Plastic

How can I calculate plastic parts

easy-Button
Material: PA66
Colored
Diameter: 60 mm
Thickness: 2.5 mm
Height: 10 mm
Weight: 27 g
Volume: 12,000 pc/a
Inhalt

How do I calculate plastic parts ........................................................................................................ 2

Start CALC4XL and connect the Database .................................................................................... 2
  Open Excel and start CALC4XL ........................................................................................................ 2
  Connect the Database ....................................................................................................................... 2

Detailed Calculation of a plastic part ................................................................................................ 3
  Project specifications using the example plastic ............................................................................. 3

Section 1 - Section 5 „The Calculation in CBD“ ............................................................................. 5
  Section 1 „Takeover the project specifications“ ............................................................................ 5
  Section 2.1 Raw material ............................................................................................................... 6
  Section 2.4 Production .................................................................................................................... 7
  Supplement: Insert your own machines ......................................................................................... 10
  Section 3 Packaging and Logistik – Insert .................................................................................... 11
  Section 4 Investment and Tooling .................................................................................................. 12
  Section 5 Long term agreement .................................................................................................... 13
  Additional information .................................................................................................................. 13
  Overview and summary sheet ........................................................................................................ 14
  CBD – advantages ......................................................................................................................... 14
How can I calculate plastic parts

Start CALC4XL and connect the Database

Open Excel and start CALC4XL

Select CALC4XL Button

Connect the Database

First connection of a Database

1.: Press the button „link costing DB“

2.: Delivered DB must be stored in a folder

3.: DB select and link by double-clicking
Detailed Calculation of a plastic part

Project specifications using the example plastic

Open the “templates”

4.: Open the „templates“
➔ Cost_Breakdown_(CBD)_for_small_parts_list_1.xlsm

The "Project specification" will open

➢ It opens the „project specification“
➢ First insert or selection of the “Input Overheads”, yellow fields
  o Gemeinkostenfaktoren und Länderdaten sind abhängig von:
    • Country, Industry, Product and Company size
The overhead factors are displayed and can be changed.

- In the example, Development, the supplier delivers parts as drawn, without development → Development is 0%. The changed value appears green.
  - Check the Working system and if need change it.
  - Input General and Calculation Premises
  - Insert a picture and remarks
  - Push the OK Button and it opens the user login.
  - Insert your password and push the OK Button
  - The Cost Break Down (CBD) will open
All data from the project specification are linked and were taken over.

If you want, insert a second picture.
Section 2.1 Raw material

➢ Move cursor to blank field under Materials and double-click
➢ It opens the window „Material Calculation“
➢ Look for Material type and name and number
➢ Choose Material PA66
➢ Insert scrap refund net mass and charge weight
  o In the case of plastics which are produced in the heating channel, the values are usually identical, no losses occur via the sprue
Section 2.4 Production

Cycle time:

- Cursor to blank field under cycle time and double-click
- It opens the process window

The cycle time can be entered directly or can be determined using the cycle time calculator

- Use the cursor to go to the dropdown logic and click on the "C4XL: Injection Molding"
- It opens the Cycle time calculator
- Insert all the white fields and the material group per dropdown, example PA 6
- The graphics of the main process parameters are displayed
- The Parameter max. clamp force will need for the machine selection

**Machine rate per hour:**

<table>
<thead>
<tr>
<th>Sehktion 2.4</th>
<th>Produktion</th>
<th>ME 0.037</th>
<th>DLR 0.148</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Process Benetrieb</td>
<td>Machine</td>
<td>Zylinder (mm)</td>
</tr>
<tr>
<td>1</td>
<td>Spritzgießen</td>
<td>0.36</td>
<td>1</td>
</tr>
</tbody>
</table>

- Click on the blank field under Machine and click
- It opens the template „machine choice. “
- Choise Process group and Machine group.
- Choise Injection molding machine > max. clamping force 203 kN/mm² (calculated in the template Cycle time calculation).
- If need, you can change the Data, otherwise you can insert equipment and consumables on top
- With OK you can insert the hourly rate in the CBD, also you can push the Button „set manually “ and overwrite the numbers.
Operator:

- Click on the blank field under “Operator”
- It opens the Template „wages.“
- Choose the Skill level
- If you want you can change the shift model and the productivity overwrite the button
- Push the OK Button

Set up cost:

- Insert production batch size
- Normal 10 Batch size per year ➔ 12000 pc/a / 10 batches = 1200
➢ Insert Setup time in the field „Std. Capacity Calculation.“

Scrap cost:

➢ Scrap costs are entered as % value for the total process.

Supplement: Insert your own machines

➢ Example Tamponierer
➢ Push in the CBD Section 2.4 the Button under the machine
➢ Choose Process group and machine group
➢ Choose <new machine>

➢ Insert Investment, variable rates, description and machine parameters.
➢ Push the Button „insert as new machine in DB“
Section 3 Packaging and Logistik - Insert

➢ Example not with original data in the CBD.

- Packaging
  - 2 possible packaging types (one-way & returnable)
  - Packing / pallet sizes: 1200x800 pallet, 840 height (excl. Pallet)

- Calculation of "basic price with packaging" optional with "one-way" or "returnable" packaging
Calculation Packaging

\[
\text{Box Cost} + \frac{\text{Other Box Cost}}{\text{Pcs/Box}} + \frac{\text{Pallet Cost}}{\text{Pcs/Pallet}} = \text{Total (one-way)}
\]

Section 4 Investment and Tooling

➢ It is a pure collector, there are no pay-as-you-go or project distributions.

Example Packaging:
9 EUR/Box(20 Pcs/Box*50Uses)+0,5 EUR/Other Box Cost/20Pcs/Box+7EUR/Pallet/(45*20Pcs/Pallet) = 0.0417 EUR/pc
Section 5 Long term agreement

- Input fields are WHITE
- Calculation matrix
- Base price
  - incl. Packaging
  - Incl. Freight
  - Consideration of productivity losses

Annual reduction of the offer price in%.
Savings from the continuous improvement process or a learning curve
Example:
  2 Years 2 % at the 06.06. adjusted
  1 Year 1.5 % adjusted

There is no consideration in the calculation

Additional information

- Pricing Overview
  - Summary in subcategories
  - CBD – Visualization
- Additional tables
  - (E.g. Required capacity for the production volume as a function of the shift model)
Overview and summary sheet

- **Summary of all parts in the file**
  - Column name is equal to the sheet name
  - Total p.A. specifies the total annual cost for each category
  - Summe p.A. addiert die Summe aller Spalten(Teile) welche multipliziert werden mit:
    - Quantity of parts
    - Pieces per year
    - Currency Change
    - Example Euro ➔ Dollar

**CBD - advantages**

- All significant cost information in a file
- Number of lines per category is customizable
- Part mapping facilitates assignment and traceability
- Includes all common cost
- Total sums can be displayed by number (/ pc, / 10, / 100 or, / 1000)
- Variable, supplier specific calculation of surcharges is possible
- Display options for the following cost scenarios
  - 2 different delivery places
  - 2 different packaging options
  - 3 different Incoterms
- **Beside tables as an understanding aid (non-binding)**
  - Calculation machine hourly rate
  - Calculation Machine capacity
  - Detailed packaging & transport options
  - Incl. Terms of Business
  - Complete Cost overview
- **Summary with comparative overview for several parts or cost variants**