

WIRE AND SHEET METAL GAUGES

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MODEL ENGINEER HANDBOOK

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Many users of materials in the form of sheet, strip and wire have encountered difficulties in reconciling the many different standards adopted by manufacturers in Britain and America. This simple conversion table has been compiled with a view to avoiding complications in this respect and enable the various gauges, or at least those most widely used, to be readily compared.

The origin of, and reason for, so many gauges may perhaps be understood in view of the fact that in nearly all cases they originated in widely-separated places, and before really accurate means of engineering measurements were available. At least three different gauges originated in Birmingham, though one of these, the Birmingham Metal Gauge (BMG), once used for sheet brass, is now obsolete, and has been replaced by the Standard Wire Gauge (SWG). Birmingham Wire Gauge (BWG) is sometimes referred to as Stub's Iron Wire Gauge, but this is often confused with Stub's Steel Wire Gauge. Imperial Standard Wire Gauge (SWG) has now superseded the older standards for many purposes, both in Britain and U.S.A.

In view of the bewildering variety of standards in use, and the inconvenience which may be caused by any mistakes in specifying them, it is now common practice, and indeed common sense, to give the actual measurement, in decimal-inch or metric terms, in addition to the gauge number, when ordering materials to which they refer.

The assistance of several British and overseas readers of the *Model Engineer*, in supplying details for the compilation of this table, is gratefully acknowledged.

USES OF GAUGES

BROWN AND SHARPE or AMERICAN WIRE GAUGE. Brass, copper, P.B., aluminium and zinc rods and wire brass, P.B., and aluminium sheets. A separate zinc gauge is used for sheet zinc. B. & S. also used for brazed brass and copper tube (wall thickness).

STUB'S IRON WIRE or BIRMINGHAM WIRE GAUGE (pre-1914). Strip steel, steel hoops and bands, sheet spring steel and sheet copper. Also for wall thickness of seamless brass, copper, aluminium and steel tube.

WASHBURN AND MEON or STEEL WIRE GAUGE (also American Steel & Wire Co., National Wire Gauge and Roebling). Bare steel and iron wire and spring steel wire (not music wire).

AMERICAN STEEL AND WIRE CO'S MUSIC WIRE GAUGE. Commonly used for music wire but note that there are several other music wire gauges in use by individual makers.

U.S. STANDARD SHEET METAL GAUGE. Iron and steel sheets of all types.

STUB'S STEEL WIRE. Used by some manufacturers for a range of tool steel drill rod and wire in addition to number, letter and fractional sizes.

IMPERIAL STANDARD WIRE GAUGE or S.W.G. Used in Britain for all wire (except music wire), brass and copper and aluminium sheets. Used in U.S.A. for copper telephone wire.

BIRMINGHAM GAUGE (1914) or B.G. Used in Britain for iron and steel sheets and hoops.

ENGLISH MUSIC WIRE GAUGE. Oddly enough this one is used exactly as its title suggests.

There are always exceptions to the above rules where a particular industry will adopt a gauge for a material not normally found in that gauge. This is getting to be a far cry from model engineering but if you can use this information once or twice in the next ten years the effort will have been worthwhile.

Gauge No.	Brown & Sharpe	Washburn & Meon	Stub's Iron Wire (B.W.G.)	U.S. Standard Sheet	Stub's Steel Wire	Imperial Standard Wire Gauge (S.W.G.)	Birmingham Gauge for Sheets	American Steel & Wire Co. Music Wire	English Music Wire
0000000	—	0.4900	—			0.500	0.6666	—	
000000	0.5800	0.4615	—			0.464	0.6250	0.004	
00000	0.5165	0.4305	0.500			0.432	0.5883	0.005	
0000	0.4600	0.3938	0.454			0.400	0.5416	0.006	
000	0.4096	0.3625	0.425			0.372	0.5000	0.007	
00	0.3648	0.3310	0.380			0.348	0.4452	0.008	
0	0.3249	0.3065	0.340			0.324	0.3964	0.009	
1	0.2893	0.2830	0.300		0.227	0.300	0.3532	0.010	
2	0.2576	0.2625	0.284		0.219	0.276	0.3147	0.011	0.0105
3	0.2294	0.2437	0.259	0.2391	0.212	0.252	0.2804	0.012	0.0115
4	0.2043	0.2253	0.238	0.2242	0.207	0.232	0.2500	0.013	0.0125
5	0.1819	0.2070	0.220	0.2092	0.204	0.212	0.2225	0.014	0.0145
6	0.1620	0.1920	0.203	0.1943	0.201	0.192	0.1981	0.016	0.0150
7	0.1443	0.1770	0.180	0.1793	0.199	0.176	0.1764	0.018	0.0175
8	0.1285	0.1620	0.165	0.1644	0.197	0.160	0.1570	0.020	0.0190
9	0.1144	0.1483	0.148	0.1495	0.194	0.144	0.1398	0.022	0.0220
10	0.1019	0.1350	0.134	0.1345	0.191	0.128	0.1250	0.024	0.0245
11	0.0907	0.1205	0.120	0.1196	0.188	0.116	0.1113	0.026	0.0270

(Continued overleaf)

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Gauge No.	Brown & Sharpe	Washburn & Meon	Stub's Iron Wire (B.W.G.)	U.S. Standard Sheet	Stub's Steel Wire	Imperial Std. Wire Gauge (S.W.G.)	Birmingham Gauge for Sheets	American & Wire Co. Music Wire	English Music Wire
12	0-0808	0-1055	0-109	0-1046	0-185	0-104	0-0991	0-029	0-0285
13	0-0720	0-0915	0-095	0-0897	0-182	0-092	0-0882	0-031	0-0305
14	0-0641	0-0800	0-083	0-0747	0-180	0-080	0-0785	0-033	0-0320
15	0-0571	0-0720	0-072	0-0673	0-178	0-072	0-0699	0-035	0-0350
16	0-0508	0-0625	0-065	0-0598	0-175	0-064	0-0625	0-037	0-0360
17	0-0453	0-0540	0-058	0-0538	0-172	0-056	0-0556	0-039	0-0380
18	0-0403	0-0475	0-049	0-0478	0-168	0-048	0-0495	0-041	0-0400
19	0-0359	0-0410	0-042	0-0418	0-164	0-040	0-0440	0-043	0-0420
20	0-0320	0-0348	0-035	0-0359	0-161	0-036	0-0392	0-045	0-0430
21	0-0285	0-0317	0-032	0-0329	0-157	0-032	0-0349	0-047	0-0445
22	0-0253	0-0286	0-028	0-0299	0-155	0-028	0-0312	0-049	0-0470
23	0-0226	0-0258	0-025	0-0269	0-153	0-024	0-0278	0-051	0-0490
24	0-0201	0-0230	0-022	0-0239	0-151	0-022	0-0247	0-055	0-0530
25	0-0179	0-0204	0-020	0-0209	0-148	0-020	0-0220	0-059	0-0560
26	0-0159	0-0181	0-018	0-0179	0-146	0-018	0-0196	0-063	0-0605
27	0-0142	0-0173	0-016	0-0164	0-143	0-0164	0-0174	0-067	0-0640
28	0-0126	0-0162	0-014	0-0149	0-139	0-0148	0-0156	0-071	0-0685
29	0-0113	0-0150	0-013	0-0135	0-134	0-0136	0-0139	0-075	0-0715

30	0-0100	0-0140	0-012	0-0120	0-127	0-0124	0-0123	0-080	0-0750
31	0-0089	0-0132	0-010	0-0105	0-120	0-0116	0-0110	0-085	
32	0-0080	0-0128	0-009	0-0097	0-115	0-0108	0-0098	0-090	
33	0-0071	0-0118	0-008	0-0090	0-112	0-0100	0-0087	0-095	
34	0-0063	0-0104	0-007	0-0082	0-110	0-0092	0-0077	0-100	
35	0-0056	0-0095	0-005	0-0075	0-108	0-0084	0-0069	0-106	
36	0-0050	0-0090	0-004	0-0067	0-106	0-0076	0-0061	0-112	
37	0-0045	0-0085		0-0064	0-103	0-0068	0-0054	0-118	
38	0-0040	0-0080		0-0060	0-101	0-0060	0-0048	0-124	
39	0-0035	0-0075			0-099	0-0052	0-0043	0-130	
40	0-0031	0-0070			0-097	0-0048	0-0038	0-138	
41	0-0028	0-0066			0-095	0-0044	0-0034	0-146	
42	0-0025	0-0062			0-092	0-0040	0-0030	0-159	
43	0-0022	0-0060			0-088	0-0036	0-0027	0-162	
44	0-00198	0-0058			0-085	0-0032	0-0024	0-170	
45	0-00176	0-0055			0-081	0-0028	0-0021	0-180	
46	0-00157	0-0052			0-079	0-0024	0-0019		
47	0-00140	0-0050			0-077	0-0020	0-0017		
48	0-00124	0-0048			0-075	0-0016	0-0015		
49	0-00099	0-0046			0-072	0-0012	0-0013		
50	0-00088	0-0044			0-069	0-0010	0-0012		