Predictive Maintenance & Failure Analytics Dashboard

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Failure Rate (%)
3.39%
0% — 100%
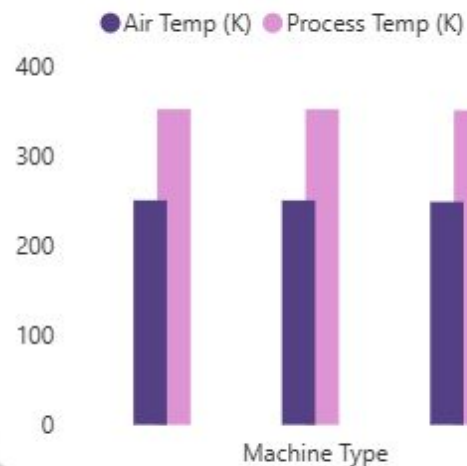
Rotational Speed (rpm)
1265
0 — 2529

Total Records
10K

Avg Torque (Nm)
39.99 Nm

Temperature Distribution
- Air Temp (K)
- Process Temp (K)

400
300
200
100
0

Machine Type

Machine Performance Summary
600
400
200
0

Medium loads   lighter loads   Heavy loads

Avg Tool Wear (Hrs) by Machine Type
3.57
3.54
3.53

Medium loads   Heavy loads   lighter loads
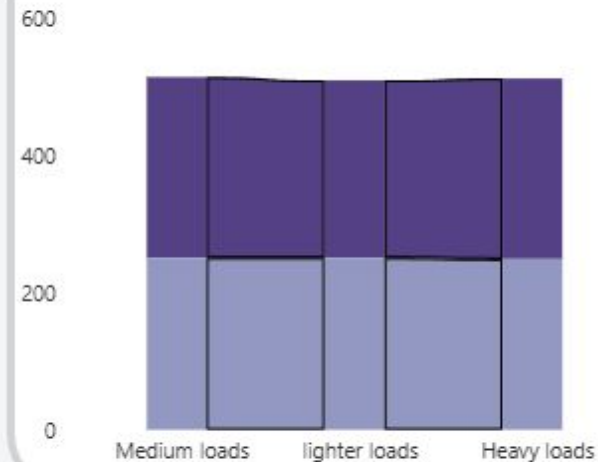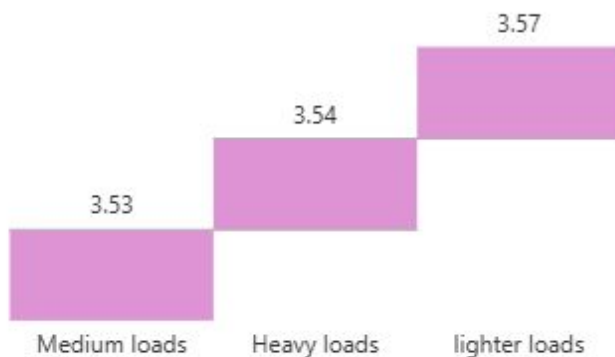
Torque vs Process Temperature
45
40
35
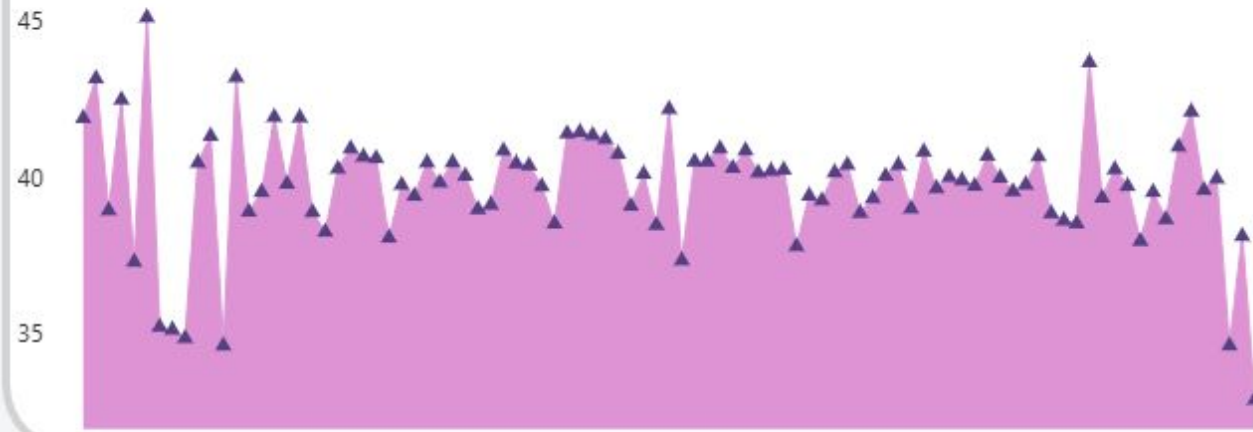
Dashboard 1: Summary

- **Dashboard Summary –** This interactive Power BI dashboard provides a comprehensive overview of machine performance and failure analytics. It supports maintenance teams and operations managers in monitoring key operational metrics, identifying machine behavior patterns, and predicting potential failures to optimize performance and reduce downtime.

Key Metrics Displayed

- **Failure Rate (%):** 3.39% – Represents the proportion of machines experiencing failures.
- **Rotational Speed (rpm):** 1,265 – Average operating speed of machines.
- **Total Records:** 10K – Indicates the volume of machine data records analyzed.
- **Avg Torque (Nm):** 39.99 Nm – Average torque applied across all machines.

- **Filters Available**
  – Interactive slicers for Date, Product ID, and Distributor ID and also added button slicer for Regions to allow tailored analysis.
- **Drill–Through Analysis**
  – A detailed drill-through table has been added to this dashboard to provide insights, supporting deeper analysis of Sales Units.

Dashboard 1: Summary

Core Visual Insights

- **Temperature Distribution by Machine Type**:
  - Displays side-by-side comparison of Air Temperature and Process Temperature across machine load types.
  - Process temperature is consistently higher, suggesting thermal stress under load.
- **Machine Performance Summary**:
  - Stacked bar chart compares failure and non-failure occurrences across Medium, Lighter, and Heavy load machine types.
  - Performance appears evenly distributed but can help isolate high-risk load segments.
- **Avg Tool Wear (Hrs) by Machine Type**:
  - Average tool wear is nearly the same across types: Medium loads: 3.53 hrs, Heavy loads: 3.54 hrs, Lighter loads: 3.57 hrs
  - Lighter loads show slightly higher wear, indicating possible underperformance or overuse.
- **Torque vs Process Temperature**:
  - Area + line chart showing torque values against corresponding process temperatures.
  - Useful to identify anomalies or correlations between thermal buildup and applied torque.