



Data Collection / Trial Wheel Documentation



SDoc000036_01_0001_021219_10:25

General Information

Customer	Rane
Objective	Customer Trial
Date of Trial	
Location	
Contact Person	
Mobile Number	
Mail Id	

Machine Tool

Machine Model	EG200
Machine Number	502286
Wheel Head Type	Anti Friction/ Roller Bearings
Guideway Type Xaxis	V & Flat
Grinding Wheel Motor Power kW	5.5
Work Holding Type	Between Centers
Steady Rest	
Flagging Type	
Flagging Make	
Flagging Model	
Wheel Balancer Type	
Wheel Balancer Make	
Wheel Balancer Model	
Automation	
Gap Crash Make	
Gap Crash Model	

Consumables Details

Wheel Make	CUMI
Wheel Specs	DA60K5W20
Abrasive Grain Size	60
Maximum Cutting Speed mps	45
Dresser Type	Blade
Dia Roll Size	
Coolant Type	Water Soluble
Coolant Make	Mobil

Workpiece Details

Component Name	Pinion M/CD RHD
Material	SCM420H
Hardness	58-63
Initial Component Dia mm	19.6685
Stock on OD mm	0.3

Operational Parameters

Dressing Feed Rate OD mmpmin	154
Dressing Frequency	10

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General Information

Customer	Cumi
Objective	Internal Trial
Date of Trial	2019-06-01T02:03
Location	
Contact Person	Cumi
Mobile Number	
Mail Id	

Machine Tool

Machine Model	H Grind250
Machine Number	20152
Wheel Head Type	Hydrodynamic
Guideway Type Xaxis	V & Flat
Grinding Wheel Motor Power kW	11
Work Holding Type	Between Centers
Steady Rest	
Flagging Type	Active
Flagging Make	
Flagging Model	T-25
Wheel Balancer Type	Spindle
Wheel Balancer Make	
Wheel Balancer Model	ST-1300 + P7 WB
Automation	
Gap Crash Make	
Gap Crash Model	

Consumables Details

Wheel Make	
Wheel Specs	CS33A 120HH5 VB1 15
Abrasive Grain Size	0
Maximum Cutting Speed mps	45
Dresser Type	Blade
Dia Roll Size	
Coolant Type	Water Soluble
Coolant Make	Houghton

Workpiece Details

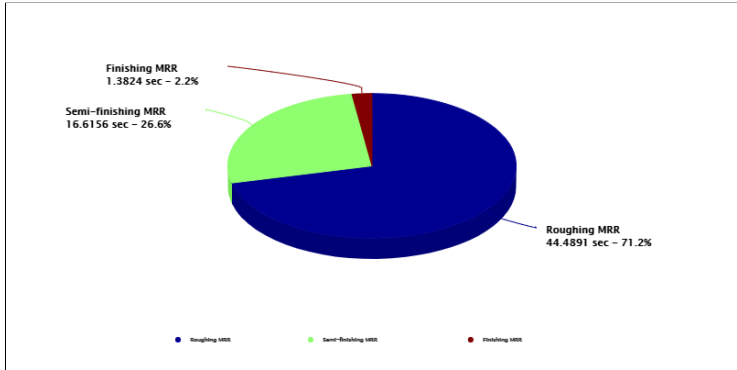
Component Name	SHAFT INTERMEDIATE
Material	
Hardness	58-60 HRC
Initial Component Dia mm	40.038
Stock on OD mm	0.3

Operational Parameters

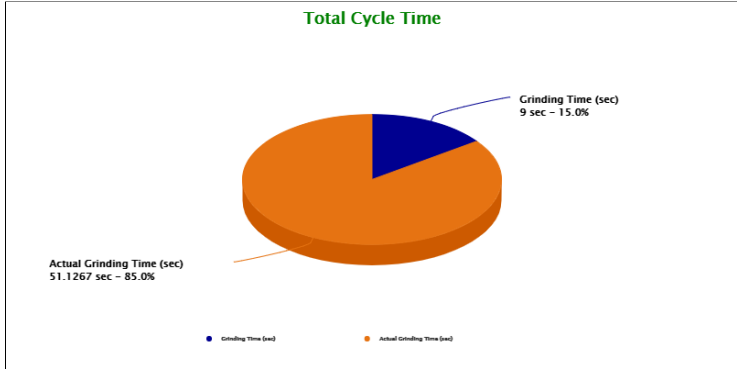
Dressing Feed Rate OD mmpmin	100
Dressing Frequency	10

Quality Parameters				
Item	Target		Achieved	
	Lower	Upper	Lower	Upper
OD_Tolerance (mm)	11.999	12.002		
Surface Finish-Ra(μm)	0.488	0.592		
Rz(μm)				
Concentricity(mm)		0.002		

Calculated Parameters	
Item	Value
Roughing MRR (cu. mm/s)	44.4891
Semi-finishing MRR (cu. mm/s)	16.6156
Finishing MRR (cu. mm/s)	1.3824
Wheel : Work Ratio	23.0721
Equivalent Diameter (mm)	18.8395
Overlap Ratio OD	9.9875
Overlap Ratio Face	0
Overlap Ratio Radius	0
Dress Lead OD (mm/rev)	0.0801
Dress Lead Face (mm/rev)	0
Dress Lead Radius (mm/rev)	0

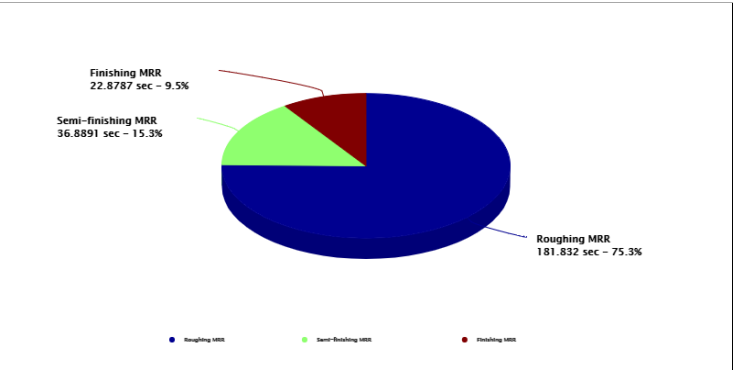


Total Cycle Time	
Item	Value
Grinding Time (sec)	9
Non Grinding Time (sec)	12
Total Grinding Time (sec)	21
Actual Grinding Time (sec)	51.1267

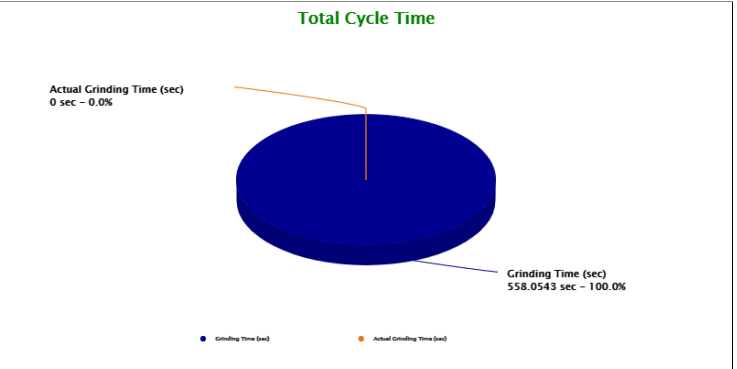


Quality Parameters				
Item	Target		Achieved	
	Lower	Upper	Lower	Upper
OD_Tolerance (mm)				
Surface Finish-Ra(μm)				
Rz(μm)				
Concentricity(mm)				

Calculated Parameters	
Item	Value
Roughing MRR (cu. mm/s)	181.832
Semi-finishing MRR (cu. mm/s)	36.8891
Finishing MRR (cu. mm/s)	22.8787
Wheel : Work Ratio	0
Equivalent Diameter (mm)	35.3237
Overlap Ratio OD	17.192
Overlap Ratio Face	0
Overlap Ratio Radius	0
Dress Lead OD (mm/rev)	0.0349
Dress Lead Face (mm/rev)	0
Dress Lead Radius (mm/rev)	0



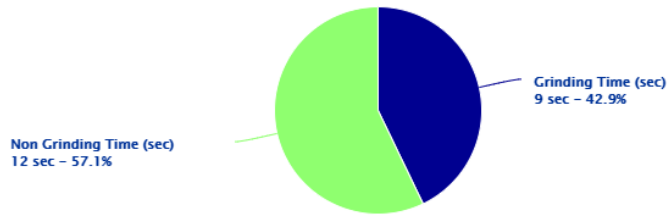
Total Cycle Time	
Item	Value
Grinding Time (sec)	558.0543
Non Grinding Time (sec)	0
Total Grinding Time (sec)	558.0543
Actual Grinding Time (sec)	0



Grinding Time and Non Grinding Time Drilldown

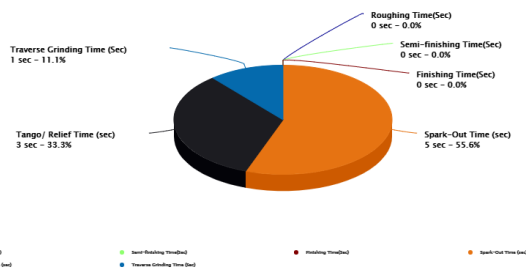
A pie chart illustrating the distribution of time between grinding and non-grinding activities. The chart is divided into two segments: a dark blue segment representing grinding time and a light blue segment representing non-grinding time. The grinding time segment is labeled with a dark blue line and text, while the non-grinding time segment is labeled with a light blue line and text.

Category	Time (sec)	Percentage
Grinding Time (sec)	9	42.9%
Non Grinding Time (sec)	12	57.1%



Calculated Time	
Item	Value
Roughing Time(Sec)	0
Semi-finishing Time(Sec)	0
Finishing Time(Sec)	0
Spark-Out Time (sec)	5
Tango/ Relief Time (sec)	3
Traverse Grinding Time (Sec)	1

Item	Value
Roughing Time(Sec)	0
Semi-finishing Time(Sec)	0
Finishing Time(Sec)	0
Spark-Out Time (sec)	5
Tango/ Relief Time (sec)	3
Traverse Grinding Time (Sec)	1



Grinding Time and Non Grinding Time Drilldown

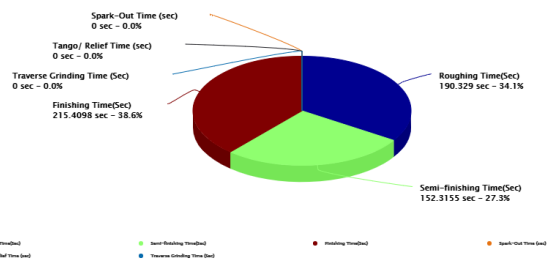
A pie chart illustrating the distribution of time between grinding and non-grinding activities. The chart is almost entirely dark blue, representing grinding time, with a single, extremely thin light blue slice at the top representing non-grinding time. A green line points from the text 'Non Grinding Time (sec)' to the thin slice, and a blue line points from the text 'Grinding Time (sec)' to the large blue area.

Category	Time (sec)	Percentage
Non Grinding Time	0	0.0%
Grinding Time	558.0543	100.0%



Calculated Time	
Item	Value
Roughing Time(Sec)	0
Semi-finishing Time(Sec)	0
Finishing Time(Sec)	0
Spark-Out Time (sec)	5
Tango/ Relief Time (sec)	3
Traverse Grinding Time (Sec)	1

Item	Value
Roughing Time(Sec)	0
Semi-finishing Time(Sec)	0
Finishing Time(Sec)	0
Spark-Out Time (sec)	5
Tango/ Relief Time (sec)	3
Traverse Grinding Time (Sec)	1

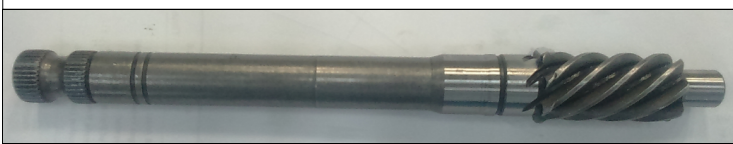


Remarks
At 100 skip, the Ra was 0.48 mic therefore we reduced the work RPM from 1105 to 1050 (Rough) & 1086 to 1000 (Finish) after which there was improvement in Ra. So, we further increased the dress skip from 100 to 150 wherein all quality parameters like Ra, Profile & TR were ok however the curvature was getting narrower by upto 8 mic so we increased the dressing depth from 0.020mm to 0.030mm, which has controlled the curvature but when we further increased the skip from 150 to 200, again the curvature started getting narrower. So acc to the customer, they would run & monitor the wheel at 150 skip for now & if they will feel comfortable with the performance then they would increase the skip by themself. During the entire trial there was no abnormality observed in the GCM readings. All std room reports & GCM reports are attached for reference.

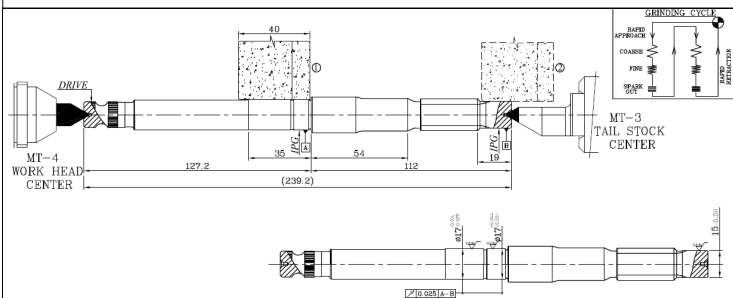
At 100 skip, the Ra was 0.48 mic therefore we reduced the work RPM from 1105 to 1050 (Rough) & 1086 to 1000 (Finish) after which there was improvement in Ra. So, we further increased the dress skip from 100 to 150 wherein all quality parameters like Ra, Profile & TR were ok however the curvature was getting narrower by upto 8 mic so we increased the dressing depth from 0.020mm to 0.030mm, which has controlled the curvature but when we further increased the skip from 150 to 200, again the curvature started getting narrower. So acc to the customer, they would run & monitor the wheel at 150 skip for now & if they will feel comfortable with the performance then they would increase the skip by themself. During the entire trial there was no abnormality observed in the GCM readings. All std room reports & GCM reports are attached for reference.

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Component	Value
1. Introduction	10%
2. Background	15%
3. Methodology	25%
4. Results	30%
5. Conclusion	10%
6. References	10%



Grinding Layout



Process

Grinding Layout

GRINDING LAYOUT Component As In The Machine

Job Driver

Active Finishing

MT-5 WORK HEAD CENTER

305.79

MT-5 TAIL STOCK CENTER

60

Component As Leaves The Machine

7.5.005
+0.005
-0.000

5.912

7.5.005
+0.005
-0.000

16.002

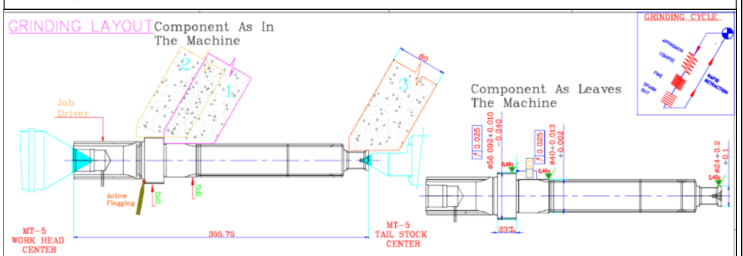
23.7

8.00+0.2
-0.0

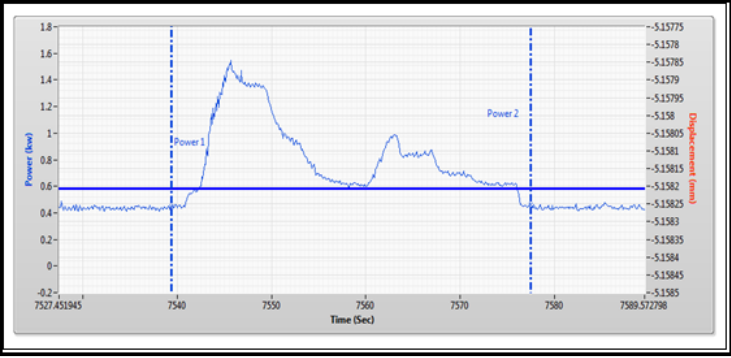
GRINDING CYCLE

The diagram illustrates the grinding layout of a component. It shows the component in two states: 'Component As In The Machine' and 'Component As Leaves The Machine'. The machine view shows the component mounted between two MT-5 centers, with a distance of 305.79 between them. The component is shown with various dimensions and tolerances. The 'Component As Leaves The Machine' view shows the component with dimensions 60, 7.5.005 (+0.005/-0.000), 5.912, 7.5.005 (+0.005/-0.000), 16.002, 23.7, and 8.00+0.2/-0.0. A grinding cycle diagram is also included, showing the sequence of grinding operations.

Grinding Layout



Macgine Signature



Process Layout

