



Magnetic Products, Inc.  
Highland, Michigan | mpimagnet.com

# Workload Limit Table Instructions

## Instructions for the Workload Limit Table for Plates and Rounds

1. Select your MPI Lifting Magnet model.
2. Select the surface finish and condition (clean and smooth, rusty or hot, irregular or rough) that corresponds to your plate or round bar. If your surface roughness exceeds the maximum, do not make the lift.

### Plates:

- a. Select the plate thickness from the table. If your plate thickness is not listed, select the next lower value from the table. Never lift plates thinner than the minimum listed in the table.
- b. Check that the plate you are attempting to lift is shorter than the maximum length (L) and narrower than the maximum width (W) listed in the table under the heading "Max. dimensions" for the thickness of the selected plate.

### Round bars:

- a. Be sure the diameter of the bar is between the minimum and maximum diameter as listed in the table. Never lift bars outside this range.
  - b. Ensure that the bar is less than the maximum length (L) max listed in the table.
3. Determine the maximum safe lifting capacity of the magnet based on your material thickness.

### Plates:

- a. Select the maximum safe lifting value from the table for the minimum length (L) and minimum width (W) from one of the two choices. Do not make the lift if your plate is less than these minimum values.

### Round bars:

- a. The maximum safe lifting value is shown in the table.

4. If you are not lifting AISI 1020 steel, determine the reduction in safe lifting capacity by the percentage factor for your material from the Material Reduction Factor Table shown below. For example, if you are lifting cast iron, multiply the maximum safe lifting capacity determined in Step 3 above for steel by 45% to get the maximum safe lifting capacity for your lift of cast iron.
5. Finally, determine the weight of the plate or round bar you are attempting to lift to be sure it is less than the maximum safe lifting capacity determined in Step 4. The weight can be calculated using the density of 0.283 lbs per cubic inch for steel or by use of a commonly available on-line weight calculator.

## Material Reduction Factor Table

The Workload Limit Table for Conditions and Finishes is for AISI 1020 steel. Other materials are less magnetic. Any increase in alloy content will reduce the safe lifting capacity of the magnet. Use these percentage factors for materials other than AISI 1020 steel:

Material	Percentage Factor
Cast Steel	90%
3% Silicon Steel	80%
AISI 1095 Steel	70%
416 Stainless Steel	50%
Cast Iron (non-chilled)	45%
Pure Nickel	10%

Never attempt to lift non-magnetic metals like 304/316 stainless, aluminum, copper, lead, tin, titanium and zinc, and alloys such as brass and bronze.



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## WORKLOAD LIMIT FOR PLATES AND ROUNDS (AISI 1020 STEEL)\*

LM-0150-REN						
Type of Surface						
Load Thickness	Clean and Smooth Ground Surface Air Gap <0.004 IN		Rusty and Hot Rolled Surface Air Gap 0.004 - 0.012 IN		Irregular and Rough Surface Air Gap 0.012 - 0.02 IN	
	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
0.984	330	-	187	-	132	-
0.59	287	79 x 20	154	430 x 20	121	35 x 20
0.393	265	98 x 20	143	59 x 20	110	47 x 20
0.157	110	98 x 20	88	91 x 20	66	67 x 20
0.078	44	59 x 20	31	51 x 20	29	47 x 20
Round Diameter (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
2 to 4	143	98	110	79	77	59

LM-0300-REN						
Type of Surface						
Load Thickness	Clean and Smooth Ground Surface Air Gap <0.004 IN		Rusty and Hot Rolled Surface Air Gap 0.004 - 0.012 IN		Irregular and Rough Surface Air Gap 0.012 - 0.02 IN	
	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
>= 1.18	661	-	419	-	254	-
0.59	540	78 x 39	353	55 x 39	232	39 x 39
0.393	441	98 x 39	287	59 x 39	209	47 x 39
0.236	220	86 x 39	198	70 x 39	154	59 x 39
0.157	121	70 x 39	110	70 x 39	88	51 x 39
Round Diameter (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
2.4 to 7.875	331	138	265	118	165	98

**DO NOT LIFT PLATES THINNER THAN INDICATED IN THE CHART. WHEN LIFTING TUBES WITH A THIN WALL, THE LENGTH MAY BE THE LIMITING FACTOR.**

\*WLL= maximum working load designed for certain lifting magnet capacity, with respect to minimal safety factor 3:1.



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## WORKLOAD LIMIT FOR PLATES AND ROUNDS (AISI 1020 STEEL)\*

LM-0600-REN						
Type of Surface						
Load Thickness	Clean and Smooth Ground Surface Air Gap <0.004 IN		Rusty and Hot Rolled Surface Air Gap 0.004 - 0.012 IN		Irregular and Rough Surface Air Gap 0.012 - 0.02 IN	
	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
>= 1.18	1322	-	948	-	595	-
0.787	1025	78 x 59	860	78 x 49	551	49 x 39
0.59	948	88 x 59	750	90 x 49	485	70 x 39
0.393	628	98 x 59	529	94 x 49	408	86 x 39
0.315	496	94 x 59	397	90 x 49	287	78 x 39
0.236	342	86 x 59	265	78 x 49	220	78 x 39
Round Diameter (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
2.5 to 10.625	661	157	529	138	352	118

LM-1000-REN						
Type of Surface						
Load Thickness	Clean and Smooth Ground Surface Air Gap <0.004 IN		Rusty and Hot Rolled Surface Air Gap 0.004 - 0.012 IN		Irregular and Rough Surface Air Gap 0.012 - 0.02 IN	
	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
>= 2.36	2204	-	1863	-	1433	-
1.18	1896	96 x 59	1609	78 x 59	1246	75 x 49
0.984	1830	112 x 59	1554	94 x 59	1212	88 x 49
0.787	1642	126 x 59	1411	108 x 59	1124	102 x 49
0.59	1102	130 x 59	981	114 x 59	838	110 x 49
0.393	584	108 x 59	529	100 x 59	441	104 x 49
Round Diameter (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
3.9 to 11.8	1102	177	882	157	661	137

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## WORKLOAD LIMIT FOR PLATES AND ROUNDS (AISI 1020 STEEL)\*

LM-1500-REN						
Type of Surface						
Load Thickness	Clean and Smooth Ground Surface Air Gap <0.004 IN		Rusty and Hot Rolled Surface Air Gap 0.004 - 0.012 IN		Irregular and Rough Surface Air Gap 0.012 - 0.02 IN	
	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
>= 3.15	3306	-	3131	-	2249	-
1.96	3219	118 x 47	2646	98 x 47	2116	78 x 47
1.18	2161	137 x 47	1984	128 x 47	1720	98 x 51
0.787	1676	138 x 55	1653	118 x 63	1532	98 x 69
0.59	1191	118 x 59	1168	118 x 59	926	98 x 55
Round Diameter (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
5.9 to 13.8	1653	197	1543	177	1323	138

LM-2000-REN						
Type of Surface						
Load Thickness	Clean and Smooth Ground Surface Air Gap <0.004 IN		Rusty and Hot Rolled Surface Air Gap 0.004 - 0.012 IN		Irregular and Rough Surface Air Gap 0.012 - 0.02 IN	
	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
>= 3.15	4409	-	3638	-	2866	-
1.96	4299	128 x 59	3527	98 x 59	2756	78x 59
1.18	2976	138 x 59	2535	128 x 59	2205	98, x 59
0.787	2425	138 x 79	2205	118 x 79	1984	98 x 79
0.59	1433	118 x 59	1323	118 x 59	1212	78 x 59
Round Diameter IN	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)	Max. Load (LBS)	Max. Length (IN)
5.9 to 13.8	2204	197	1984	177	1764	157

**DO NOT LIFT PLATES THINNER THAN INDICATED IN THE CHART. WHEN LIFTING TUBES WITH A THIN WALL, THE LENGTH MAY BE THE LIMITING FACTOR.**

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## WORKLOAD LIMIT FOR PLATES (AISI 1020 STEEL)\*

	Material Thickness (IN)	Clean and Smooth Ground Surface Air Gap <0.00394 IN		Rusty and Hot Rolled Surface Air Gap 0.00394 - 0.0118 IN		Irregular and Rough Surface Air Gap 0.0118 - 0.0196 IN		Very Rough Surface Air Gap >0.0196 IN
		Max. Dimensions LxW (IN)	Weight Limits (LBS)	Max. Dimensions LxW (IN)	Weight Limits (LBS)	Max. Dimensions LxW (IN)	Weight Limits (LBS)	
BM-2976	≥1.49	84 x 84	2976	74 x 74	2557	66 x 66	1984	Consult your supplier
	.984	84 x 84	2094	72 x 72	1962	72 x 72	1697	
	.748	84 x 84	1455	72 x 72	1278	72 x 72	1102	
	.511	84 x 84	815	72 x 72	749	59 x 59	573	
	.393	72 x 60	396	59 x 59	352	59 x 59	330	
	.236	48 x 48	198	48 x 48	189	48 x 48	176	
BM-5511	≥1.96	94 x 94	5511	94 x 82	4629	82 x 82	3858	
	1.49	94 x 94	4078	94 x 82	3571	82 x 82	2976	
	.984	94 x 94	2645	94 x 82	2491	82 x 82	2094	
	.748	94 x 82	1763	82 x 82	1543	82 x 70	1345	
	.511	70 x 70	815	70 x 70	793	70 x 70	727	
	.393	70 x 59	551	70 x 59	440	70 x 59	396	
.236	59 x 47	242	59 x 47	220	59 x 47	198		
BM-7936	≥.984	236 x 118	7936	236 x 106	7209	177 x 118	6018	
	.748	260 x 94	5357	236 x 94	4916	177 x 94	4321	
	.511	201 x 94	2755	188 x 94	2601	177 x 94	2403	
	.393	153 x 94	1587	141 x 94	1455	129 x 94	1344	
	.236	141 x 71	749	129 x 70	661	129 x 59	595	
	.118	94 x 71	242	82 x 70	220	70 x 70	198	
BM-11023	≥1.96	141 x 130	11023	130 x 130	9259	118 x 106	7716	
	1.49	130 x 130	8157	129 x 118	7142	118 x 106	5952	
	.984	130 x 130	5291	129 x 118	4982	118 x 106	4188	
	.748	118 x 106	3527	118 x 106	3086	106 x 106	2689	
	.511	106 x 94	1631	106 x 94	1587	94 x 94	1455	
	.393	82 x 82	1102	82 x 82	881	82 x 82	793	
	.236	70 x 70	485	70 x 70	440	70 x 70	396	



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## WORKLOAD LIMIT FOR PLATES AND ROUNDS (AISI 1020 STEEL)\*

	Material Thickness (IN)	Clean and Smooth Ground Surface Air Gap <0.00394 IN		Corroded and Hot Rolled Surface Air Gap 0.00394 - 0.0118 IN		Irregular and Rough Surface Air Gap 0.0118 - 0.0196 IN		Very Rough Surface Air Gap >0.0196 IN
		Max. Dimensions LxW (IN)	Weight Limits (LBS)	Max. Dimensions LxW (IN)	Weight Limits (LBS)	Max. Dimensions LxW (IN)	Weight Limits (LBS)	
BMP-3968	≥1.97	78 x 78	3968	65 x 59	2270	59 x 59	2050	Consult your supplier
	1.49	74 x 74	2491	70 x 59	2050	70 x 59	1873	
	.984	82 x 82	2248	82 x 70	1851	82 x 70	1675	
	.748	94 x 82	1763	82 x 70	1455	82 x 70	1300	
	.511	94 x 82	1256	82 x 82	1036	82 x 70	925	
	.393	82 x 82	859	82 x 70	683	82 x 59	595	
	.236	78 x 78	551	78 x 59	440	70 x 59	330	
BMP-7936	≥2.75	-	7936	-	7495	-	7054	
	1.57	106 x 106	5015	94 x 94	5379	94 x 82	5114	
	1.18	118 x 118	3814	106 x 106	3461	106 x 94	3130	
	.787	118 x 118	2755	106 x 106	2513	106 x 94	2314	
	.590	118 x 118	2028	106 x 106	1851	106 x 94	1719	
	.393	106 x 106	1344	106 x 94	1278	94 x 94	1146	
	.236	118 x 106	815	106 x 94	771	106 x 94	705	
				Diameter (IN)		Weight Limit (LBS)		Max Length (IN)
				BMP-3968	BMP-7936	BMP-3968	BMP-7936	
BMP-3968/7936			Load Type	01.57-017.3	01.77-019.6	2491	4982	236



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## WORKLOAD LIMIT FOR PLATES (AISI 1020 STEEL)\*

Horizontal											
		$\Delta \leq 0.003$ IN			$\Delta = 0.003 - 0.011$ IN			$\Delta = 0.019$ IN			
		S (IN)	L Max. (IN)	W Max. (IN)	Max. Lift (LBS)	L Max. (IN)	W Max. (IN)	Max. Lift (LBS)	L Max. (IN)	W Max. (IN)	Max. Lift (LBS)
PCM -GP250		>0.787	62	39	551	39	27	253	19	19	99
		0.472	78	39	429	59	31	242	39	19	99
		0.393	66	39	308	47	31	165	47	19	99
		0.314	43	39	209	47	31	132	47	19	83
		0.196	59	39	132	39	31	72	47	19	50
		0.118	66	39	88	51	31	55	59	19	41
Vertical											
		$\Delta \leq 0.003$ IN			$\Delta = 0.003 - 0.011$ IN			$\Delta = 0.019$ IN			
		S (IN)	L Max. (IN)	W Max. (IN)	Max. Lift (LBS)	L Max. (IN)	W Max. (IN)	Max. Lift (LBS)	L Max. (IN)	W Max. (IN)	Max. Lift (LBS)
PCM -GP250		> 0.787	39	19	176	19	15	66	15	11	26
		0.472	47	19	132	23	19	61	15	11	24
		0.393	47	19	101	19	19	44	15	11	22
		0.314	39	19	66	19	19	33	15	11	17
		0.196	39	19	39	19	15	17	19	11	13
		0.118	39	19	28	19	19	13	19	15	11

\*WLL= maximum working load designed for certain lifting magnet capacity, with respect to minimal safety factor 4:1.

**DO NOT LIFT PLATES THINNER THAN INDICATED IN THE CHART. WHEN LIFTING TUBES WITH A THIN WALL, THE LENGTH MAY BE THE LIMITING FACTOR.**