General Linear Model: Bonding versus Temperature, Pressure

Method

|  |  |
| --- | --- |
| Factor coding | (-1, 0, +1) |

Factor Information

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Type | Levels | Values |
| Temperature | Fixed | 3 | HighTemp, LowTemp, MedTemp |
| Pressure | Fixed | 3 | High Pressure, Low Pressure, Med Pressure |

Analysis of Variance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | Adj SS | Adj MS | F-Value | P-Value |
| Temperature | 2 | 23.51 | 11.76 | 0.44 | 0.646 |
| Pressure | 2 | 1034.84 | 517.42 | 19.45 | 0.000 |
| Error | 40 | 1063.96 | 26.60 |  |  |
| Lack-of-Fit | 4 | 139.56 | 34.89 | 1.36 | 0.268 |
| Pure Error | 36 | 924.40 | 25.68 |  |  |
| Total | 44 | 2122.31 |  |  |  |

Model Summary

|  |  |  |  |
| --- | --- | --- | --- |
| S | R-sq | R-sq(adj) | R-sq(pred) |
| 5.15741 | 49.87% | 44.85% | 36.55% |

Coefficients

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Term | Coef | SE Coef | T-Value | P-Value | VIF |
| Constant | 27.644 | 0.769 | 35.96 | 0.000 |  |
| Temperature |  |  |  |  |  |
| HighTemp | 1.02 | 1.09 | 0.94 | 0.353 | 1.33 |
| LowTemp | -0.51 | 1.09 | -0.47 | 0.641 | 1.33 |
| Pressure |  |  |  |  |  |
| High Pressure | 6.62 | 1.09 | 6.09 | 0.000 | 1.33 |
| Low Pressure | -4.58 | 1.09 | -4.21 | 0.000 | 1.33 |

Regression Equation

|  |  |  |
| --- | --- | --- |
| Bonding | = | 27.644 + 1.02 Temperature\_HighTemp - 0.51 Temperature\_LowTemp - 0.51 Temperature\_MedTemp + 6.62 Pressure\_High Pressure - 4.58 Pressure\_Low Pressure - 2.04 Pressure\_Med Pressure |

Fits and Diagnostics for Unusual Observations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Obs | Bonding | Fit | Resid | Std Resid |  |
| 5 | 25.00 | 35.29 | -10.29 | -2.12 | R |
| 21 | 10.00 | 25.09 | -15.09 | -3.10 | R |
| 22 | 15.00 | 25.09 | -10.09 | -2.07 | R |
| 25 | 36.00 | 25.09 | 10.91 | 2.24 | R |

*R  Large residual*