

# Metal Fastenings

Part	Qty	Stock	1/2 x 1/8	3 1/2 x 1/8	6 x 1/8	Total holes	Banks
A	44	6 x 1/8	8			44	352
B	16	3 1/2 x 1/8	6	16			96
C	28	6 x 1/8	10			28	280
D	8	6 x 1/8	6			8	48 16
E	8	1 1/2 x 1/8	3	5.66			24 4
F	12	1 1/2 x 1/8	4	12			48 12
G	4	6 x 1/8	5			3	20 4
H	4	6 x 1/8	5			3	20 4
I	24	3 1/2 x 1/8	5	21			120 24
J	12	3 1/2 x 1/8	6	12			72 24
K	12	3 1/2 x 1/8	6	15			72 24
L	4	3 1/2 x 1/8	6	4			24 8
M	4	3 1/2 x 1/8	6	4.3			24 8
N	12	6 x 1/8	4			7	48
O	16	3 1/2 x 1/8	4	7			64
P	24	3 1/2 x 1/8	5	22			120
Q	4	6 x 1/8	6			3.3	24
R	2	6 x 1/8	8			2	76
S	4	1 1/2 x 1/8	3	3			12
T	4	6 x 1/8	2			4	8
U	4	6 x 1/8	16			30	64 8
	250						1286 136

20 131 102  
101 132

Drill holes 17/32" dia for 1/32" clearance.

20 ft 2x4 weigh 25 lbs each  
= 1.25 #/ft.

average of 5 = 125 lbs.

$$1\frac{5}{8} \times 3\frac{5}{8} \times 12 \times 20 = 1418 \text{ cu in} = .819 \text{ cu ft} = 30.5 \text{ #/cu ft}$$

6 Parts A weigh 54 lbs  
average 9 lbs each.

$$.5 \times .5 = .2500 \text{ sq"}$$

$$.25 \times .25 = .0625$$

$$.0625 \times 785 = .048 \text{ sq"}$$

$$.2500 - .048 = .202 \text{ sq"}$$

$$\frac{140 \text{ # safe load}}{.202 \text{ sq"}} = 700 \text{ #/sq"} \text{ across grain}$$

$$.25 \times .25 = .0625$$

$$.125 \times .125 \times 785 = .0125$$

$$.0625 - .0125 = .050 \text{ sq"}$$

$$\frac{140 \text{ # safe load}}{.050 \text{ sq"}} = 2800 \text{ #/sq"} \text{ with grain}$$

2 1/2" x 1/4" bolts .055 #/bolt

72	2	144
18	1	18
18	2	36
		<hr/>
	mirror support	198

1 1/4" x 1/4" bolts .0275 #/bolt

72	2	144
18	1	18
		<hr/>
	mirror support	162

1/4" Washers .005 #/washer

198 + 162 + 18 mirror support	378
128 + 16 focus support	144

1 1/4" x 1/4" bolts

4	32	128
	focus support	

2 1/2" x 1/4" bolts

4	4	16
	focus support	

#6 x 1/4" flat head brass machine bolts .22 #/hundred for nuts  
 .158 # " " bolts  
 .378 # " " combination  
 36 x 11 + 9 x 7 for mirror mounting

457

#8 x 3/4" flat head brass wood screws .272 #/hundred  
 72 x 11 + 12 x 7 for mirror mounting

918

3/16" x 3/4" flat wire = .4731 #/ft

72 lengths	2 1/2 ft long	} = 307 ft x .4731 = 147 #
72 "	1 1/2 " "	
18 "	1/2 " "	

2 1/2" bolts

BIRDEN MANUFACTURING COMPANY

Type Part	Number	Bolts	
A	20	4	80
B	10	2	20
	4	6	24
C	10	4	40
D	2	8	16
E	2	14	28
F	2	4	8
G	4	2	8
N	4	6	24
Q	4	2	8
R	4	4	16
T	4	6	24
U	2	4	8
W	4	2	8



Mr. Grote Paper  
225 W. Wesley St.  
Wheaton, Ill.

weight of 50 = 11 lbs.  
= .22 lbs/bolt.

Purchased  
Nuts

312  
200  
50

3" bolts

B	10	4	40
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weight of 50 = 12 lbs. = .24 lbs/bolt

Purchased

100

4 1/2" bolts

TINSELY LABORATORIES

Type Number



D	2	8	16
E	2	2	4
G	4	2	8
H	4	4	16
I	8	4	32
J	8	4	32
K	4	4	32
L	4	8	32
M	6	4	24
N	4	8	32
O	6	6	36
P	12	3	36
Q	4	2	8
S	4	4	16
V	4	2	8
			<b>Total</b> 332

weight of 50 = 17 lbs & .34 lbs/bolt

Purchased 200  
Needed 150

1/2" washers .04/washer

E	2	2	4
F	2	2	4
G	4	2	8
K	8	2	16
O	4	2	8
S	4	2	8
			<b>Total</b> 56