**Cluster Analysis**

| Initial Cluster Centers | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Products** | **Component Manufacturers** | **Design and Component Manufacturers** | **MRO** | **Design** | **Component Manufacturers & MRO** | **Design, Component Manufacturing and MRO** | **Design and MRO** |
| **3D Laser and Measurement** | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Aerospace Extrusions** | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| **Antennas** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Assembly and Overhaul** | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| **Cables** | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| **Construction Material** | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Fasteners** | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **Handheld Gauges** | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **High Precision Activators** | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **Hydraulics** | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| **Machine Tools** | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **Manufacturing and Embedded Systems** | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Metal Heat Treatment** | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **Metals and Plastics** | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| **Microwave Components** | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Milling** | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| **Missile Systems** | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| **Power Chords** | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Precision Measurement and Process Control** | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| **Safety and Material Handling** | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| **Screened Cables** | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sensors for Space Applications** | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Standard and Specific Solutions** | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Tools and Equipment** | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **Turning** | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| **Turnmill** | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| **Welding and Abrasive** | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| **Other** | 0 | 0 | 0 | 0 | 1 | 1 | 0 |

This matrix represents an initial assignment of items to clusters. Depending on the context and purpose of this clustering, further analysis and refinement of clusters may be necessary. It's common to use clustering algorithms to determine these assignments automatically based on certain criteria or distance measures between items.

**Final Cluster Centers**

| | Component Manufacturers | Design and Component Manufacturers | MRO | Design | Component Manufacturers & MRO | Design, Component Manufacturing and MRO | Design and MRO |
|---|---|---|---|---|---|---|---|
| **3D Laser and Measurement** | 0.08 | 0 | 0 | 0.09 | 0.03 | 0 | 0 |
| **Aerospace Extrusions** | 0.02 | 0.05 | 0 | 0.47 | 0 | 0 | 0.35 |
| **Antennas** | 0 | 0 | 0 | 0.09 | 0 | 0 | 0 |
| **Assembly and Overhaul** | 0.12 | 0.33 | 0.4 | 0 | 0.03 | 1 | 0.95 |
| **Cables** | 0 | 0.1 | 0 | 0.13 | 0.02 | 1 | 0.8 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Construction Material** | 0 | 0 | 0.08 | 0 | 0 | 0 | 0 |
| **Fasteners** | 0 | 0 | 0.02 | 0 | 0.05 | 1 | 0.4 |
| **Handheld Gauges** | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| **High Precision Activators** | 0.08 | 0.05 | 0.08 | 0 | 0.04 | 0 | 0.15 |
| **Hydraulics** | 0.02 | 0.1 | 0 | 0 | 0.04 | 0 | 0.05 |
| **Machine Tools** | 0 | 0 | 0.79 | 0 | 0.02 | 0.8 | 0 |
| **Manufacturing and Embedded Systems** | 0.02 | 0 | 0 | 0.09 | 0.05 | 0 | 0 |
| **Metal Heat Treatment** | 0 | 0.86 | 0.06 | 0 | 0.01 | 0 | 0 |
| **Metals and Plastics** | 0.06 | 0.9 | 0.25 | 0 | 0.15 | 1 | 0 |
| **Microwave Components** | 0.06 | 0 | 0 | 0 | 0.03 | 0 | 0.6 |
| **Milling** | 0.14 | 0.24 | 0.06 | 0.03 | 0.02 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Missile Systems** | 0 | 0 | 0 | 0 | 0.01 | 0 | 0 |
| **Power Chords** | 0 | 0 | 0.08 | 0 | 0.01 | 0.8 | 0.05 |
| **Precision Measurement and Process Control** | 0.77 | 0.1 | 0.08 | 0 | 0 | 0.2 | 0.2 |
| **Safety and Material Handling** | 0.02 | 0 | 0 | 0 | 0.01 | 0.2 | 0 |
| **Screened Cables** | 0 | 0 | 0.08 | 0 | 0 | 0 | 0 |
| **Sensors for Space Applications** | 0 | 0 | 0 | 0.97 | 0 | 0 | 0.1 |
| **Standard and Specific Solutions** | 0.02 | 0 | 0 | 0 | 0.01 | 0 | 0 |
| **Tools and Equipment** | 0.45 | 0.48 | 0.09 | 0 | 0.06 | 0 | 0 |
| **Turning** | 0.12 | 0.05 | 0.21 | 0.03 | 0.04 | 0.2 | 0 |
| **Turnmill** | 0 | 0 | 0 | 0.03 | 0.01 | 0 | 0 |
| **Welding and Abrasive** | 0.06 | 0.43 | 0 | 0 | 0.06 | 0.2 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Other** | 0.12 | 0.24 | 0 | 0.03 | 0.48 | 0.2 | 0 |

- "9A" is primarily associated with the "Design" cluster, with a membership score of 0.09. There is also a minor association with the "Component Manufacturers" cluster (0.08).
- "9B" is predominantly associated with the "Design" cluster (0.47) and the "Design and MRO" cluster (0.35). It also has smaller associations with the "Design and Component Manufacturers" cluster (0.05) and the "Component Manufacturers" cluster (0.02).
- "9C" is primarily associated with the "Design" cluster (0.09).
- "9D" has strong associations with several clusters, including "Component Manufacturers" (0.12), "Design and Component Manufacturers" (0.33), "MRO" (0.4), "Component Manufacturers & MRO" (0.03), "Design, Component Manufacturing and MRO" (1), and "Design and MRO" (0.95).
- "9E" is primarily associated with the "Design, Component Manufacturing and MRO" cluster (1) and also has associations with the "Design" (0.13) and "Design and MRO" (0.8) clusters.
- "9F" is primarily associated with the "MRO" cluster (0.08).
- "9G" is associated with the "Design and MRO" cluster (1) and also has minor associations with the "MRO" (0.02) and "Component Manufacturers" (0.05) clusters.
- "9H" is primarily associated with the "Design and MRO" cluster (1).
- "9I" has associations with several clusters, including "Component Manufacturers" (0.08), "Design" (0.08), "Design and MRO" (0.15), and "Component Manufacturers & MRO" (0.04).
- "9J" has associations with the "Design and Component Manufacturers" (0.1) and "Design" (0.02) clusters.
- "9K" is primarily associated with the "Component Manufacturers & MRO" (0.8) and "MRO" (0.79) clusters.
- "9L" has associations with the "Design" (0.09) and "Component Manufacturers" (0.05) clusters.
- "9M" is primarily associated with the "Design and Component Manufacturers" cluster (0.86) and has minor associations with the "Design" (0.06) and "MRO" (0.01) clusters.
- "9N" is associated with several clusters, including "Design and Component Manufacturers" (0.9), "Component Manufacturers" (0.06), "MRO" (0.25), and "Design, Component Manufacturing and MRO" (0.15).
- "PO" is primarily associated with the "Design and MRO" cluster (0.6) and also has associations with the "Design" (0.03) and "Component Manufacturers" (0.06) clusters.
- "9P" has associations with several clusters, including "Design" (0.47), "Component Manufacturers" (0.14), "Design and Component Manufacturers" (0.24), "MRO" (0.06), and "Component Manufacturers & MRO" (0.03).
- "9Q" is primarily associated with the "Design and Component Manufacturers" cluster (0.01).
- "9R" has associations with the "Design and MRO" (0.8) and "Design" (0.08) clusters.
- "9S" is primarily associated with the "Component Manufacturers" (0.77) and "Design, Component Manufacturing and MRO" (0.2) clusters. It also has associations with the "Design" (0.08) and "Design and MRO" (0.2) clusters.
- "9T" has associations with the "Component Manufacturers" (0.02), "Design" (0.01), and "Design and MRO" (0.2) clusters.
- "9U" is primarily associated with the "MRO" (0.08) cluster.
- "9V" is primarily associated with the "Design" cluster (0.97).
- "9W" has associations with the "Design" (0.02) and "Design and MRO" (0.01) clusters.

- "9X" is associated with several clusters, including "Design and Component Manufacturers" (0.48), "Component Manufacturers" (0.45), "MRO" (0.09), and "Component Manufacturers & MRO" (0.06).
- "9Y" has associations with multiple clusters, including "Design, Component Manufacturing and MRO" (0.2), "MRO" (0.21), "Design" (0.12), "Design and MRO" (0.2), and "Component Manufacturers" (0.05).
- "9Z" is primarily associated with the "MRO" (0.03) cluster.
- "9AA" has associations with several clusters, including "Design and Component Manufacturers" (0.43), "Component Manufacturers" (0.06), "Design, Component Manufacturing and MRO" (0.2), and "Component Manufacturers & MRO" (0.06).
- "9AB" has associations with several clusters, including "Design and Component Manufacturers" (0.24), "Component Manufacturers" (0.12), "Design" (0.03), "MRO" (0.48), and "Design, Component Manufacturing and MRO" (0.2).

These cluster center values represent the strength of association or membership of each item with different clusters. Depending on the context and purpose of the analysis, these cluster assignments can be used for various applications, such as customer segmentation, product categorization, or pattern recognition.

| **Number of Companies in each Cluster** | |
|---|---|
| **Cluster** | **No. of Companies** |
| 1 | 66 |
| 2 | 21 |
| 3 | 53 |
| 4 | 32 |
| 5 | 177 |
| 6 | 5 |
| 7 | 20 |
| **Total** | **374** |

The table shows the number of companies assigned to each cluster in a clustering analysis. Each cluster is labeled from 1 to 7, and the table also includes a "Total" row indicating the total number of companies in all clusters, which is 374.

**Here's the interpretation of the data:**

Cluster 1 contains 66 companies.

Cluster 2 contains 21 companies.

Cluster 3 contains 53 companies.

Cluster 4 contains 32 companies.

Cluster 5 contains 177 companies.

Cluster 6 contains 5 companies.

Cluster 7 contains 20 companies.

In total, there are 374 companies that have been assigned to these seven clusters.

Clustering analysis is a technique used to group similar entities (in this case, companies) together based on certain characteristics or features. These clusters can help in various applications such as customer segmentation, market analysis, and pattern recognition. The number of companies in each cluster provides insights into how companies are distributed across different groups based on the criteria used in the clustering algorithm. For example, Cluster 5 is the largest cluster with 177 companies, while Cluster 6 is the smallest with only 5 companies. These cluster assignments can be further analyzed to understand the characteristics or behaviors that distinguish companies within each cluster.