|  |  |  |
| --- | --- | --- |
| **Year** | **Glacial Acrylic Acid - CFR JNPT** | **SAP CIF Price (INR/MT)** |
| FY 2018 | 93326 | 99778 |
| FY 2019 | 95306 | 97408 |
| FY 2020 | 80330 | 97146 |
| FY 2021 | 81912 | 102664 |
| FY 2022 | 147570 | 115761 |
| FY 2023 | 133654 | 121902 |

SUMMARY OUTPUT

|  |  |
| --- | --- |
| *Regression Statistics* | |
| Multiple R | 0.88745 |
| R Square | 0.787567 |
| Adjusted R Square | 0.716756 |
| Standard Error | 5990.164 |
| Observations | 5 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ANOVA | | | | | |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 3.99E+08 | 3.99E+08 | 11.12211 | 0.044554 |
| Residual | 3 | 1.08E+08 | 35882068 |  |  |
| Total | 4 | 5.07E+08 |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 72197.64 | 10766.99 | 6.705461 | 0.006768 | 37932.27 | 106463 | 37932.27 | 106463 |
| 93326 | 0.322758 | 0.09678 | 3.334983 | 0.044554 | 0.014762 | 0.630754 | 0.014762 | 0.630754 |

RESIDUAL OUTPUT

|  |  |  |
| --- | --- | --- |
|  | *Predicted 99778* | *Residuals* |
| 1 | 102958.4 | -5550.44 |
| 2 | 98124.68 | -978.684 |
| 3 | 98635.31 | 4028.694 |
| 4 | 119827 | -4066.01 |
| 5 | 115335.6 | 6566.442 |

PROBABILITY OUTPUT

|  |  |
| --- | --- |
| *Percentile* | *99778* |
| 10 | 97146 |
| 30 | 97408 |
| 50 | 102664 |
| 70 | 115761 |
| 90 | 121902 |

TechSci used various techniques to understand the price trend, correlation and forecast supported with primary interview among key suppliers

**Linear Regression**

* Linear regression is a statistical technique that examines the linear relationship between a dependent variable and one or more independent variables.
* Linear relationship means the change in an independent variable(s) causes a change in the dependent variable.
* Positive Linear Relationship: When the independent variable increases, the dependent variable increases too.
* Negative Linear Relationship: When the independent variable increases, the dependent variable decreases.
* Linear Regression suggested to know the relationship between— Acrylic Acid and Super Absorbent Polymer at 95% confidence level.
* R Square values were positive with a varying degree in all possible propositions, indicating a positive linear relationship but it was not closer to 1. It indicates that there are various factors too which impact more on price.

**Exponential Smoothing (Based on Past Data)**

Exponential smoothing forecasting   is based on the AAA version (additive error, additive trend, and additive seasonality) of the Exponential Triple Smoothing (ETS) algorithm, which smoothest out minor deviations in past data trends by detecting seasonality patterns and confidence intervals.

TechSci used the Exponential Smoothing while considering the price forecast and Primary interviews from the industry shown the confidence on the output

|  |  |  |
| --- | --- | --- |
|  | **SAP CIF Price (INR/MT)** | **Caustic Soda Lye FOB-Qingdao (China)** |
| FY 2018 | 99778 | 10342 |
| FY 2019 | 97408 | 11840 |
| FY 2020 | 97146 | 9040 |
| FY 2021 | 102664 | 6160 |
| FY 2022 | 115761 | 9120 |
| FY 2023 | 121902 | 14960 |

**Summary Output**

|  |  |
| --- | --- |
| *Regression Statistics* | |
| Multiple R | 0.499208 |
| R Square | 0.249208 |
| Adjusted R Square | -0.00106 |
| Standard Error | 11261.28 |
| Observations | 5 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ANOVA | | | | | |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 1.26E+08 | 1.26E+08 | 0.995781 | 0.391876 |
| Residual | 3 | 3.8E+08 | 1.27E+08 |  |  |
| Total | 4 | 5.07E+08 |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 89690.46 | 18039.56 | 4.971876 | 0.015632 | 32280.52 | 147100.4 | 32280.52 | 147100.4 |
| 10342 | 1.690702 | 1.69428 | 0.997888 | 0.391876 | -3.70125 | 7.082656 | -3.70125 | 7.082656 |

**Residual Output**

|  |  |  |
| --- | --- | --- |
| *Observation* | *Predicted 99778* | *Residuals* |
| 1 | 109708.4 | -12300.4 |
| 2 | 104974.4 | -7828.41 |
| 3 | 100105.2 | 2558.813 |
| 4 | 105109.7 | 10651.33 |
| 5 | 114983.4 | 6918.636 |

**Probability Output**

|  |  |
| --- | --- |
| *Percentile* | *99778* |
| 10 | 97146 |
| 30 | 97408 |
| 50 | 102664 |
| 70 | 115761 |
| 90 | 121902 |

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