AutoEvaluation of DMA Curves: Glass Transitions

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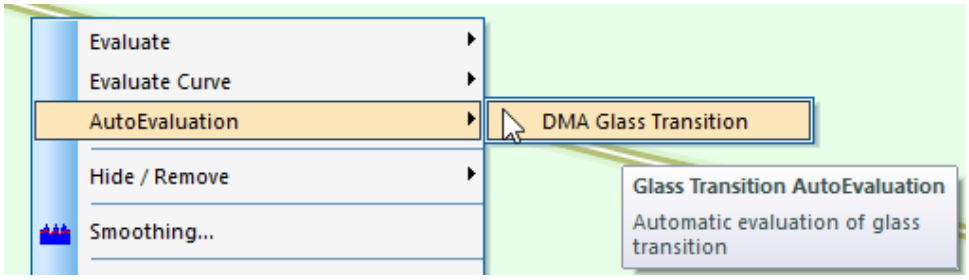
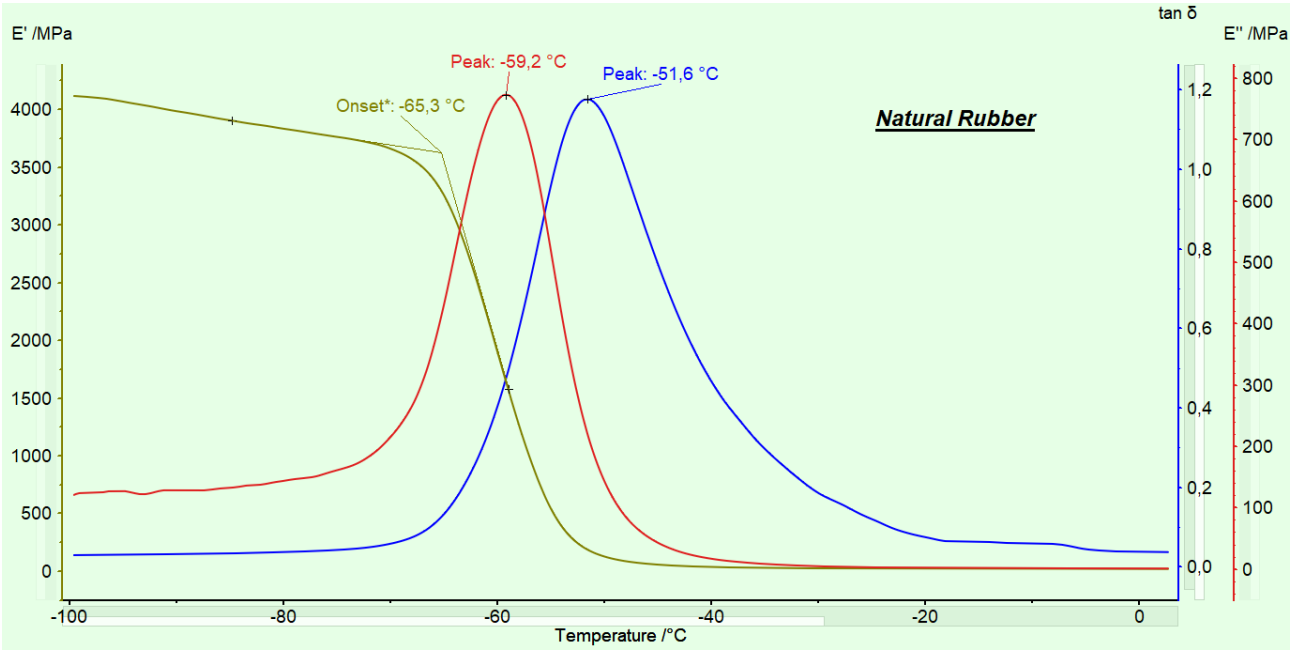
Beginning with Proteus® version 9.2, *AutoEvaluation* is available for the first time for DMA signals. The function "AutoEvaluation DMA Glass Transition" automatically evaluates onsets in E' and |E| as well as peaks in E'' and tan δ, which occur typically during a glass transition. The function can be accessed in *Proteus*® analysis, either via right mouse click on a DMA curve as is shown in figure 1, via the Evaluation menu, or via the corresponding toolbar icon.

Shown in figure 2a are typical results for the *AutoEvaluation* of a measurement on a natural rubber sample, where the onset temperature of the sharp decrease in E' was evaluated automatically at -65°C, as were peak temperatures in E'' and tan δ at -59°C and -52°C. These effects are due to the glass transition. Figure 2b depicts results for the *AutoEvaluation* of a measurement on a PTFE sample illustrating that *AutoEvaluation* is able to find several transitions in one measurement. The example shown in figure 2c, which is a measurement on a polyurethane sample, demonstrates that *AutoEvaluation* can also evaluate onsets in |E|.



1 Accessing "*AutoEvaluation* of DMA curves" via right mouse click on a DMA curve.



2a An example of *AutoEvaluation* results for a DMA measurement on a natural rubber sample.

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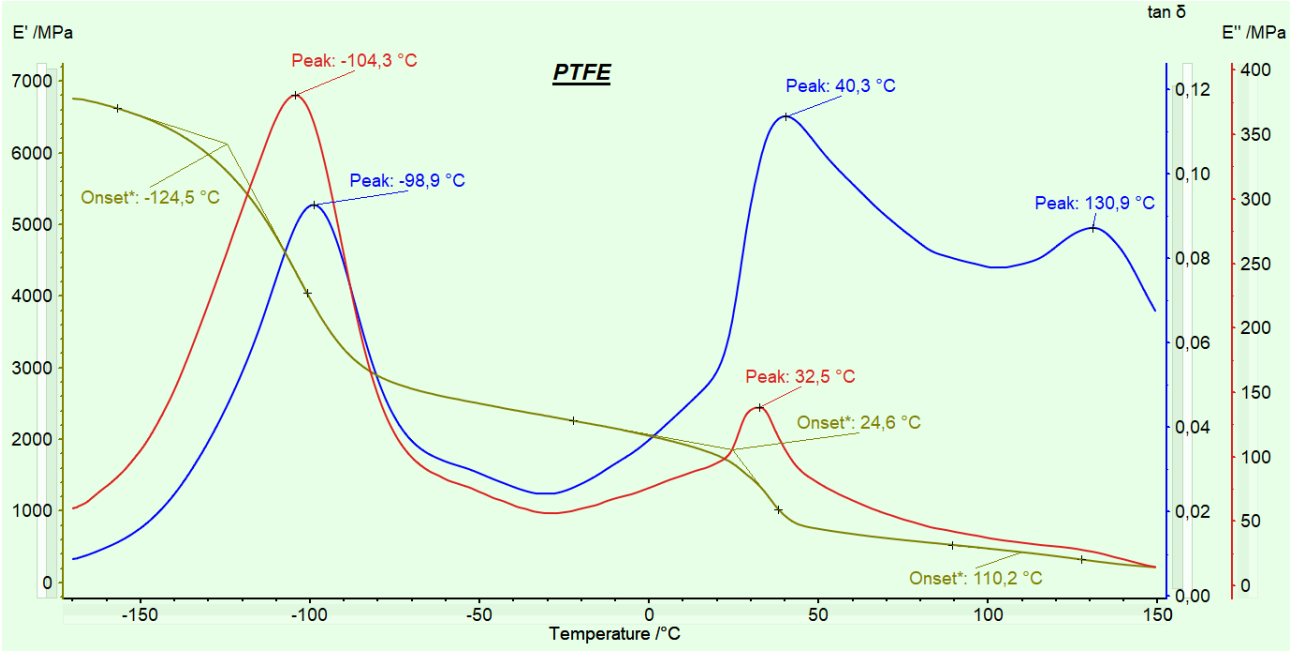
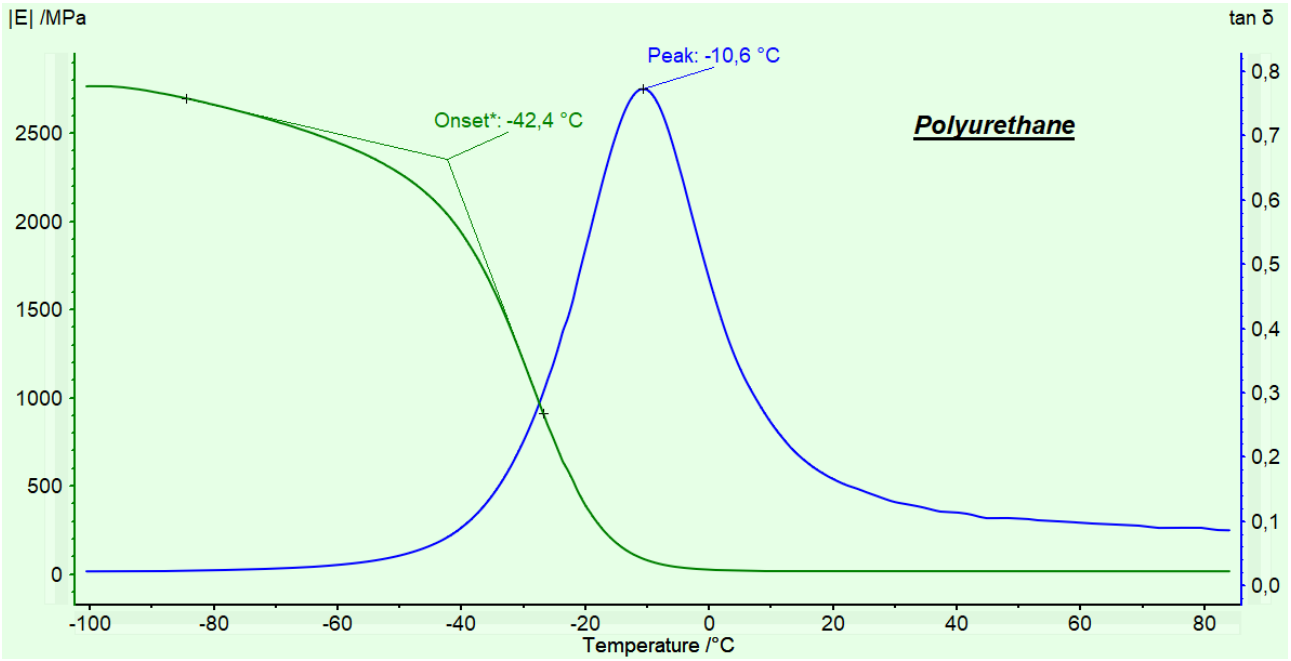


2b An example of *AutoEvaluation* results for a DMA measurement on a PTFE sample.



2c An example of *AutoEvaluation* results for a DMA measurement on a polyurethane sample.

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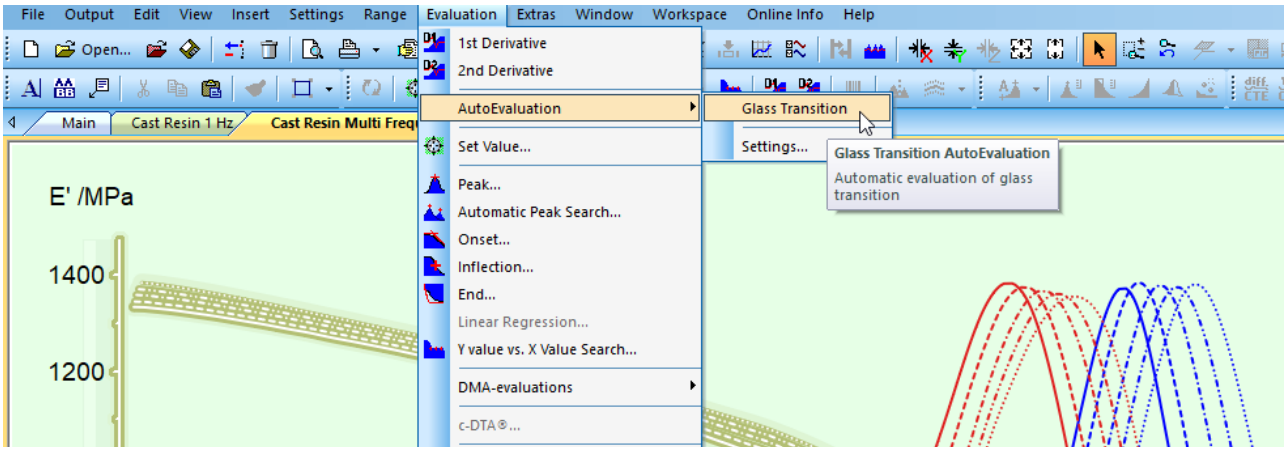
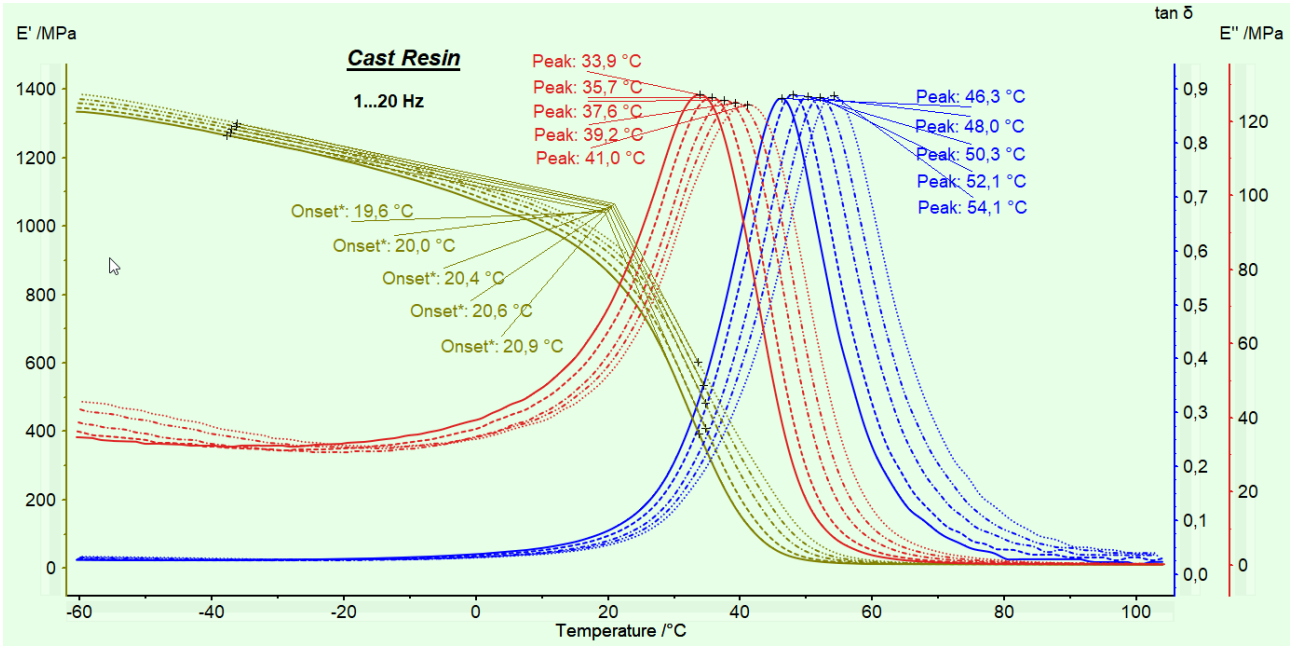
In general, *AutoEvaluation* can even be performed on several measurements at once. First, the y-axis has to be marked, for example for E'; then, from the menu Evaluation/AutoEvaluation, the function "Glass Transition" can be performed (see figure 3a). All DMA curves displayed are then evaluated automatically (see figure 3b).



3a How *AutoEvaluation* can be performed on several measurements at once.



3b An example of *AutoEvaluation* results performed on several measurements at once.

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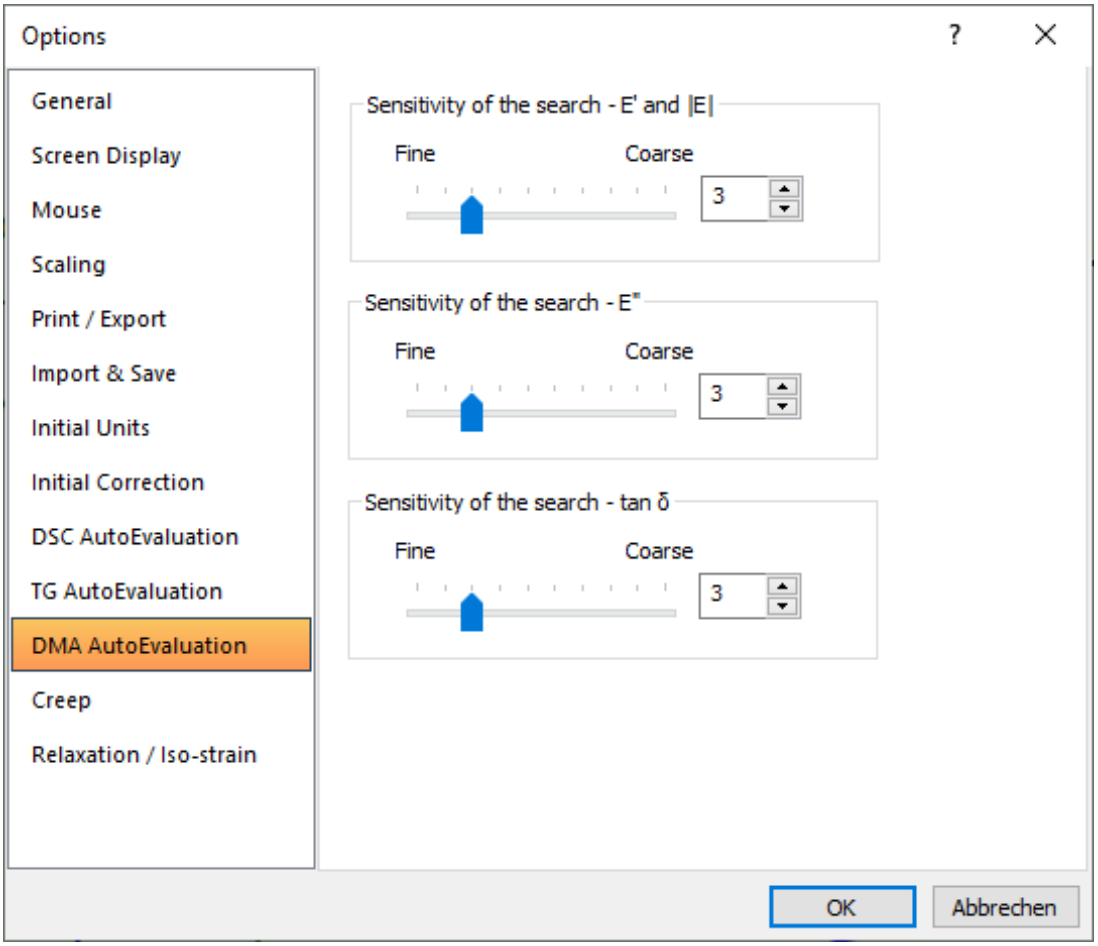
Last but not least, it is furthermore possible to adjust the sensitivity of *AutoEvaluation* via Evaluation/AutoEvaluation Settings (see figure 4): The selection of smaller numbers here yields the evaluation of smaller effects.



4 Adjustment of the sensitivity of *AutoEvaluation*.

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