

Mini-Lathe Metric Change Gear Tables

Standard gears: 20, 20, 35, 40, 40, 45, 50, 55, 57, 60, 65, 80, 80

Additional gears: 21, 32, 42, 77, 78, 79, 81

Calculations from:

https://littlemachineshop.com/reference/change_gears.php

Basic equation:

$TPI = 16 / ((A/B) \times (C/D))$

$Pitch = 25.4 / TPI = 1.5875 \times ((A/B) \times (C/D))$

Details on custom 3D printed gears:

<https://softsolder.com/2020/05/18/mini-lathe-metric-threading-stackable-change-gear-generator/>

Pitch A B C D Actual Error In 10 pitches

0.10

20	80	20	80	0.099	0.786%	0.008
20	79	20	80	0.100	0.468%	0.005
20	80	20	79	0.100	0.468%	0.005

0.20

20	79	40	80	0.201	0.473%	0.009
20	80	40	79	0.201	0.473%	0.009
40	79	20	80	0.201	0.473%	0.009
40	80	20	79	0.201	0.473%	0.009

0.25

20	55	35	81	0.249	0.225%	0.006
20	81	35	55	0.249	0.225%	0.006
35	55	20	81	0.249	0.225%	0.006

0.30

20	57	35	65	0.300	0.023%	0.001
20	65	35	57	0.300	0.023%	0.001

0.40

20	55	45	65	0.400	0.088%	0.004
20	65	45	55	0.400	0.088%	0.004

0.50

21	50	45	60	0.500	0.012%	0.001
21	60	45	50	0.500	0.012%	0.001
21	80	60	50	0.500	0.012%	0.001
42	35	21	80	0.500	0.012%	0.001
60	50	21	80	0.500	0.012%	0.001

0.60

35	57	40	65	0.600	0.022%	0.001
35	65	40	57	0.600	0.022%	0.001
40	57	35	65	0.600	0.022%	0.001
40	65	35	57	0.600	0.022%	0.001

0.70

35	55	45	65	0.699	0.087%	0.006
35	65	45	55	0.699	0.087%	0.006
45	55	35	65	0.699	0.087%	0.006
45	65	35	55	0.699	0.087%	0.006
50	77	55	81	0.700	0.006%	0.000
50	81	55	77	0.700	0.006%	0.000
55	77	50	81	0.700	0.006%	0.000

0.75

42	50	45	80	0.750	0.012%	0.001
42	80	45	50	0.750	0.012%	0.001
45	50	42	80	0.750	0.012%	0.001
45	80	42	50	0.750	0.012%	0.001

0.80

40	55	45	65	0.799	0.088%	0.007
40	65	45	55	0.799	0.088%	0.007
45	55	40	65	0.799	0.088%	0.007
45	65	40	55	0.799	0.088%	0.007
20	55	79	57	0.800	0.010%	0.001
20	57	79	55	0.800	0.010%	0.001

1.00

21	50	60	40	1.000	0.012%	0.001
42	50	45	60	1.000	0.012%	0.001
42	60	45	50	1.000	0.012%	0.001
42	80	60	50	1.000	0.012%	0.001
45	50	42	60	1.000	0.012%	0.001
45	60	42	50	1.000	0.012%	0.001
60	50	42	80	1.000	0.012%	0.001

1.25

21	50	60	32	1.250	0.013%	0.002
35	40	45	50	1.250	0.013%	0.002
42	40	45	60	1.250	0.013%	0.002
42	80	60	40	1.250	0.013%	0.002
45	40	42	60	1.250	0.013%	0.002
60	20	21	80	1.250	0.013%	0.002
60	40	42	80	1.250	0.013%	0.002

1.50

42	40	45	50	1.500	0.013%	0.002
45	40	42	50	1.500	0.013%	0.002

1.75

65	42	57	80	1.751	0.029%	0.005
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2.00

42	40	60	50	2.000	0.012%	0.003
42	50	60	40	2.000	0.012%	0.003
60	40	42	50	2.000	0.012%	0.003

2.50

42	32	60	50	2.500	0.012%	0.003
42	40	60	40	2.500	0.012%	0.003
42	50	60	32	2.500	0.012%	0.003
60	20	42	80	2.500	0.012%	0.003
60	32	42	50	2.500	0.012%	0.003

3.00

65	50	80	55	3.002	0.061%	0.018
65	55	80	50	3.002	0.061%	0.018
80	50	65	55	3.002	0.061%	0.018

3.50

57	40	65	42	3.501	0.029%	0.010
57	42	65	40	3.501	0.029%	0.010
65	21	57	80	3.501	0.029%	0.010
65	40	57	42	3.501	0.029%	0.010
65	42	57	40	3.501	0.029%	0.010

4.00

60	20	42	50	4.000	0.012%	0.005
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5.00

55	21	60	50	4.989	0.215%	0.107
55	35	80	40	4.989	0.215%	0.107
55	40	80	35	4.989	0.215%	0.107
60	21	55	50	4.989	0.215%	0.107
80	35	55	40	4.989	0.215%	0.107
80	40	55	35	4.989	0.215%	0.107
35	45	81	20	5.001	0.012%	0.006
45	55	77	20	5.001	0.012%	0.006
77	20	45	55	5.001	0.012%	0.006