Estimation for Difference

|  |  |  |
| --- | --- | --- |
| Difference | CI for Difference | Achieved Confidence |
| -4 | (-8, 0.0000000) | 95.48% |

Test

|  |  |
| --- | --- |
| Null hypothesis | H₀: η₁ - η₂ = 0 |
| Alternative hypothesis | H₁: η₁ - η₂ ≠ 0 |

|  |  |  |
| --- | --- | --- |
| Method | W-Value | P-Value |
| Not adjusted for ties | 77.00 | 0.038 |
| Adjusted for ties | 77.00 | 0.037 |

Boxplot of Unit 1, Unit 2



Descriptive Statistics: Unit 1, Unit 2

Statistics

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | Mean | Minimum | Q1 | Median | Q3 | Maximum |
| Unit 1 | 29.50 | 24.00 | 25.75 | 29.50 | 32.25 | 38.00 |
| Unit 2 | 33.400 | 29.000 | 30.750 | 33.500 | 35.500 | 38.000 |

Conclusion:

1. The Mann-Whitney test shows that the p-value (0.038) is smaller than the significance probability (0.05). we reject the null hypothesis at 5% level of significance. Hence, the median heat gain after 15 mins of operation of two different units are not same.
2. The median heat gain of unit (29.50) is significantly lower than the median heat gain of unit 2(33.50). It shows the quality of unit 2 is better than the unit 1, because average temperature reached after 15 minutes of operation is higher in unit 2 type cell.
3. The box and whisker plot shows that the heat gain of unit 1 is highly variable while the heat gain of unit 2 is less variable.
4. The distribution of heat gain of unit 1 is slightly right skewed while the distribution of heat gain of unit 2 is almost symmetrical.
5. So considering median temperature reached after 15 minutes of operation, variation and shape of the distribution, unit 2 I superior than the unit 1. So, manufacture is advised to purchase unit 2 heating elements for manufacturing bath tub.