ZEWAIL CITY

MARCH 2024

ENGEENIRING PRODUCTION

Group 2, task 1

PRESENTED BY

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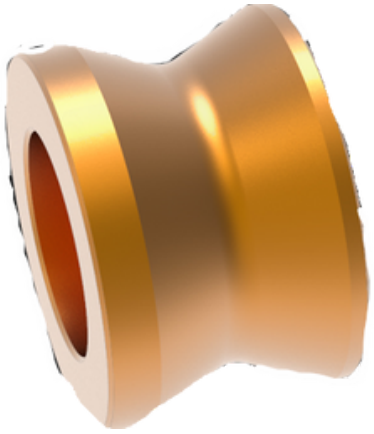
asmaa sabry mai elsherif abdelrahman naqeeb ziad reda

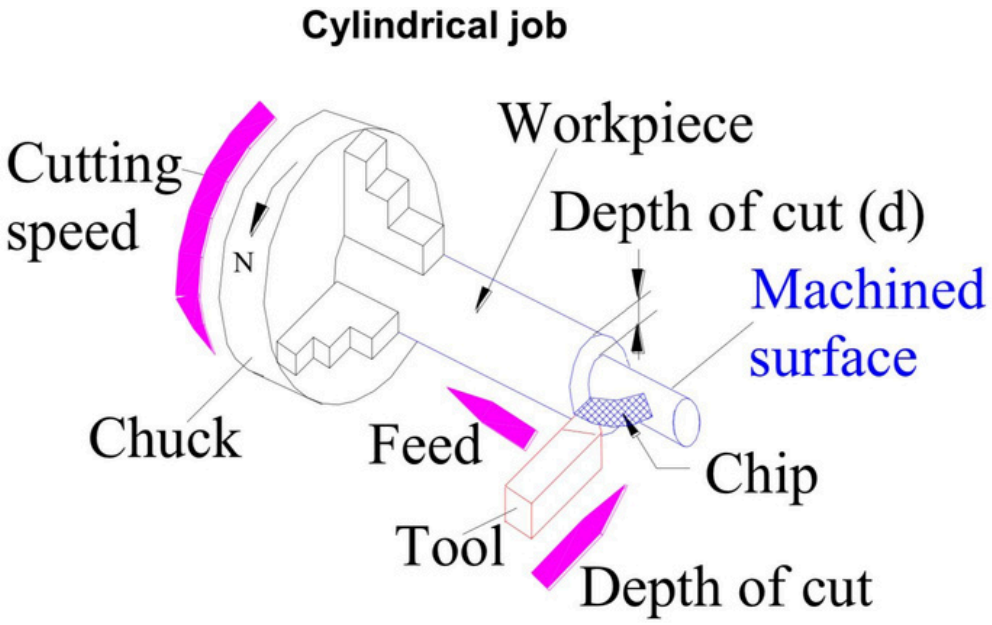
P-1003 Rocket Assembly:



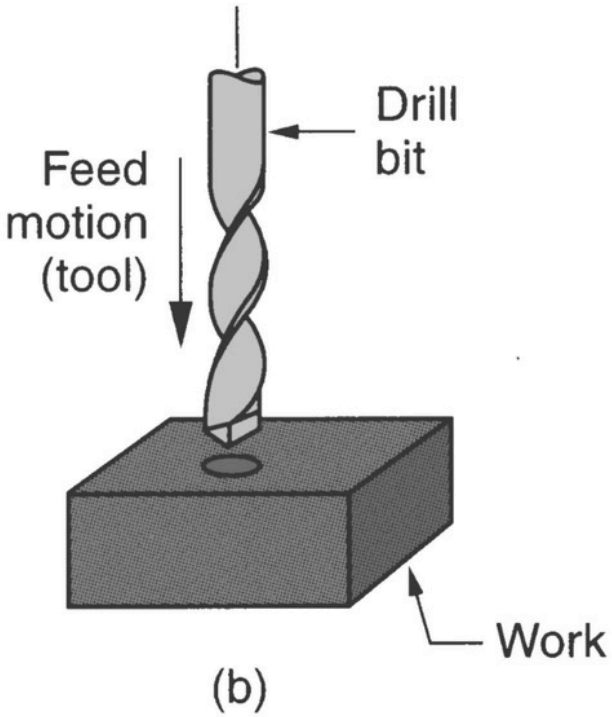
DIMENSIONS OF WORK PIECE :
INITIAL LENGTH- 0.8 IN
INITIAL DIAMETER-1 IN

PROCESSES IN ARRANGMENT

EXTERNAL TURNING

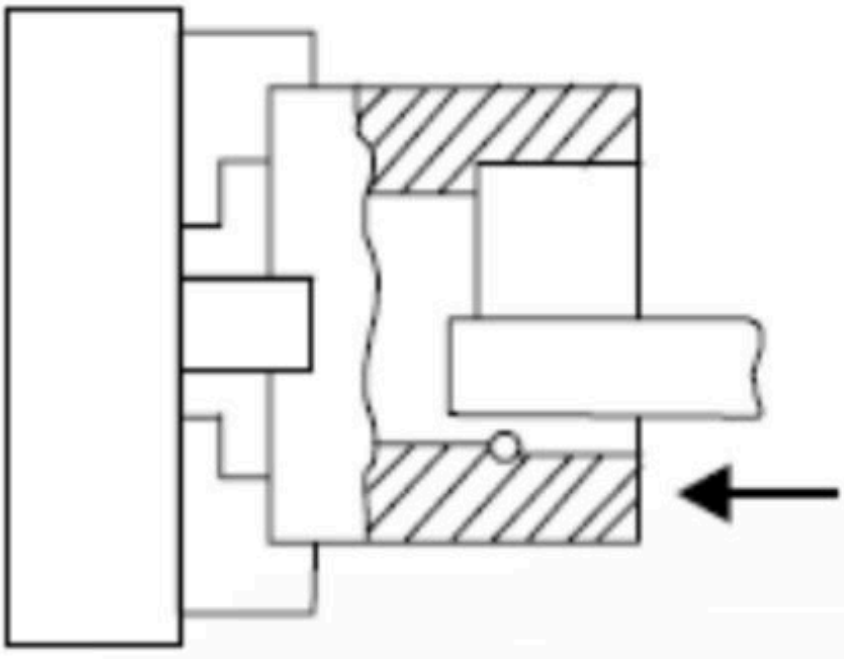


DRILLING



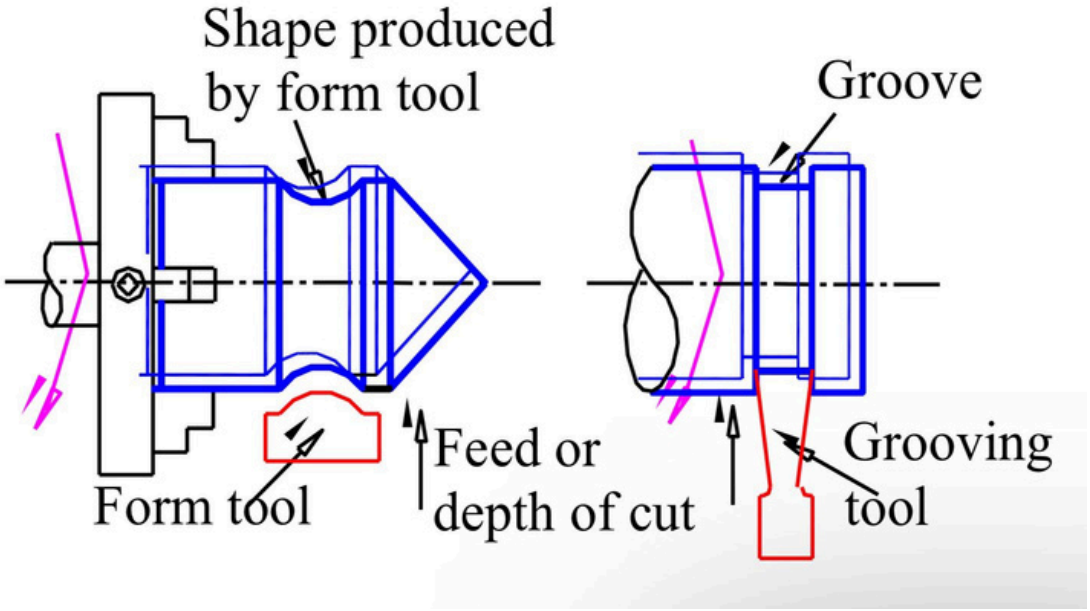
(b)

BORING

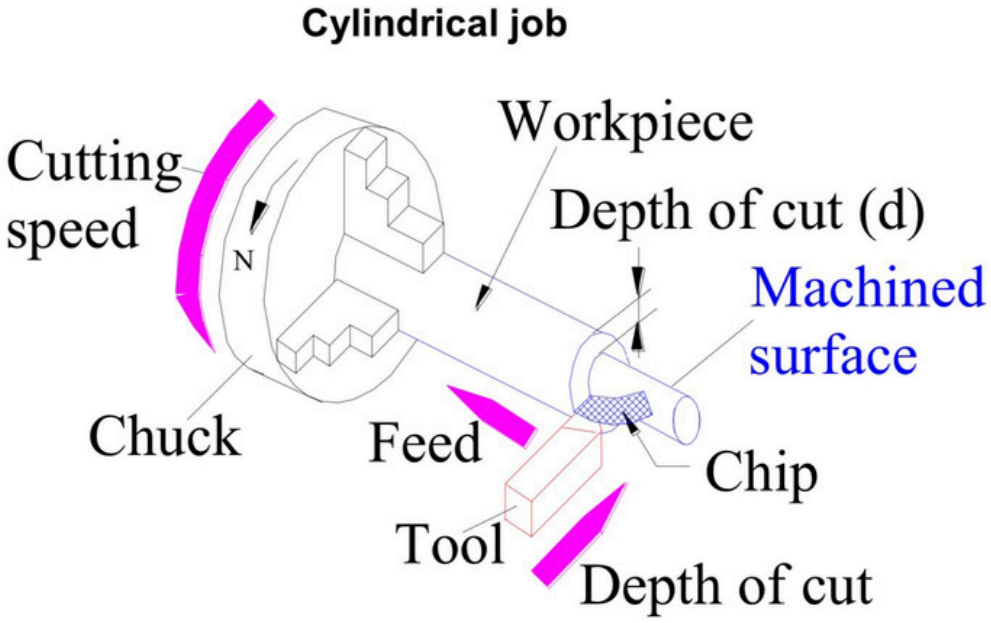


Boring

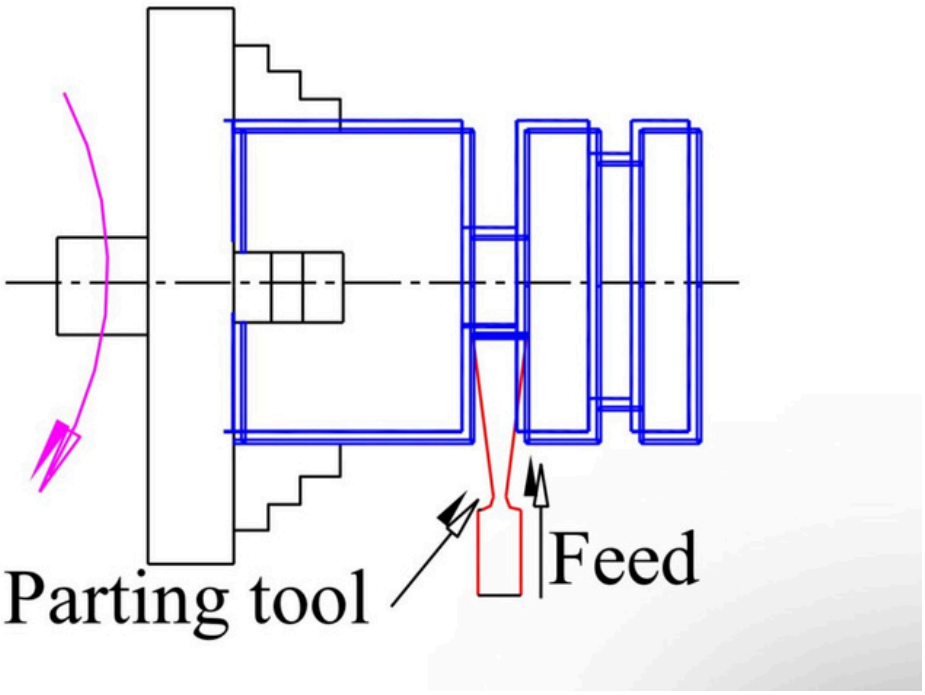
GROOVING



EXTERNAL TURNING #2



PARTING OFF



CALCULATIONS

P-1003 Manufacturing Process:

① external turning:

$\ell_o = 0.8$ in, $D_o = 1$ in, $N = 2,300$ rpm

recommended Feed: 0.005 inch/rev

a (depth of cut) $= \frac{1 - 0.732}{2} = 0.134$

$t_m = \frac{0.8}{0.005 \times 2,300} = 0.0695$ min

$MRR = 0.134 \times 0.008 \times \pi \times 1 \times 2,300$

$= 4.84$ in/min

② Drilling: $a = 0.125$ in

recommended Feed: 0.004 in/rev

$t_m = 0.086$ min

$MRR = 3.612$ in/min

③ Boring: $a = 0.515$ in

recommended Feed: 0.002 in/rev

$t_m = 0.17$ min

$MRR = 7.442$ in/min

④ Turning: $a = 0.025$ in

recommended Feed: 0.008 in/rev

$t_m = 0.4347$ min

$MRR = 1.445$ in/min

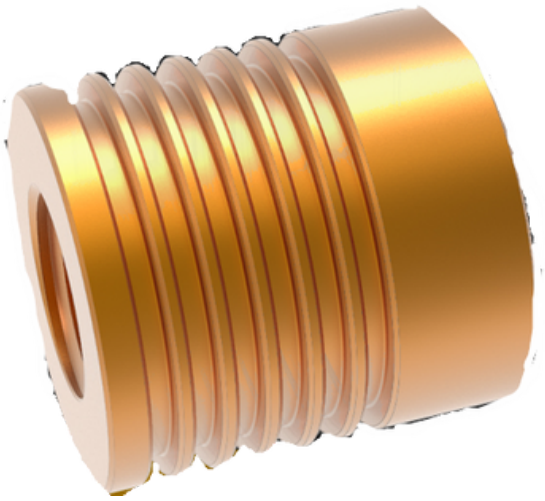
⑤ grooving: $a = 0.624$

recommended Feed: 0.001

$t_m = 0.347$ min

$MRR = 0.462$ inch/min

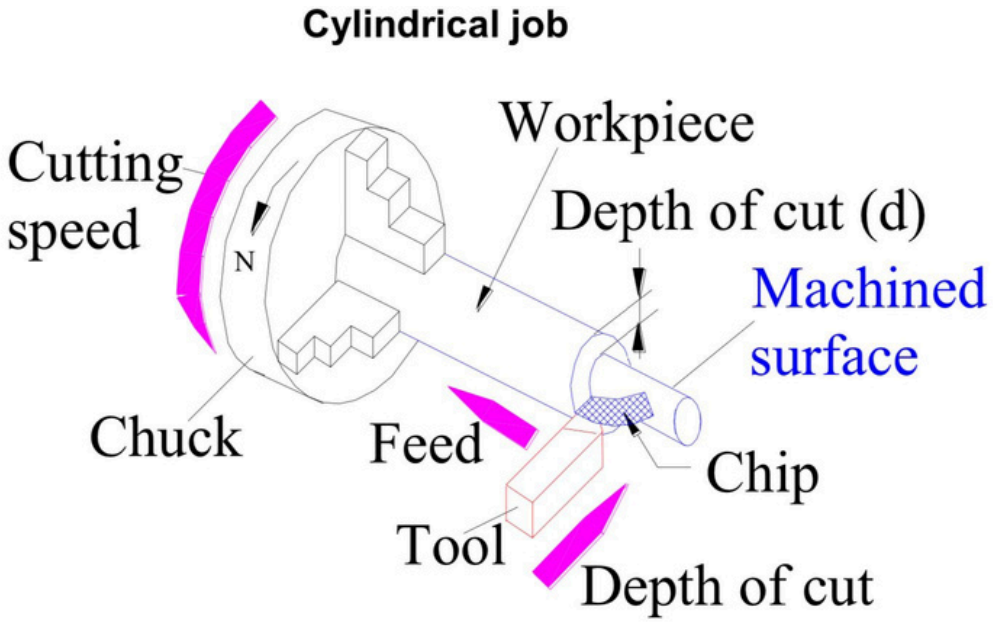
P-1004 Rocket Assembly:



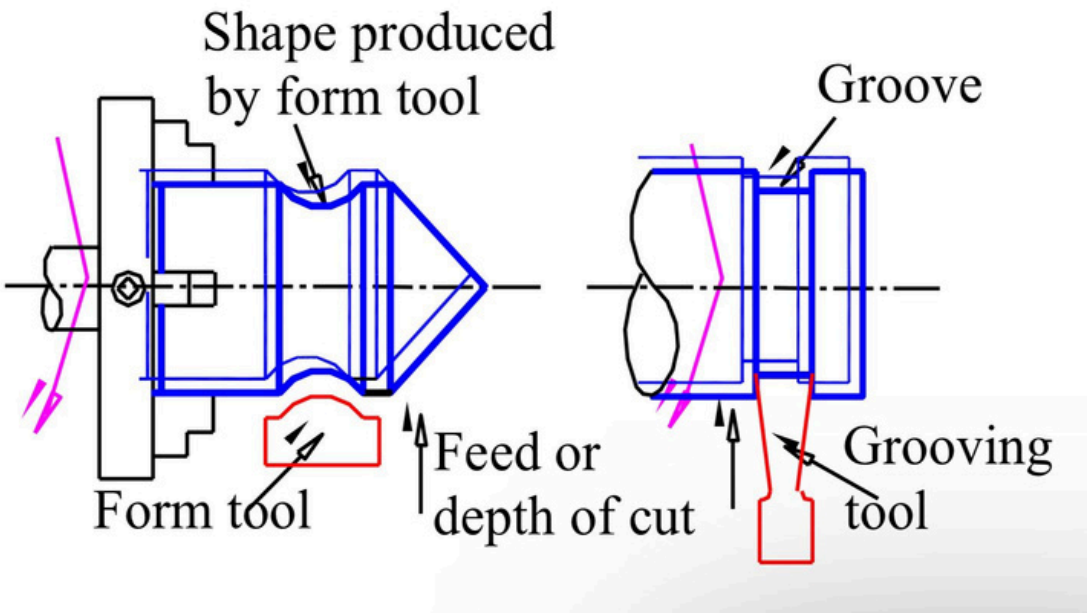
DIMENSIONS OF WORK PIECE :
INITIAL LENGTH- 1.2 IN
INITIAL DIAMETER-1 IN

PROCESSES IN ARRANGMENT

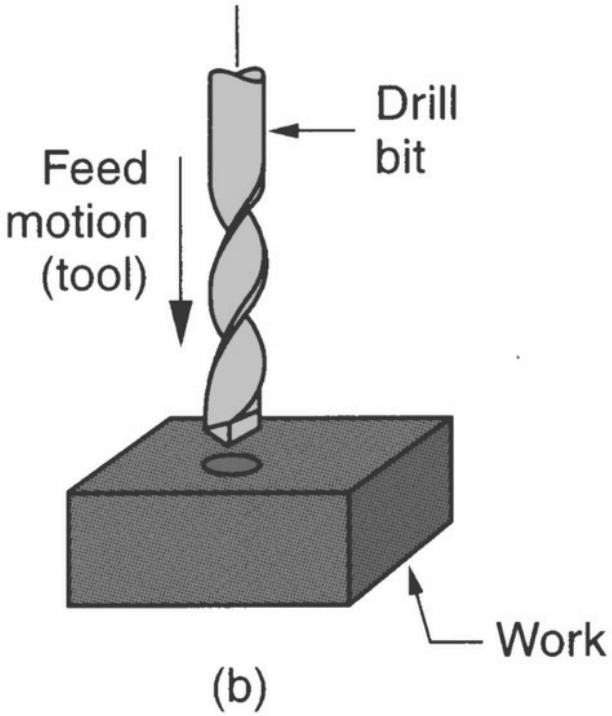
EXTERNAL TURNING



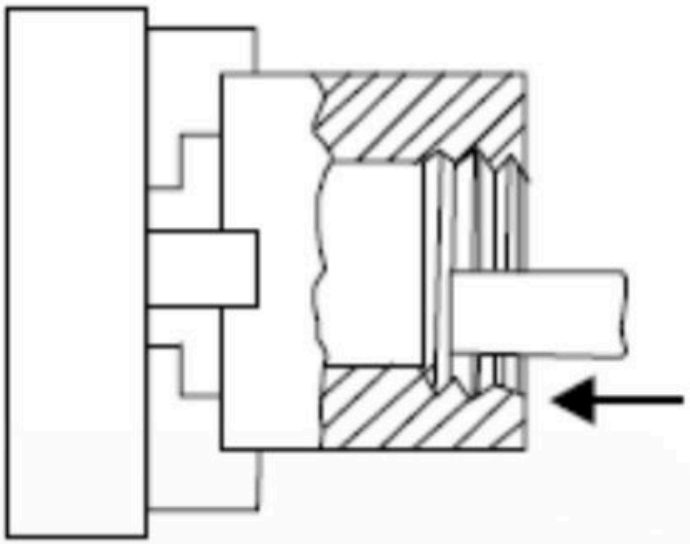
GROOVING



DRILLING

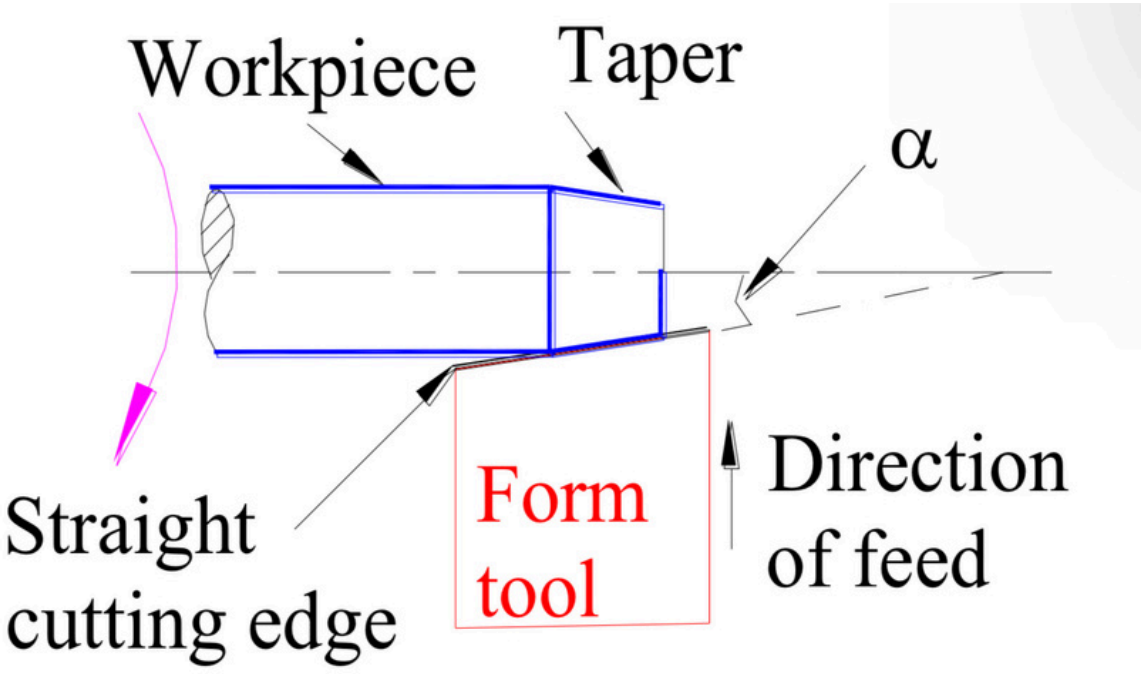


INTERNAL THREDAING

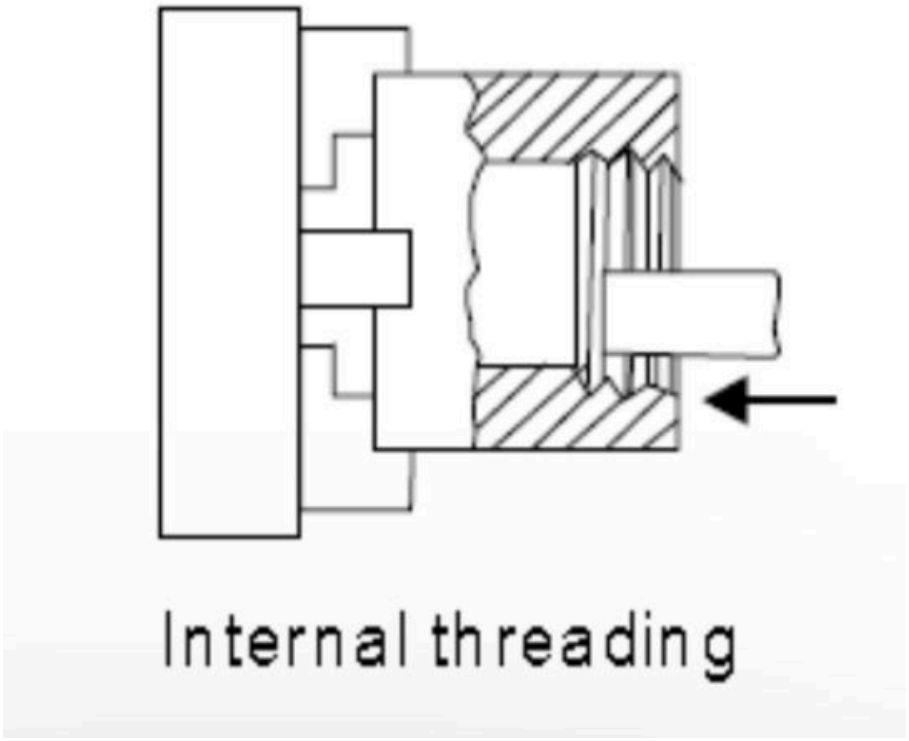


Internal threading

INTERNAL TAPER TURNING

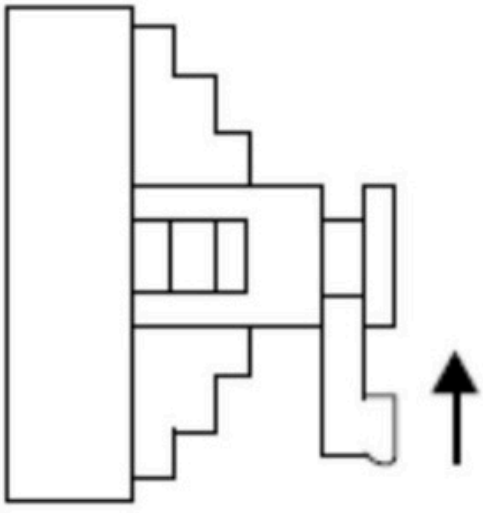


INTERNAL THREADING #2



Internal threading

PARTING



Parting or cutting off

CALCULATIONS

P_1004 Manufacturing Process:

① external turning: $a = 0.025$ in

recommended Feed: 0.005 in/rev

$t_m = 0.1043$ min

$M_{RR} = 0.9032$

② Grooving: $a = 0.06$, no of grooves: 6 → l of each groove: 0.006 in

recommended Feed: 0.01 in/rev

$t_m = 0.026$ for 1 groove $\xrightarrow{\times 6}$ 0.1565

$M_{RR} = 0.41186$ for 1 groove $\xrightarrow{\times 6}$ 2.471167

③ Drilling: $t_m = \dfrac{d + \frac{D}{2}\tan(90 - \frac{\phi}{2})}{FN}$ $\quad M_{RR} = \frac{\pi}{4} \times D^2 \times FN$

$a = 1$ in

recommended Feed: 0.004 in/rev

$t_m = 0.118586$

$M_{RR} = 1.806415776$

④ Internal threading (1st threading)

recommended Feed: 0.002 in/rev

$D = \frac{1}{2}$ in, $a = 0.320$ in

$t_m = 0.089346$ min

$M_{RR} = 0.9032079$

(2nd threading)

$D = \frac{3}{8}$ in, $a = 0.320$ in

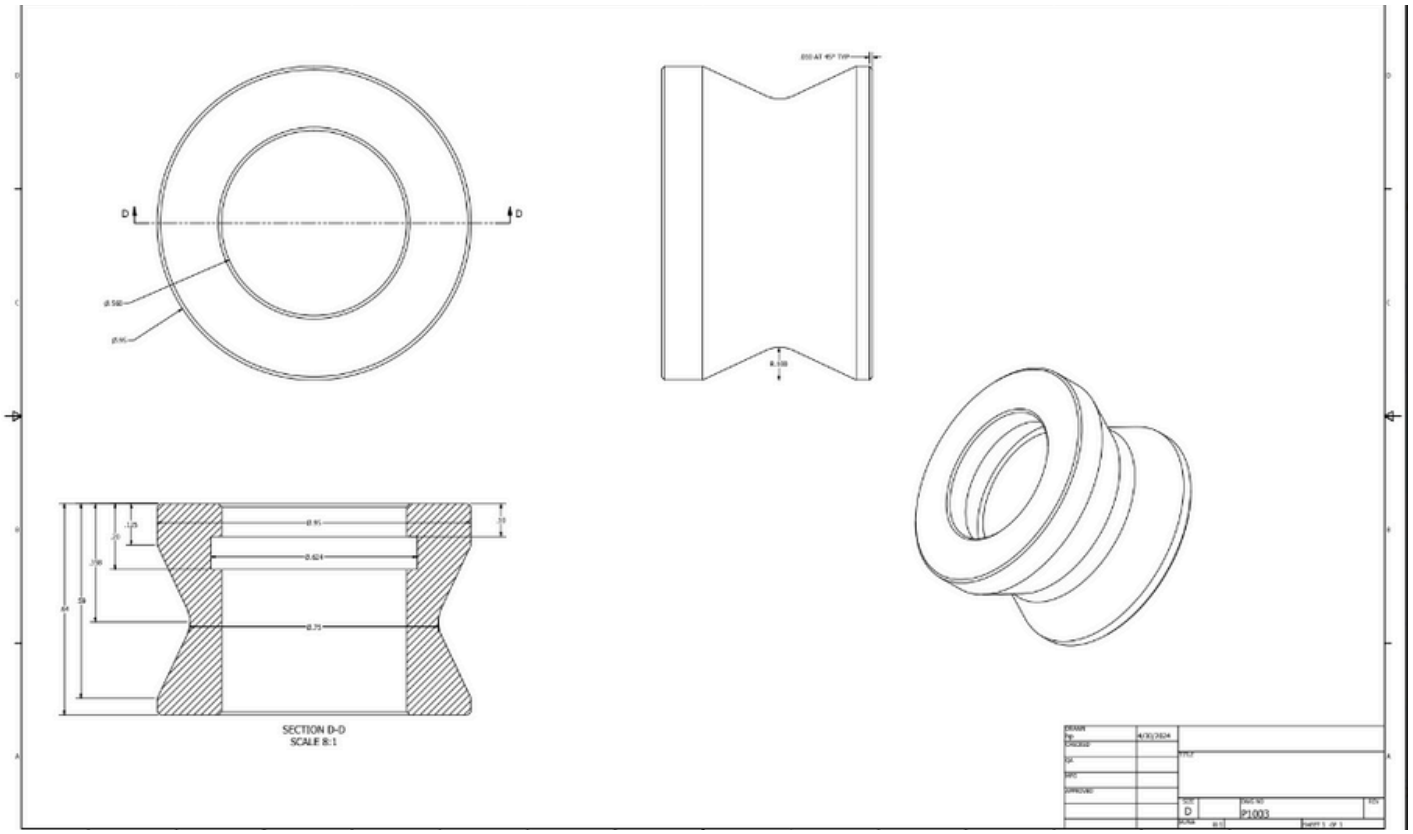
recommended Feed: 0.002 in/rev

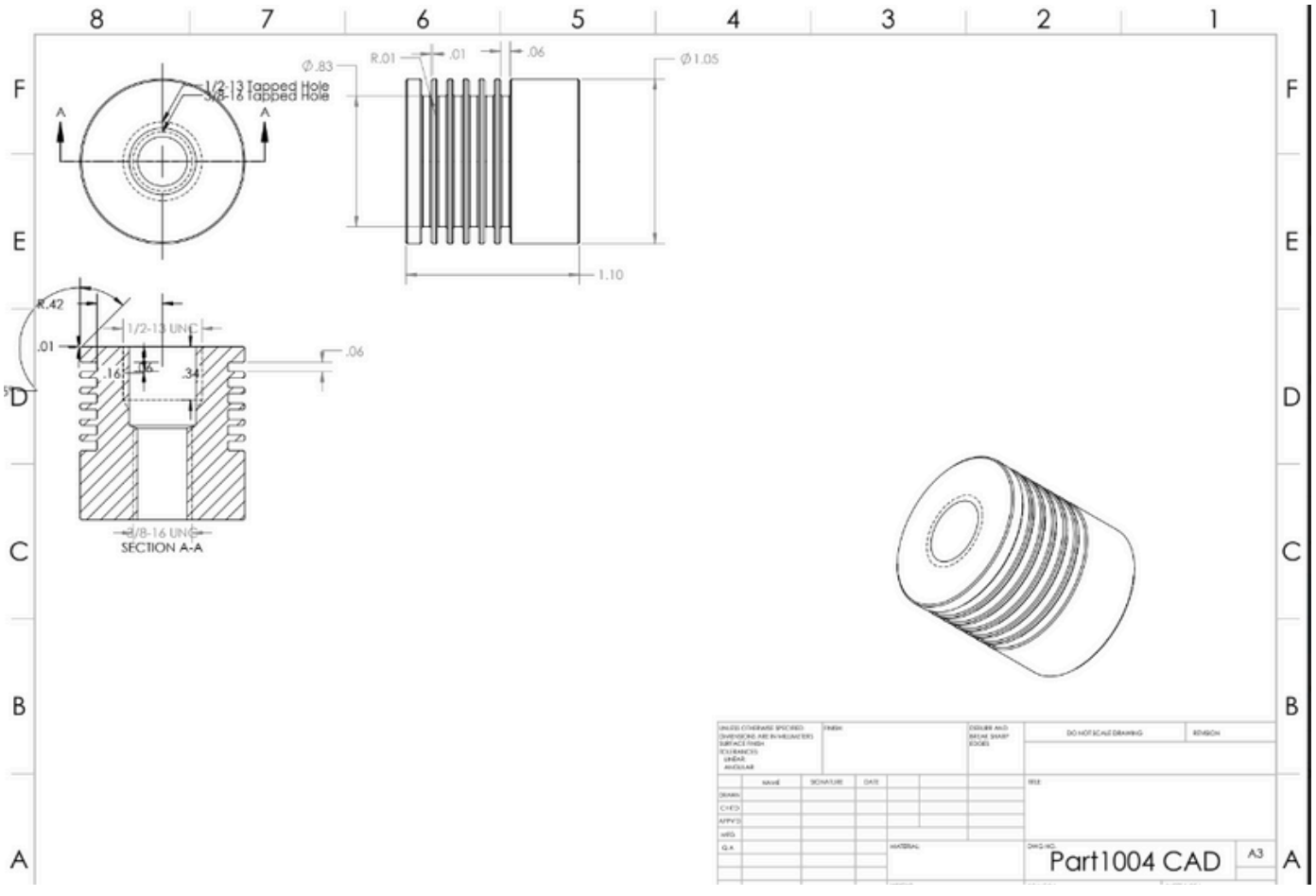
$t_m = 0.0844$ min

$M_{RR} = 0.50805$

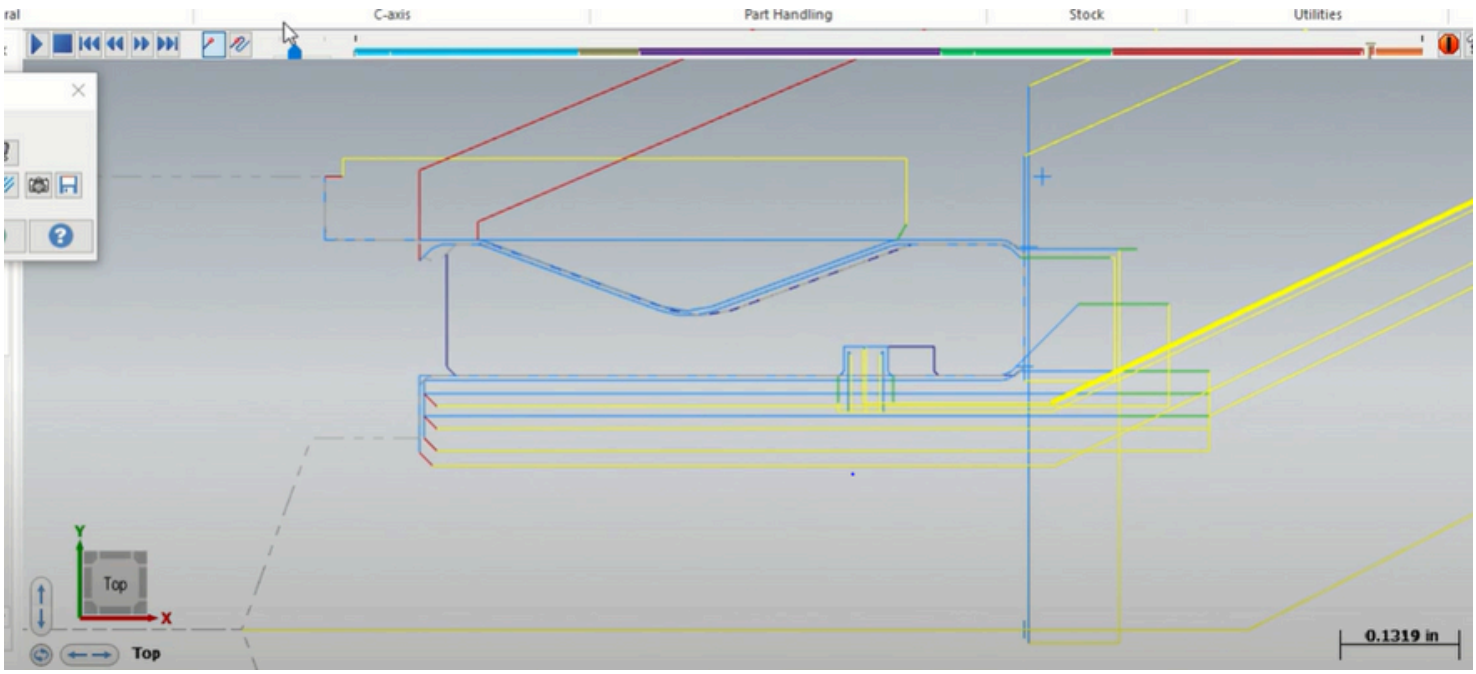
NOTES: THE MACHINE TIME IS SUBJECTED TO AN INCREASE DUE TO THE SETUP TIME AND MOVING TIME BETWEEN PROCESSES.

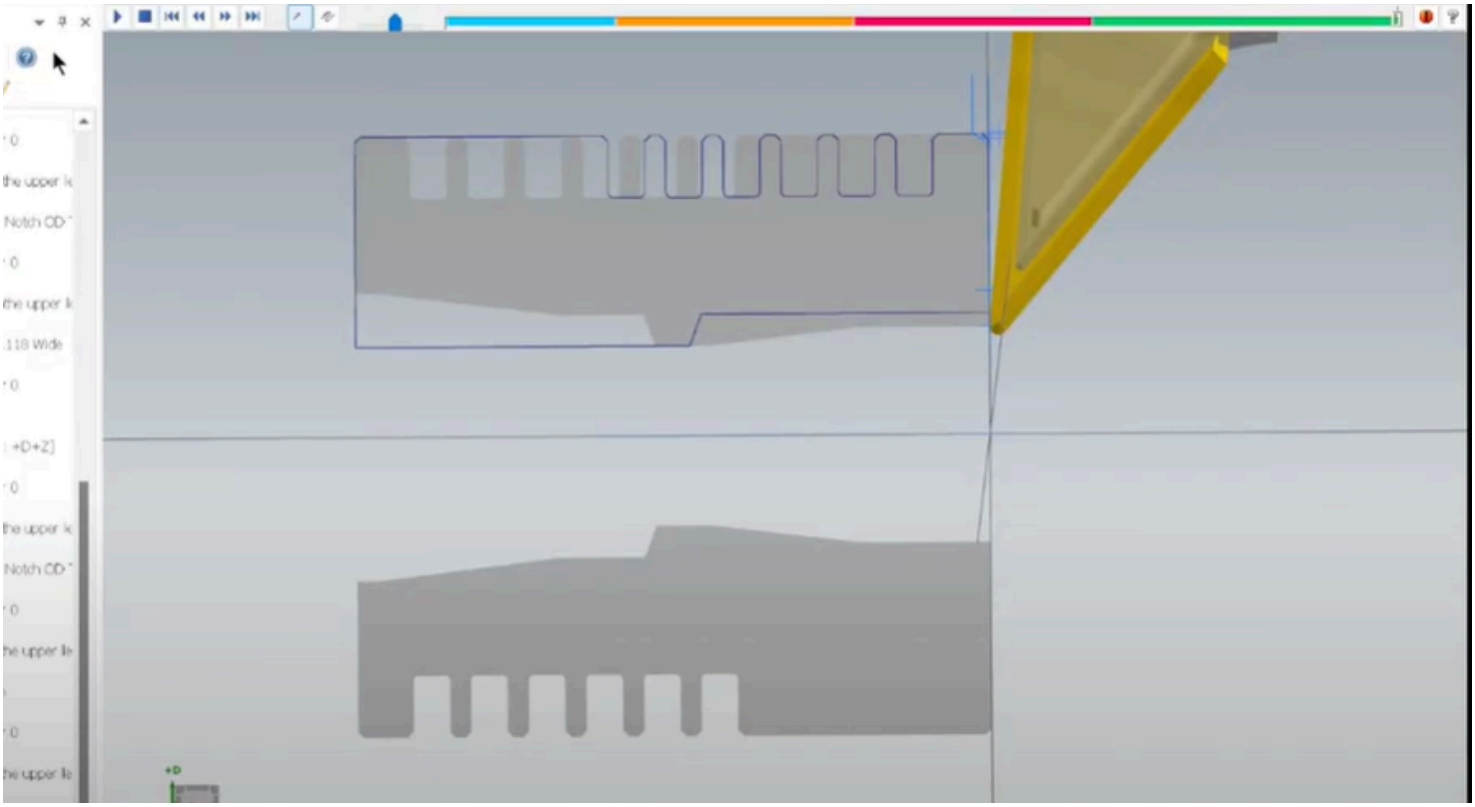
CAD PHOTOS


SECTION D-D
SCALE 8:1
P1003


1/2-13 Tapped Hole
3/8-16 Tapped Hole
Ø.83
R.01
.01
.06
Ø1.05
1.10
R.42
1/2-13 UNC
.16
.34
.06
3/8-16 UNC
SECTION A-A
Part1004 CAD
A3

CAM PHOTOS





COMPARISON BETWEEN THEORY AND ACTUAL

ACTUAL TIME :

2 MINUTES AND 24 SECONDS

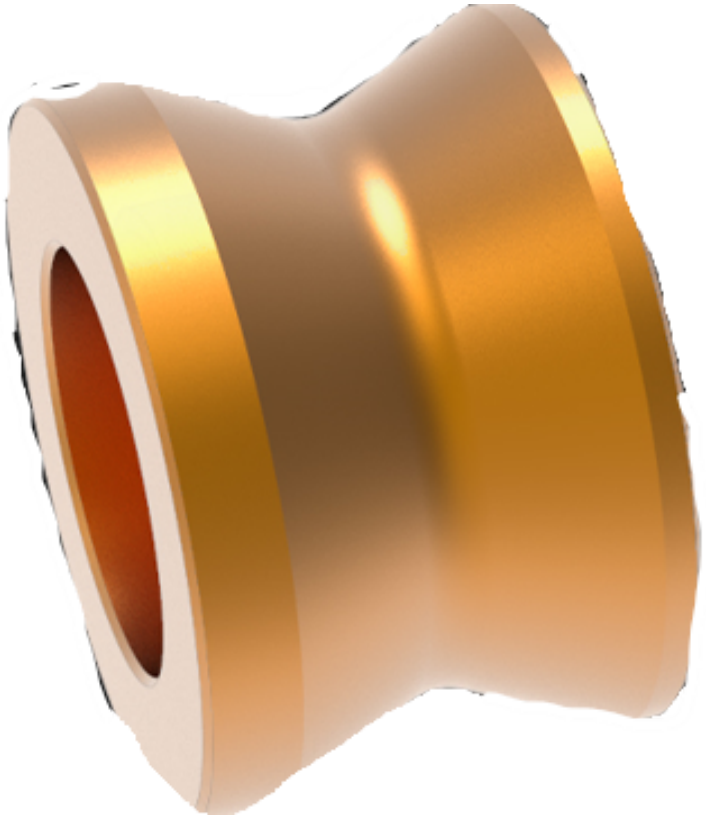
THEORITICAL TIME :

1 MINUTE AND 1 SECOND

JUSTIFICATION :

- THE VIDEO HAS BEEN SPED UP
- THERES THE SET UP TIME THAT WASNT TAKEN INTO CONSIDERATION
- THE FEED RATES IN THE VIDEO ARE DIFFERENT

THE AVERAGE FEED RATE IN THE VIDEO :0.0046875 IN/ REV IN THE VIDEO WHILE THE AVERAGE IN THEORY WAS 0.004 IN/REV



COMPARISON BETWEEN THEORY AND ACTUAL

ACTUAL TIME :

1 MINUTE AND 2 SECONDS

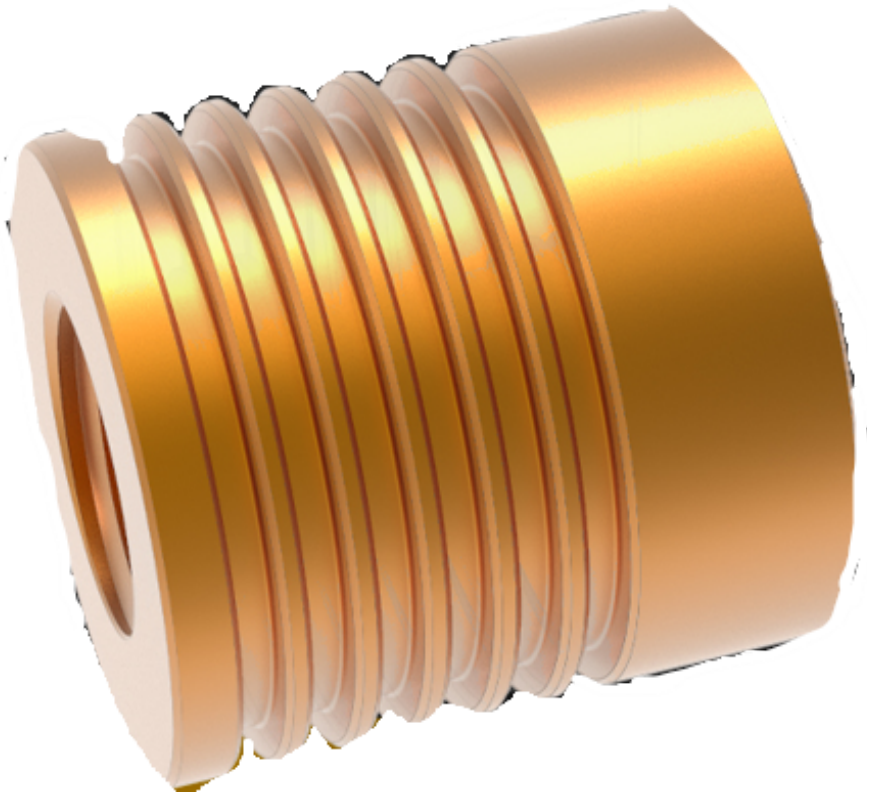
THEORITICAL TIME :

42 SECONDS

JUSTIFICATION :

- THE VIDEO HAS BEEN SPED UP
- THERES THE SET UP TIME THAT WASNT TAKEN INTO CONSIDERATION
- THE FEED RATES IN THE VIDEO ARE DIFFERENT

THE AVREGAGE FEED RATE IN THEORY WAS 0.0028 IN/REV WHILE THE ACTUSL WAS 0.019 IN/REV



THANK YOU

PRESENTED BY

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