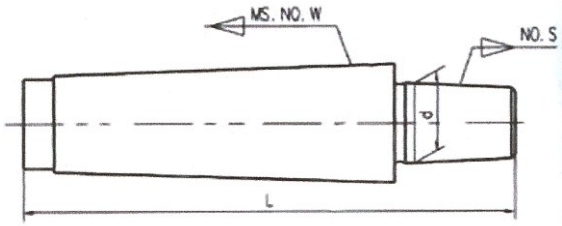
Data Sheet: LDS 1034 Date: 06-02-2012

Morse Taper to Jacobs Taper

The JTMT range of Drill Chuck Arbors provide for connection of machine spindles with Morse Tapers to Drill Chucks with a Jacobs Taper fitting



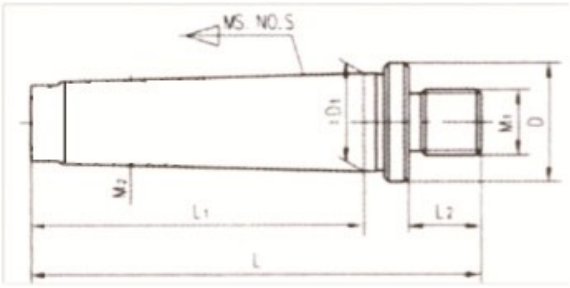
Code	MT	JT	D1	D2	L
JTMT-101	1	1	9.754	8.47	76
JTMT-201	2	1	9.754	12.39	88
JTMT-301	3	1	9.754	18.95	105
JTMT-102	1	2	14.199	8.47	82
JTMT-202	2	2	14.199	12.39	94
JTMT-302	3	2	14.199	18.95	111
JTMT-402	4	2	14.199	26.24	134
JTMT-103	1	3	20.599	8.47	91
JTMT-203	2	3	20.599	12.39	103
JTMT-303	3	3	20.599	18.95	120
JTMT-403	4	3	20.599	26.24	143
JTMT-204	2	4	28.550	12.39	114
JTMT-304	3	4	28.550	18.95	131
JTMT-404	4	4	28.550	26.24	154
JTMT-305	3	5	35.890	18.95	136
JTMT-405	4	5	35.890	26.24	159
JTMT-505	5	5	35.890	33.43	186
JTMT-106	1	6	17.170	8.47	85
JTMT-206	2	6	17.170	12.39	97
JTMT-306	3	6	17.170	18.95	114
JTMT-406	4	6	17.170	26.24	137
JTMT-133	1	33	15.850	8.47	85
JTMT-233	2	33	15.850	12.39	97
JTMT-333	3	33	15.850	18.95	114
JTMT-433	4	33	15.850	26.24	137

Packed Weight and Dimensions

Code	MT	JT	Weight g	W mm	H mm	L mm
JTMT-101	1	1	62	20	20	95
JTMT-201	2	1	139	24	24	107
JTMT-301	3	1	283	26	26	126
JTMT-102	1	2	83	24	24	100
JTMT-202	2	2	159	24	24	114
JTMT-302	3	2	310	31	31	135
JTMT-402	4	2	624	34	34	160
JTMT-103	1	3	142	24	24	108
JTMT-203	2	3	223	24	24	124
JTMT-303	3	3	371	29	29	146
JTMT-403	4	3	694	38	38	168
JTMT-204	2	4	361	36	36	136
JTMT-304	3	4	514	31	31	157
JTMT-404	4	4	830	36	36	178
JTMT-305	3	5	750	38	38	178
JTMT-405	4	5	975	38	38	178
JTMT-505	5	5	1960	51	51	240
JTMT-106	1	6	104	20	20	104
JTMT-206	2	6	180	24	24	124
JTMT-306	3	6	331	29	29	140
JTMT-406	4	6	659	36	36	168
JTMT-133	1	33	99	24	24	102
JTMT-233	2	33	175	23	23	118
JTMT-333	3	33	324	28	28	136
JTMT-433	4	33	647	36	36	169

Morse Taper to Threaded End

The JTTA range of Drill Chuck Arbors provide for connection of machine spindles with Morse Tapers to Drill Chucks with a Threaded fitting



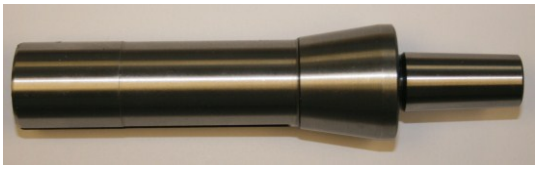
Code	MT	M1	D	L	L1	L2	D1
JTTA-124	1	3/8-24	16	81	62	11.5	12.065
JTTA-224	2	3/8-24	N/A*	91.5	75	11.5	17.780
JTTA-220	2	½-20	22	97	75	13	17.780
JTTA-216	2	5/8-16	28	101	75	16	17.780
JTTA-316	3	5/8-16	28	120	94	16	23.825
JTTA-324	3	3/8-24	N/A*	110.5	94	11.5	23.825
JTTA-320	3	½-20	N/A*	112	94	13	23.825

*N/A in the above table indicates that the Arbor does not have a flange and is without the “D” dimension
The flange is provided on arbors where the large end of the Morse Taper is not large enough to provide a good seat for the chuck face

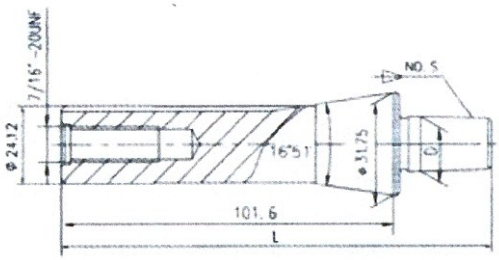
Packed Weight and Dimensions

Code	MT	M1	Weight g	W mm	H mm	L mm
JTTA-124	1	3/8-24	65	25	25	85
JTTA-224	2	3/8-24	130	25	25	88
JTTA-220	2	½-20	149	25	25	102
JTTA-216	2	5/8-16	183	30	30	110
JTTA-316	3	5/8-16	304	33	33	170
JTTA-324	3	3/8-24	274	25	25	114
JTTA-320	3	½-20	286	30	30	117

Bridgeport R8 to Jacobs Taper



The R8JT range of Drill Chuck Arbors provide for connection of machine spindles with Bridgeport R8 Tapers to Drill Chucks with a Jacobs Taper fitting

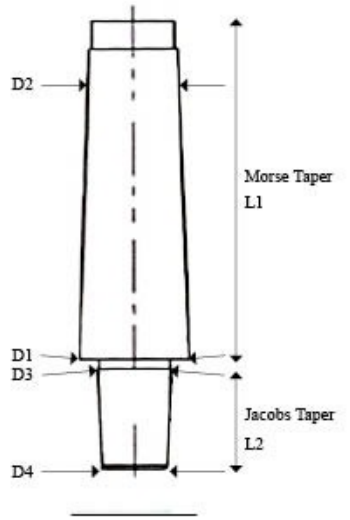


Code	Bridgeport	Jacobs	D	L
R8-2JT	R8	2	14.199	128
R8-3JT	R8	3	20.599	137
R8-6JT	R8	6	17.170	132
R8-33JT	R8	33	15.850	132

Packed Weight and Dimensions

Code	Bridgeport	Jacobs	Weight g	W mm	H mm	L mm
R8-2JT	R8	2	420	35	35	140
R8-3JT	R8	3	475	30	30	150
R8-6JT	R8	6	430	38	38	140
R8-33JT	R8	33	450	35	35	145

Identifying Tapers



Morse Taper Shank

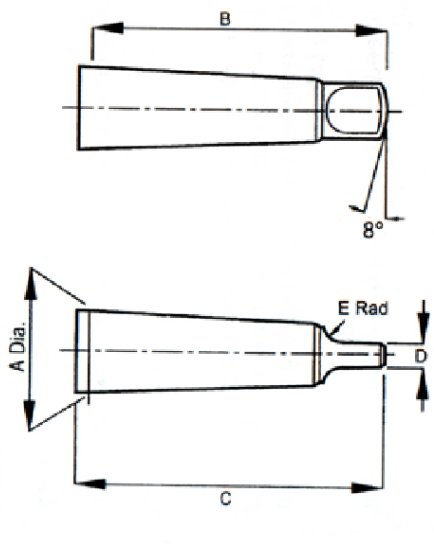
MT No.	D1	D2	L1
1	12.06	9.70	66
2	17.78	14.90	80
3	23.82	20.20	99
4	31.27	26.50	124
5	44.40	38.20	156
6	63.35	54.60	218

Jacobs Tapers

JT No.	D3	D4	L2
0	6.35	5.80	11.1
1	9.75	8.47	16.7
2	14.20	12.39	22.2
33	15.85	14.24	25.4
6	17.17	15.85	25.4
3	20.60	18.95	30.9
4	28.55	26.37	42.1
5	35.89	33.42	47.6

Morse Taper Dimensions

Principal dimensions of Morse Taper Shank in accordance with BS1660, 1972 / ISO 296/DIN 228



MORSE TAPER No.	A mm	B mm	C mm	D mm	E mm	TAPER per mm on dia.
1	12.065	62.0	65.5	5.2	5	0.04988
2	17.780	75.0	80.0	6.3	6	0.04995
3	23.825	94.0	99.0	7.9	7	0.05020
4	31.267	117.5	124.0	11.9	8	0.05194
5	44.399	149.5	156.0	15.9	10	0.05263

Morse Taper Information

The Morse Taper was invented by Stephen A. Morse in the mid-1860s.Since then, it has evolved to encompass smaller and larger sizes and has been adopted as a standard by numerous organizations, including the International Organization for Standardization (ISO) as ISO 296 and the German Institute for Standardization (DIN) as DIN 228-1. It is one of the most widely used types, and is particularly common on the shank of taper-shank twist drills and machine reamers, in the spindles of industrial drill presses, and in the tailstocks of lathes.

Sizes

Morse Tapers come in eight sizes identified by whole numbers between 0 and 7, and one half-size (4 1/2 - very rarely found, and not shown in the table). Often the designation is abbreviated as MT followed by a digit, for example a Morse taper number 4 would be MT4. The MT2 taper is the size most often found in drill presses up to ½" capacity. Stub (short) versions, the same taper angle but a little over half the usual length, are occasionally encountered for the whole number sizes from 1 through 5. There are standards for these, which (inter alia) are sometimes used in lathe headstocks to preserve a larger spindle through-hole.

End types

Morse tapers are of the self-holding variety, and can have three types of ends:

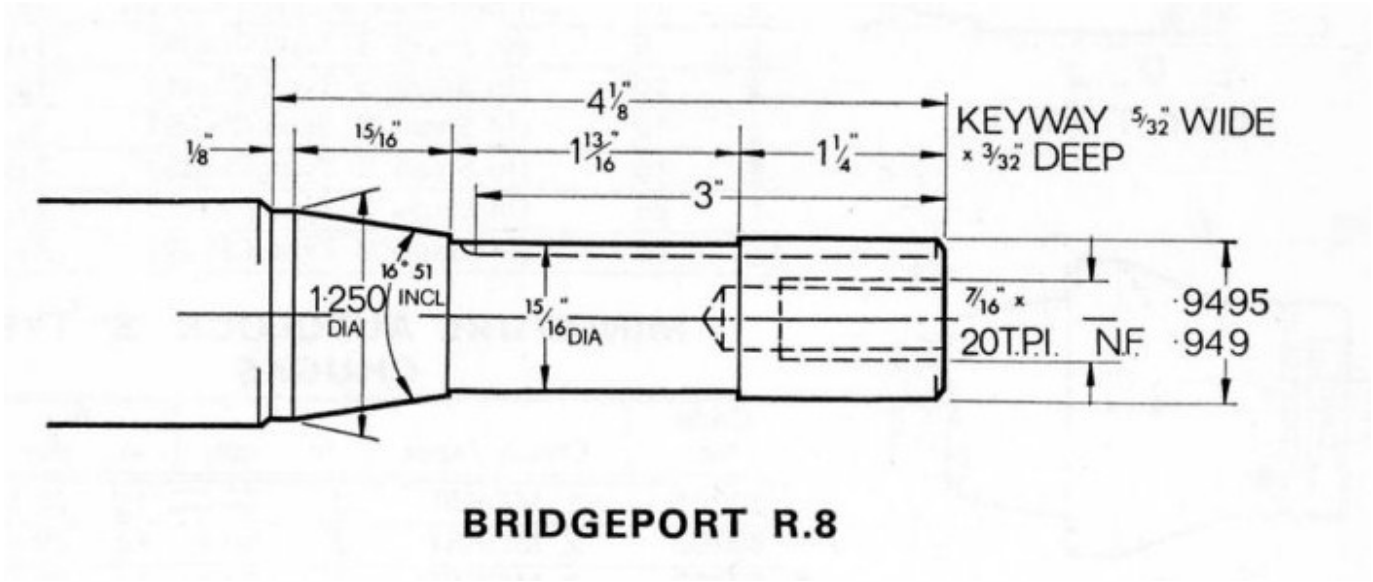
- tang (illustrated) to facilitate removal with a drift
- threaded to be held in place with a drawbar
- flat (no tang or threaded section)

Self holding tapers rely on a heavy preponderance of axial load over radial load to transmit high torques. Problems may arise using large drills in relation to the shank, if the pilot hole is too large. The threaded style is essential for any side loading, particularly milling. The only exception is that such unfavorable situations can be simulated to remove a jammed shank. Permitting chatter will help release the grip. The acute (narrow) taper angle can result in such jamming with heavy axial loads, or over long periods.

End-Milling cutters with a Morse taper shank with a tang are occasionally seen: for security these must be used with a C-collar or similar, fitting into the neck between cutter and shank, and pulling back against the large end of the taper

The taper itself is roughly 5/8" per foot, but exact ratios and dimensions for the various sizes of tang type tapers are given below.

Bridgeport R8



This taper was designed by Bridgeport Machines Inc. for use in their milling machines. It is used with a drawbar extending up through the spindle to the top of the machine to prevent the collet from falling from the spindle when lateral forces are encountered. The collet, which is inserted into the taper, has a precision hole in one end for holding a cutting tool and is threaded for a drawbar on other end. They are also keyed (see image) to prevent rotation during insertion and removal. However, cutting torques are transferred through friction at the taper, not through the key. The drawbar thread is typically 7/16"-20tpi (UNF).

The cutting tool is placed in the collet, the collet placed into the taper, and the drawbar is tightened into the top of the collet from above the spindle. The collet has a groove to engage a key in the spindle to keep the collet from spinning inside the taper and to aid in the installation and removal of the collet. The angle of the cone is typically 16 degrees and 51 minutes (i.e. 16.85 degrees) with an OD of 1.25" (source, Bridgeport Manufacturer).