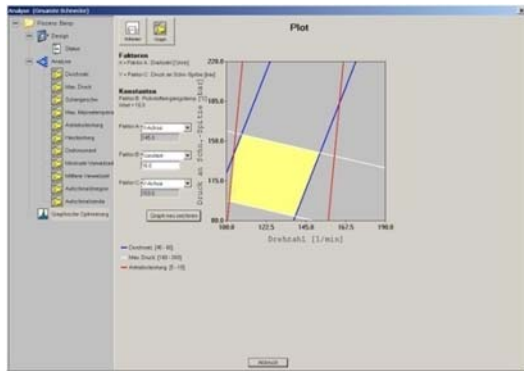


Range of functions and technical details

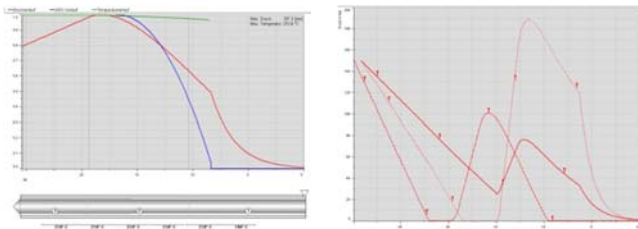
The software features a variety of functions which allow the user to flexibly create the process and to gain absolutely reliable results.

These functions are for example:

- Modular design of the screw from an extensive element-library, including various mixing and shear elements
- Inputting barrier screws
- Flexible design of the heating zones
- Grooved- (axial and spiral) and smooth bushes
- Material administration with own material database PAM
- Variation module
- Scale-Up/ Scale Down function
- Statistical design of experiments
- User-defined functions
- Various reporting options



*Graphical
evaluation of
the calculated
design of
experiment*



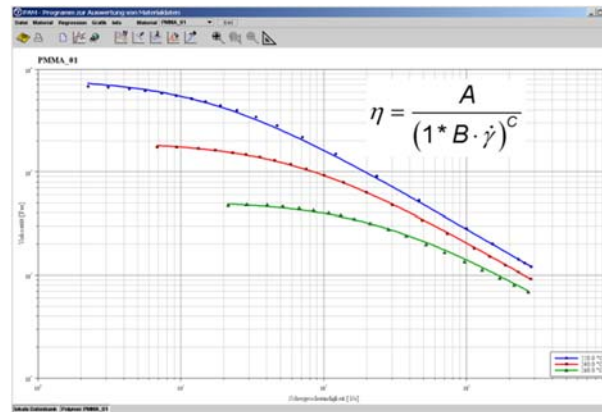
Comparison of the results of various parameters and various screws



The **Paderborn Material database - PAM** - is a software tool used to administer and evaluate material data in the field of polymer engineering. PAM was developed at the professorship for polymer engineering of the University of Paderborn (KTP). With the aid of PAM, the material data is made available for a REX simulation.

Overview of the features in PAM

- Administration of material data
- Import and export of material and mixing data
- Import of measured values or their manual input
- Evaluation of measurement data with various regression functions
- Search for and compare various polymers



Viscosity graph

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Rechnergestützte

Extruderauslegung

Computer Aided Extruder Design



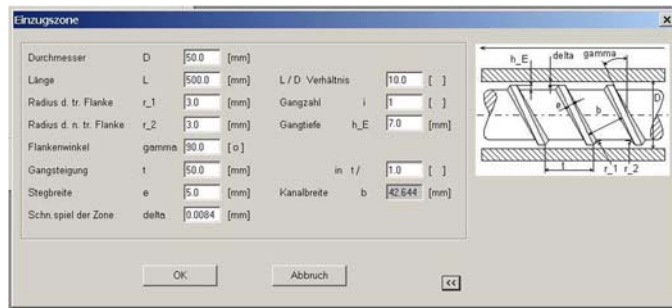
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Please find
further information at
www.KTPweb.de

REX is a joint research project involving various leading industrial companies and the professorship for polymer engineering of the University of Paderborn. Its aim is to develop a software tool which simulates manufacturing processes which use single screw extruders. The simulation's requirements are to rapidly evaluate the machine's global behaviour and to optimise both the barrel and screw configurations as well as the process parameters. This is achieved by primarily implementing analytical and closed form equations. Computer-intensive numerical procedures are mainly omitted.



Graphical user interface

Calculation possibilities

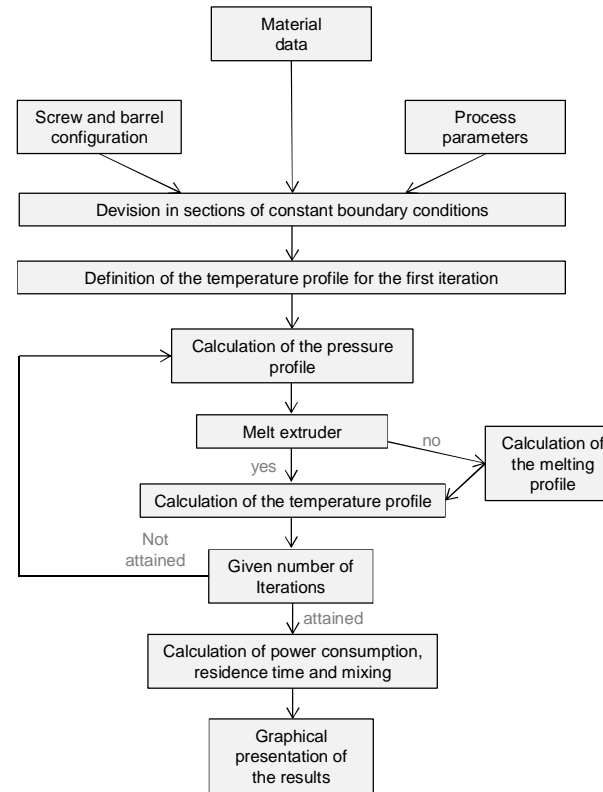
Using REX, the following calculations are currently possible:

- pressure and throughput,
- melting,
- temperature profile,
- power consumption,
- residence times,
- granulate feed behaviour,
- mixing parameter.

In addition to the calculation for "pure" polymers, REX implements models for estimating the behaviour of polymer blends and of polymer-filler-compounds.

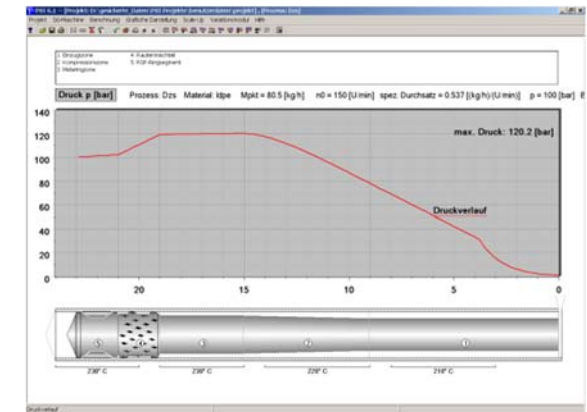
Calculation procedure

The calculation procedure is shown in Figure 2. The central elements of a simulation are the pressure-throughput, the melting and the temperature calculations. Based on these calculations, all other essential parameters can be computed to evaluate and optimise the screw configuration.



Calculation procedure

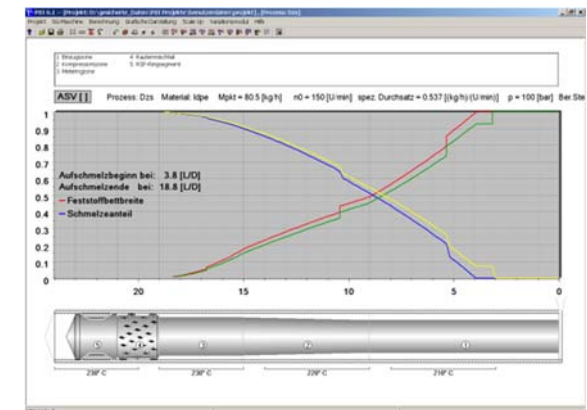
Simulation results



Pressure profile (red) along the screw length

The results of the simulated calculations can be depicted in tables of data as well as graphically in the form of diagrams along the screw length. By plotting the data in this way, it is possible to evaluate the single screw's zones and, if necessary, thereby easily modify the screw design.

To compare and evaluate the effect of various influencing parameters, a so-called variation module is implemented in REX. All variations of the processes can be computed and be subsequently depicted as a multiple graph.



Melting profile (red: solid bed width, blue: melt amount)