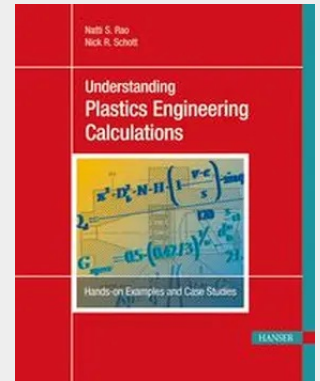


# Understanding Plastics Engineering Calculations

Hands-on Examples and Case Studies

The plastics engineer working on the shop floor in a plastics manufacturing plant often needs quick answers to questions such as why the extruder output is low or whether he can expect better quality product by changing the resin or if the die pressure can be lowered. Applying state-of-the-art numerical software to address these issues is time-consuming and costly. Starting from practical design formulas which are easily applicable, and yet take the resin rheology into account, this guide provides answers to these questions quickly and effectively by guiding the user step by step through the computational procedures on the basis of illustrative technical examples. Problems related to melt fracture, homogeneity of the melt, effect of screw geometry on the quality of the melt and the effect of die pressure on the pellet surface and their troubleshooting are only few of the topics among many that are dealt with in detail. All the calculations involved can be handled by pocket calculators and hence can be performed right on the site where the machines are running. This guide is a valuable tool not only to troubleshoot but also to estimate the effect of design and process parameters on the product quality in plastics processing.

Resin Characterization by power law exponent Effect of shear rate Effect of temperature  
How to calculate power law exponent - Worked-out example Practical screw design  
Output Feed and metering depths Motor power Practical die design Step by step  
calculation of pressure drop in a tube die - Example Pressure drop in a flat die - Example  
Case studies of optimizing dies Pelletizer dies - Example Blow molding dies - Example  
Blown film dies - Example Extrusion coating dies - Example Optimizing melt quality Poor  
melt quality in a coating process - Example Improving melt quality in blown film - Example  
Air bubbles in a flat film - Example



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