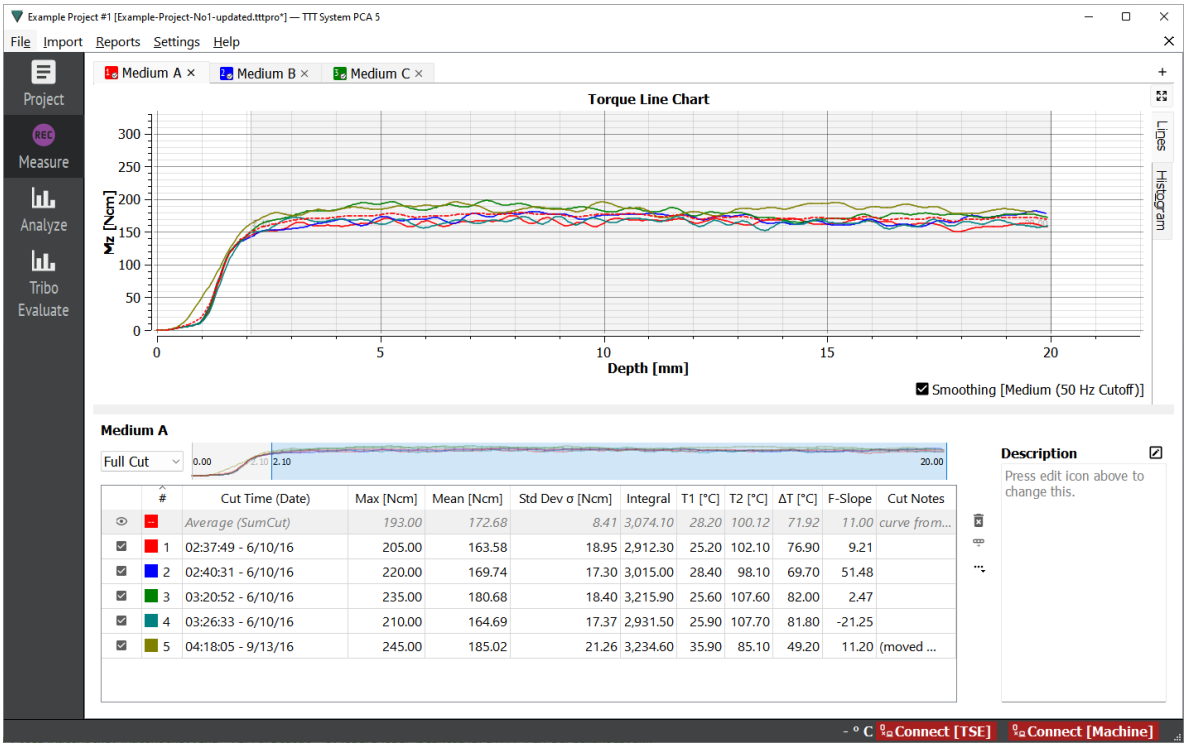
It can be assumed that due to the temperature-dependent effect of additives and so-called EP's, the formulator has a tool at his hands which, according to the "exclusion principle", can be used to proof the efficiency and effectiveness.

## Improved Project-Management

All cuts and SumCuts are contained in a single project file. Integrated TTT-Tool and TTT-Testbar selection as well as starter templates for all TTT-Standard equipment. The templates are equipped with a good and a bad **example measurement series** for quick comparison. It is possible to import all measurement data from the previous WinPCA 3.x.



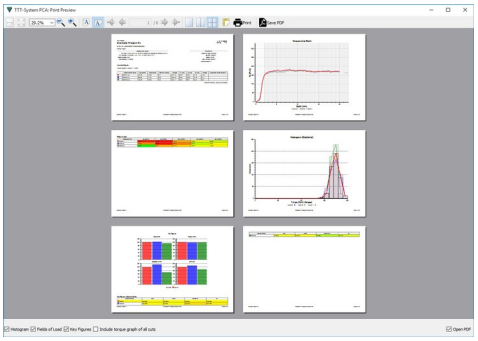

## NEW: Better Management of Measurement-Tabs




The colors marks of the tabs allow now to enable or disable a measurement. This is visually represented by the check mark. The tabs can now also be navigated using your keyboard (CTRL + HOME/END for first, last tab; CTRL + Page Up/Down for +/- 10 Tabs).

## Much improved reporting

Multi page PDF document with sharp (vector based) graphs and detailed tables. The user can add custom formatted text. Via configuration, it is possible to include all line graphs from all cuts. Further you can disable some charts if you don't want them.



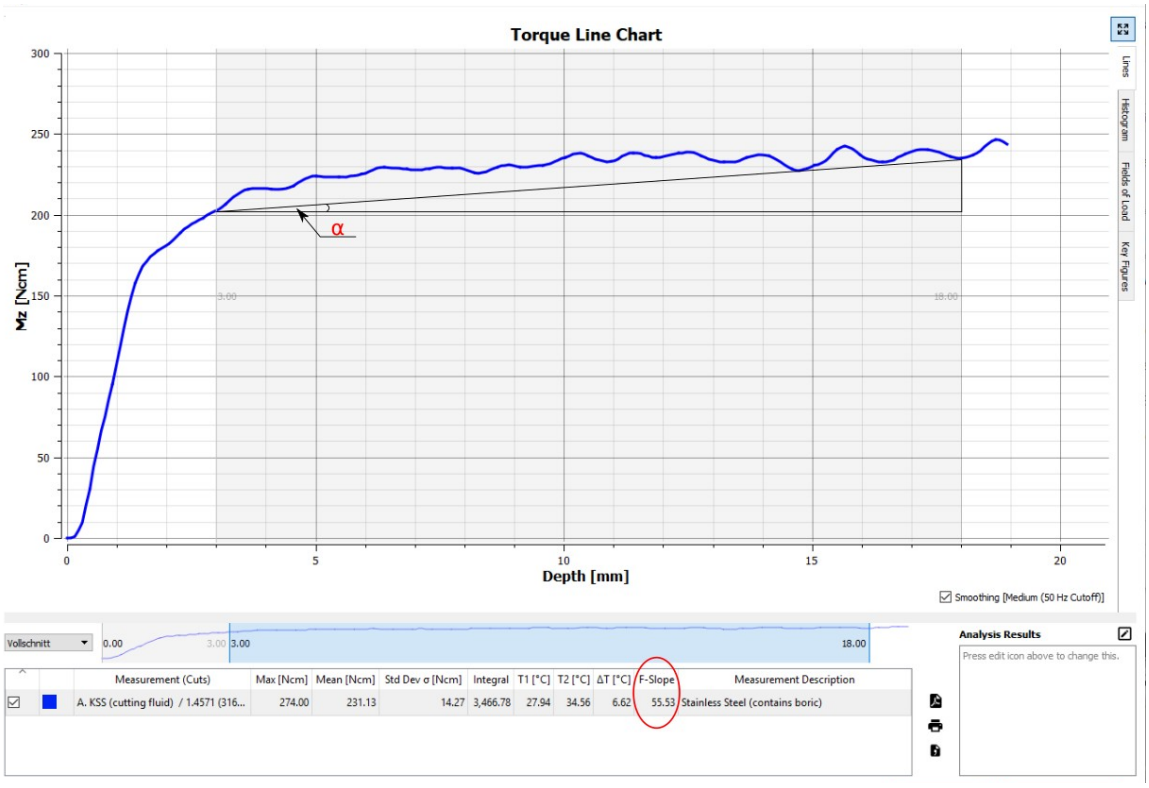
## Data-Export of calculated data (Min/Max/StdDev)

Export the calculated table with Min/Max/StdDev etc. Excel compatible CSV file.

| | Measurement (Cuts) | Max [Ncm] | Mean [Ncm] | Std Dev σ [Ncm] | Integral | T1 [°C] | T2 [°C] | ΔT [°C] | F-Slope | Measurement Description |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | A. KSS (cutting fluid) / 1.4571 (316Ti) | 274.0000 | 231.1250 | 14.2710 | 3466.7800 | 27.9400 | 34.5600 | 6.6200 | 55.5257 | Stainless Steel (contains boric) |
| 1 | B. KSS (cutting fluid) / 1.4571 (316Ti) | 307.0000 | 233.9388 | 24.6630 | 3509.2600 | 28.2000 | 34.3800 | 6.1800 | 60.7361 | Sainless Steel (boric free) |

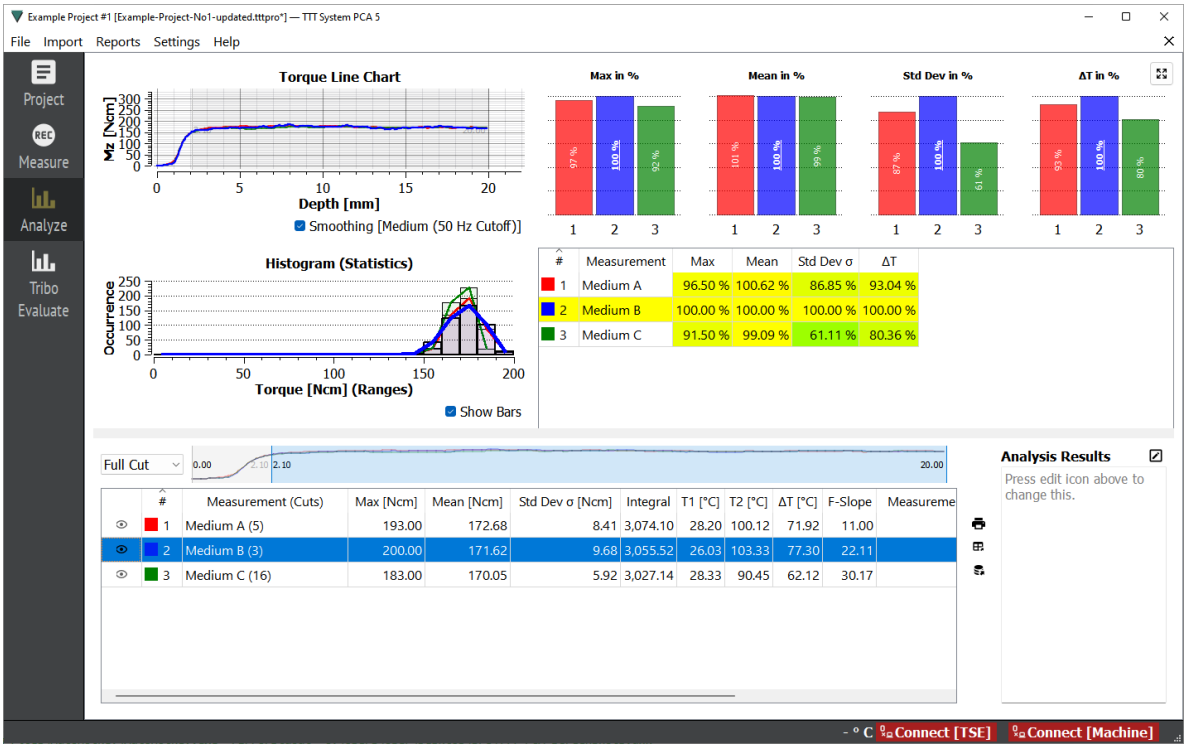
## Key figure: F-Slope

Linear regression of the curve: It is the math. slope of the line between start end end point of the current segment (similar to the old dual cursor). The value is the angle in degrees. The lower, the better.



## Analyze Mode: Automatic always-up-to-date one click *SumCuts*

Analyze the data at any time without the need of loading files manually, the sum of a measurement is build on the fly.




The SumCut values are now visible in the Measure mode already. The dashed line represents the average over all other curves.