SOFTWARE INNOVATION

Powerful Data Management with *Proteus® Search Engine*

Dr. Alexander Schindler

Introduction

Do you carry out lots of measurements and create numerous analysis states – maybe even for many different projects? One way or another, quick and selective access to your data is the key to powerful data management. *Proteus® Search Engine* (*PSE)* is a new tool with which to efficiently search for and quickly find your measurements and analysis states in the file system – either locally or in the network.

What Is *Proteus® Search Engine*?

The *PSE* application can be regarded as a special and powerful file explorer for NETZSCH thermal analysis measurements and analysis states. Currently, measurements of type DSC/DTA, TGA, STA, DIL/TMA, DMA and DEA are supported. This tool is available beginning with *Proteus®* 9.0 and is started from the "Assistant" as the central launcher for NETZSCH *Proteus®* applications. As can be seen from the screenshot shown in figure 1, file names are clearly displayed in a list according to directories and filter criteria selected by the user.

1 Typical search result obtained with *Proteus® Search Engine*

NETZSCH-Gerätebau GmbH
Wittelsbacherstraße 42 · 95100 Selb · Germany
Phone: +49 9287/881-0 · Fax: +49 9287/881505
at@netzsch.com · www.netzsch.com

These user-defined properties can be stored as a "search". Users can create custom searches, for example "MyPolymers", "AllMyLocalFiles", "MyProjects_2023", etc., and can switch easily between different existing searches. Files shown can be sorted alphabetically by such categories as file or sample name. Graphs of measurements or analysis states can be displayed as a small preview or – with a single click – enlarged in a separate window. The corresponding folders in the file system, where the selected data is located, can also be opened with a single click. It is also possible to directly open selected files in *Proteus®* analysis via the right mouse button.
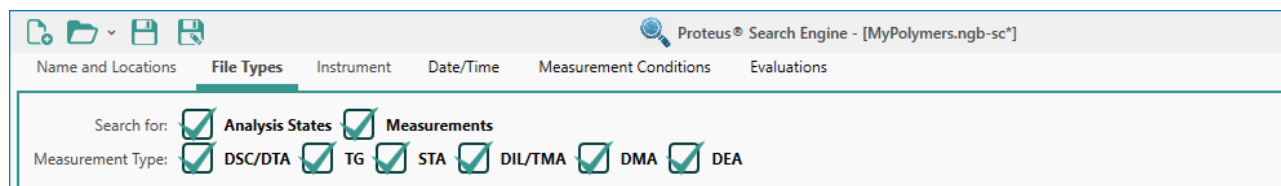
Synchronization Lends Speed

Unlike a conventional file explorer, *PSE* synchronizes with the selected search directories and uses database technology in the background. Once the directories are synchronized, all information required for searching and finding is available in-situ. This allows the search results to be shown immediately – even after switching to a completely different search. Full synchronization of, for example, a new directory can be carried out on demand in the background, and Auto-Synchronization makes sure that any changes such as additional measurements are detected automatically.
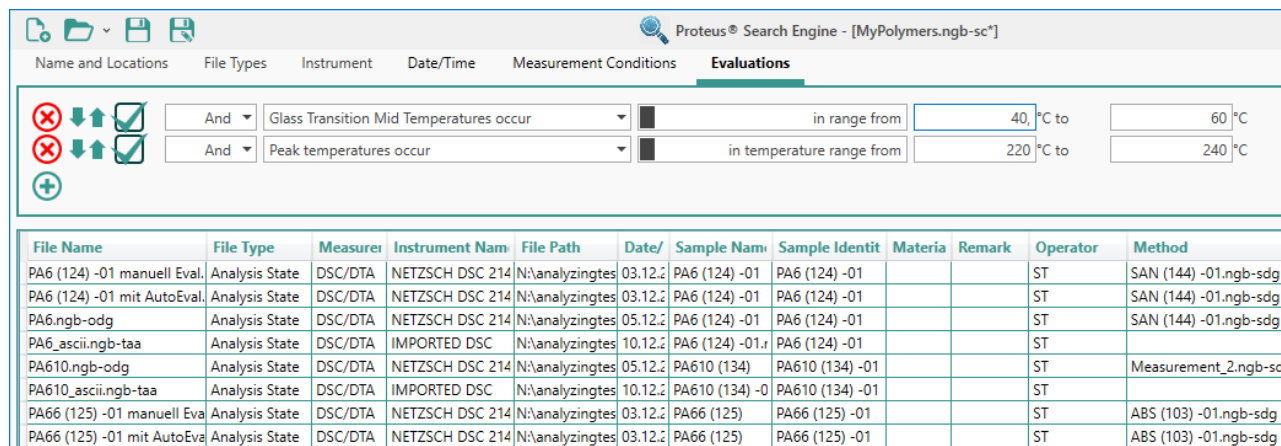
Filtering Lends Power

When working with measurement and evaluation data for different materials and different measurement setups, it is tremendously helpful to be able to sort data by certain filter criteria. Those filter criteria are "strings" (sets of keywords) – for example, in file names, sample names/identity, material, remarks, and operator. The string "PA6" was used for the search shown in figure 1.

But other items can also serve as filter criteria, including file types (see figure 2), instrument names, a range of date and time, and measurement conditions such as heating rate or sample mass.

And filtering according to evaluation results existing in analysis states allows one to search for particular measurements; for example, those originating from a particular material. This can be seen in figure 3, where the occurrence of the glass transition and peak temperatures in certain temperature ranges reveals analysis states with measurements on the polymers PA6, PA610 and PA66 as search results.

2 Filter criteria (here file and measurement types) of *Proteus® Search Engine*

File Name	File Type	Measurer	Instrument Nam	File Path	Date/	Sample Nam	Sample Identit	Materia	Remark	Operator	Method
PA6 (124) -01 manuell Eval.	Analysis State	DSC/DTA	NETZSCH DSC 214	N:\analyzingtes	03.12.2	PA6 (124) -01	PA6 (124) -01			ST	SAN (144) -01.ngb-sdg
PA6 (124) -01 mit AutoEval.	Analysis State	DSC/DTA	NETZSCH DSC 214	N:\analyzingtes	03.12.2	PA6 (124) -01	PA6 (124) -01			ST	SAN (144) -01.ngb-sdg
PA6.ngb-odg	Analysis State	DSC/DTA	NETZSCH DSC 214	N:\analyzingtes	05.12.2	PA6 (124) -01	PA6 (124) -01			ST	SAN (144) -01.ngb-sdg
PA6_ascii.ngb-taa	Analysis State	DSC/DTA	IMPORTED DSC	N:\analyzingtes	10.12.2	PA6 (124) -01.r	PA6 (124) -01			ST	
PA610.ngb-odg	Analysis State	DSC/DTA	NETZSCH DSC 214	N:\analyzingtes	05.12.2	PA610 (134)	PA610 (134) -01			ST	Measurement_2.ngb-sd
PA610_ascii.ngb-taa	Analysis State	DSC/DTA	IMPORTED DSC	N:\analyzingtes	10.12.2	PA610 (134) -0	PA610 (134) -01			ST	
PA66 (125) -01 manuell Eva	Analysis State	DSC/DTA	NETZSCH DSC 214	N:\analyzingtes	03.12.2	PA66 (125)	PA66 (125) -01			ST	ABS (103) -01.ngb-sdg
PA66 (125) -01 mit AutoEva	Analysis State	DSC/DTA	NETZSCH DSC 214	N:\analyzingtes	03.12.2	PA66 (125)	PA66 (125) -01			ST	ABS (103) -01.ngb-sdg

3 Filter criteria (here specific evaluation results) of *Proteus® Search Engine*

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Additional evaluations currently available are endo- and exothermic effects, peak areas and onset temperatures. Users can also define whether evaluations should be outside of defined temperature ranges; such outlier detection can serve as a tool for quality control!

What's the Difference between This and *Identify*?

Both *PSE* and the known Identify database system are tools for the searching and fast finding of measurements. However, whereas *PSE* incorporates only the user's data (found in the file system via synchronization), *Identify* contains user-added data as well as NETZSCH libraries with currently up to 2500 measurements and literature data from various application fields.

Furthermore, only *Identify* offers automatic recognition of new "input" measurement curves. Both applications allow for sophisticated filtering and viewing of the measurement curves, but the overlaying of different curves is only possible in Identify. Another difference between *PSE* and *Identify* is that *PSE* is an independent *Proteus®* application, whereas Identify is incorporated into *Proteus®* analysis.

Finally, it should be noted that for each PC, the installation of a single instrument having the *Protues® Search Engine* option is sufficient in order to fully use all its capabilities for all file types supported. This is the same philosophy as for *Identify*.

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Phone: +49 9287/881-0 · Fax: +49 9287/881505
at@netzsch.com · www.netzsch.com

NETZSCH