**\**

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Experiment 6: Machining

* Based on the **turning** experiments carried out, fill in the following table\*:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test No. |  |  |  |  |  |  |  |  |  |
| 1 | 18 mm | 38 mm | 1.5 | 36.5 | 0.466 | 585 | 272.61 | 0.073365 | 46889.52 |
| 2 | 18 mm | 38 mm | 3 | 35 | 0.466 | 585 | 272.61 | 0.073365 | 89925.11 |
| 3 | 18 mm | 38 mm | 1.5 | 36.5 | 0.606 | 585 | 354.51 | 0.056416 | 60976.5 |
| 4 | 18 mm | 38 mm | 1.5 | 36.5 | 0.466 | 900 | 419.4 | 0.047687 | 72137.72 |

Using the stylus profilometry measure the roughness of each surface after machining:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test No. |  |  |  |  |  |
| 1 | 0.466 | 1 | 585 | 5.62 | 30.1 |
| 2 | 0.466 | 2 | 585 | 7.99 | 36.2 |
| 3 | 0.606 | 1 | 585 | 6.67 | 51.3 |
| 4 | 0.466 | 1 | 900 | 4.15 | 24.3 |

* Discuss the effects of turning cutting parameters on the surface finish of the work piece. Describe the chips formed by turning process.

-The surface finish worsens as the depth of cut and feed increase but becomes better as rotational speed increases.

-The chips formed by the turning process could be continuous or discontinuous.

Based on the milling experiments carried out, fill in the following table:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Test No. |  |  |  |  |  |  |  |  |  |
| 1 | 10mm | 1 | 40 mm | 4 | 0.0171875 | 640 | 44 | 0.90901 | 440 |
| 2 | 10mm | 2 | 40 mm | 4 | 0.0171875 | 640 | 44 | 0.90901 | 880 |
| 3 | 10mm | 1 | 40 mm | 4 | 0.03203125 | 640 | 82 | 0.4878 | 820 |
| 4 | 10mm | 1 | 40 mm | 4 | 0.0205 | 1000 | 82 | 0.4878 | 820 |

* Using the stylus profilometry measure the roughness of each surface after machining:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test No. |  |  |  |  |  |
| 1 | 0.0171875 | 1 | 640 | 3.22 | 10.6 |
| 2 | 0.0171875 | 2 | 640 | 4.56 | 17.7 |
| 3 | 0.03203125 | 1 | 640 | 3.53 | 13.5 |
| 4 | 0.0205 | 1 | 1000 | 1.53 | 11 |

* Discuss the effects of milling cutting parameters on the surface finish of the workpiece.

-the data in these experiments is harder to judge due to the feed changing on each test but as in the turning experiments the surface finish is worse the higher the depth of cut and the feed are, but better the higher the rotational speed is

* Describe the chips formed by milling process. Why are they on this form?

-They are discontinuous due to multiple cutting edges.