

NATIONAL INSTITUTE OF TECHNOLOGY DURGAPUR

DEPARTMENT OF Metallurgical & Materials Engineering

REPORT

TITLE Pin-on-disk wear behaviour
study at 20N load

Name Deep Narayan
Semester 7th Roll No. 20MM8051
Section - Year 4th (2023)
Signature Deep*
Date of Experiment 7/8/2023

Experiment - 1

① *

Title:

→ Pin-on-disk wear behaviour study at 20N load

① *

Aim:

→ To study pin-on-disk wear behaviour at 20N load, calculate the wear rate and plot cumulative wear vs sliding distance and coefficient of friction vs sliding distance graphs

① *

Theory:

→ As discussed in Experiment - 3

① *

Procedure:

→ As discussed in Experiment - 3

① *

Observation:

→ P.T.O.: →

NATIONAL INSTITUTE OF TECHNOLOGY DURGAPUR

DEPARTMENT OF Metallurgical & Materials Engineering PAGE NO II

Title:

Pin-on-disk wear behaviour study at 20N

Observation:

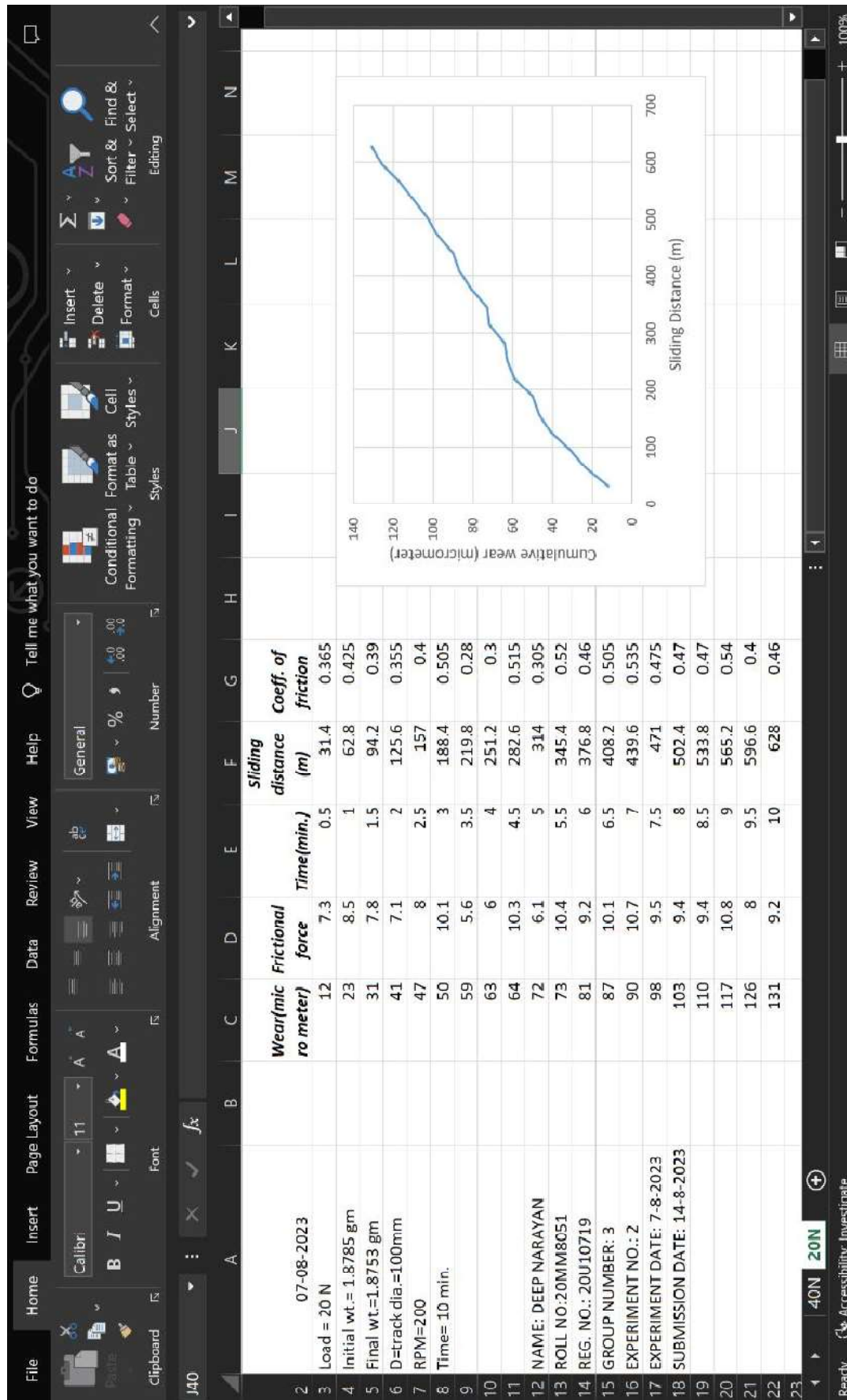
| Sl. No. | Wear (micro meter) | Frictional Force (N) | Time (min) | Sliding distance (m) | Coeff. of friction |
|---------|-----------------------|-------------------------|------------|-------------------------|-----------------------|
| 1 | 12 | 7.3 | 0.5 | 31.4 | 0.365 |
| 2 | 23 | 8.5 | 1 | 62.8 | 0.425 |
| 3 | 31 | 7.8 | 1.5 | 94.2 | 0.39 |
| 4 | 41 | 7.1 | 2 | 125.6 | 0.355 |
| 5 | 47 | 8 | 2.5 | 157 | 0.4 |
| 6 | 50 | 10.1 | 3 | 188.4 | 0.505 |
| 7 | 59 | 5.6 | 3.5 | 219.8 | 0.28 |
| 8 | 63 | 6 | 4 | 251.2 | 0.3 |
| 9 | 64 | 10.3 | 4.5 | 282.6 | 0.515 |
| 10 | 72 | 6.1 | 5 | 314 | 0.305 |
| 11 | 73 | 10.4 | 5.5 | 345.4 | 0.52 |
| 12 | 81 | 9.2 | 6 | 376.8 | 0.46 |
| 13 | 87 | 10.1 | 6.5 | 408.2 | 0.505 |
| 14 | 90 | 10.7 | 7 | 439.6 | 0.535 |
| 15 | 98 | 9.5 | 7.5 | 471 | 0.475 |
| 16 | 103 | 9.4 | 8 | 502.4 | 0.47 |
| 17 | 110 | 9.4 | 8.5 | 533.8 | 0.47 |
| 18 | 117 | 10.8 | 9 | 565.2 | 0.54 |
| 19 | 126 | 8 | 9.5 | 596.6 | 0.4 |
| 20 | 131 | 9.2 | 10 | 628 | 0.46 |

Date 7/8/2023

Signature Deepak

NATIONAL INSTITUTE OF TECHNOLOGY DURGAPUR

DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING



PAGE:

SIGNATURE:

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
|----|---|----------------------------|--------------------|------------------|------------|----------------------|--------------------|---|---|---|---|---|---|---|
| | | | Wear(mic ro meter) | Frictional force | Time(min.) | Sliding distance (m) | Coeff. of friction | | | | | | | |
| 2 | | 07-08-2023 | | | | | | | | | | | | |
| 3 | | Load = 20 N | 12 | 7.3 | 0.5 | 31.4 | 0.365 | | | | | | | |
| 4 | | Initial wt.= 1.8785 gm | 23 | 8.5 | 1 | 62.8 | 0.425 | | | | | | | |
| 5 | | Final wt.=1.8753 gm | 31 | 7.8 | 1.5 | 94.2 | 0.39 | | | | | | | |
| 6 | | D=track dia.=100mm | 41 | 7.1 | 2 | 125.6 | 0.355 | | | | | | | |
| 7 | | RPM=200 | 47 | 8 | 2.5 | 157 | 0.4 | | | | | | | |
| 8 | | Time= 10 min. | 50 | 10.1 | 3 | 188.4 | 0.505 | | | | | | | |
| 9 | | | 59 | 5.6 | 3.5 | 219.8 | 0.28 | | | | | | | |
| 10 | | | 63 | 6 | 4 | 251.2 | 0.3 | | | | | | | |
| 11 | | | 64 | 10.3 | 4.5 | 282.6 | 0.515 | | | | | | | |
| 12 | | NAME: DEEP NARAYAN | 72 | 6.1 | 5 | 314 | 0.305 | | | | | | | |
| 13 | | ROLL NO.:20MM8051 | 73 | 10.4 | 5.5 | 345.4 | 0.52 | | | | | | | |
| 14 | | REG. NO.: 20U10719 | 81 | 9.2 | 6 | 376.8 | 0.46 | | | | | | | |
| 15 | | GROUP NUMBER: 3 | 87 | 10.1 | 6.5 | 408.2 | 0.505 | | | | | | | |
| 16 | | EXPERIMENT NO.: 2 | 90 | 10.7 | 7 | 439.6 | 0.535 | | | | | | | |
| 17 | | EXPERIMENT DATE: 7-8-2023 | 98 | 9.5 | 7.5 | 471 | 0.475 | | | | | | | |
| 18 | | SUBMISSION DATE: 14-8-2023 | 103 | 9.4 | 8 | 502.4 | 0.47 | | | | | | | |
| 19 | | | 110 | 9.4 | 8.5 | 533.8 | 0.47 | | | | | | | |
| 20 | | | 117 | 10.8 | 9 | 565.2 | 0.54 | | | | | | | |
| 21 | | | 126 | 8 | 9.5 | 596.6 | 0.4 | | | | | | | |
| 22 | | | 131 | 9.2 | 10 | 628 | 0.46 | | | | | | | |

The graph displays the relationship between the coefficient of friction and the sliding distance during the experiment. The x-axis represents the sliding distance in meters, ranging from 0 to 700. The y-axis represents the coefficient of friction, ranging from 0 to 0.6. The data points are connected by a blue line, showing significant fluctuations throughout the test.

| Sliding Distance (m) | Coefficient of friction |
|----------------------|-------------------------|
| 0 | 0.40 |
| 50 | 0.45 |
| 100 | 0.42 |
| 150 | 0.48 |
| 200 | 0.45 |
| 250 | 0.40 |
| 300 | 0.45 |
| 350 | 0.42 |
| 400 | 0.48 |
| 450 | 0.45 |
| 500 | 0.40 |
| 550 | 0.45 |
| 600 | 0.42 |
| 650 | 0.48 |
| 700 | 0.45 |

SIGNATURE: