

# TOLERANCES AND MATERIALS

## Thickness and Straightness Tolerances

Maximum Outside Diameter	<b>3.50"</b>	<b>6.13"</b>	<b>7.88"</b>	<b>11.25"</b>	<b>25.13" up to 30"</b>
Thickness	+0.03"/-0.03"	+0.06"/-0.03"	+0.06"/-0.03"	+0.09"/-0.03"	+0.13"/-0.03"
Straightness	0.03"	0.04"	0.05"	0.06" to 20"	0.06" to 30"

## External and Internal Tolerances

Maximum Outside Diameter	<b>3.91"</b>	<b>7.81"</b>	<b>11.72"</b>	<b>15.63"</b>	<b>15.63" up to 30"</b>
+EX, -INT	0.03"	0.06"	0.09"	0.13"	0.16"
Maximum Outside Diameter	11.63"	14.97"	18.28"	18.28" and up	18.28" and up
-EX, +INT	0.03"	0.04"	0.05"	0.06"	0.06"

## Weight and Mismatch Tolerances

3 to 5 pounds	Up to 25 pounds	Up to 50 pounds	Up to 100 pounds	Up to 300 pounds	Up to 800 pounds
0.03"	0.04"	0.05"	0.06"	0.06" up to 20"	0.09" up to 30"

■ Specifications listed are only guidelines. To learn what Clifford-Jacobs can do for you, please ask.

### CARBON, ALLOY, AND TOOL STEEL

1018, 1020, 1021, 1022, 1026, 1029, 1030, 1040, 1045, 1050, 1141, 1146, 3310, 4130, 4140, 4142, 4145, 4150, 4320, 4340, 4620, 4820, 8620, 8622, 8630, 8822, 9310, A182F11, A182F22, A182F91, A336F1, A336F22A, A350LF2, A350LF3, MIL-S 23284C1, MIL-S 23284CL2, H-13, INCONEL® 625, SA182

### BEARING QUALITY

4130, 4140, 4320, 4340, 4820, 8620, 8822, 8825, 52100

### AIRCRAFT QUALITY

4130 (AMS 6348), 4140 (AMS 6382), 4320 (AMS 2301), 4330V (AMS 6427), 4340 (AMS 2301), 4340 (AMS 6415), 4340 (AMS-S 5000), 4820 (AMS 2301), 9310 (AMS 6260), 9315 (AMS 6263), 17-22-AS (AMS 6302)

### CALCIUM TREATED

4130, 4140, 4150, 4340, 8620

### VAR MATERIAL

4320 (AMS 2300), 4330 (AMS 6411), 4340 (AMS 6414), 9310 (AMS 6265), PYROWEAR® 53 (AMS 6308), NITRALLOY N (AMS 6475), 9-4-30 (AMS 6526), PYROWEAR® 675

### VIM VAR IUT

H12 MOD. (BMS 7-223), 9310 (BMS 7-249), 4340 (BMS 7-250), LESCO® 53, PYROWEAR® 53 (HMS 6-1288)

### STAINLESS STEEL

304, 304L, 316, 316L, 405, 410, 17-4PH, 15-5PH

### CUSTOM GRADES

Caterpillar, General Electric, Westinghouse, Boeing Aerospace

■ The above grades can be ordered to meet acceptable AMS, ASTM, or military specifications as needed. Clifford-Jacobs forges most commercially available variations of these grades.

Clifford-Jacobs takes pride in the speed and accuracy with which we reply to requests for quotes. In addition, we offer short to medium runs, from 25 to 15,000 pieces annually, and we have a seasoned, expert staff with a CNC-equipped die shop on-site. To expedite answers to your questions, please have the following information at hand:

- Material grade
- EAU and delivery quantity
- Date requested
- A good-quality, fully dimensional print

If required, please include any specifications you may have for machining, heat treating, and testing.

Clifford-Jacobs can produce custom or standard forgings within the following parameters:

- From 3 pounds to 800 pounds
- Up to 30 inches in diameter
- Up to 50 inches in length
- Up to 18 inches in spindle height
- Annual quantity of 25 to 15,000 pieces

### CLIFFORD-JACOBS FORGING

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