Supplementary Material

Supplementary Table 3: Significant effect estimates with 95%- confidence intervals (α =0,05) and adj. correlation coefficients for the four response variables Y1 - Y4.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Factor** | **Y1 - Length of full aluminum head [mm]** | **Y2 -** **Sleeve fracture  [Y/N] = [0,1]** | **|Y3| - Change in copper volume fraction [-]** | **Y4 - Fraction of CCA rod [-]** |
|  | **Effect** | **Conf. Interval** | **Effect** | **Conf. Interval** | **Effect** | **Conf. Interval** | **Effect** | **Conf. Interval** |
| Mean/Intercept | 284,15 | [266,5; 301,8] | 0,620 | [0,49; 0,75] | 0,48 | [0,37; 0,59] | 0,695 | [0,63; 0,76] |
| X1- Extrusion ratio (L) | 224,75 | [195,1; 254,4] |  |  |  |  |  |  |
| X2- Temperature (L) |  |  |  |  |  |  |  |  |
| X3- Ram speed (L) | -33,58 | [-63,26; -3,91] | 0,25 | [-0,026; 0,526] | -0,22 | [-0,46; 0,02] | 0,118 | [0,04; 0,2] |
| X4- Copper volume fraction (L) |  |  | 0,25 | [-0,026; 0,526] | -0,21 | [-0,45; 0,04] | 0,169 | [0,09; 0,25] |
| X5- Die angle 2α (L) | 378,42 | [348,7; 408,1] | -0,75 | [-1,03; -0,47] | 0,62 | [0,38; 0,87] | -0,413 | [-0,5; -0,33] |
| X1X5- interaction x1\*x5 | 128,37 | [92,0; 164,7] |  |  |  |  |  |  |
| X42- Copper vol. fraction (Q) |  |  |  |  |  |  | -0,114 | [-0,19; -0,04] |
| X52- Die angle 2α (Q) | 147,31 | [119,9; 174,7] |  |  |  |  | -0,114 | [-0,19; -0-04] |
| **Adj. Coefficient of****determination R2** | 0,98 |  | 0,56 |  | 0,53 |  | 0,84 |  |