

Cutting Tools

CARBIDE HELICAL END MILL WITH WHISTLE SHANK K30 MATERIAL



DIN 1835/1-1986

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	3	243-0400
20	20	38	104	2	3	243-0402
25	25	45	121	2	4	243-0404
32	32	53	133	2	5	243-0406
40	40	63	155	2	6	243-0408
50	50	75	177	2	6	243-0410

ANSI B94.19-1985

D	d	5/ l	L	Z	Rmax	Model No.
8	5/8	1-1/4	3-5/8	2	1/8	243-1400
3/4	3/4	1-1/2	4-1/8	2	1/8	243-1402
1	1	1-3/4	4-3/4	2	5/32	243-1404
1-1/4	1-1/4	2-1/8	5-1/4	2	13/64	243-1406
1-1/2	1-1/2	2-1/2	6-1/8	2	15/64	243-1408
2	2	3	7	2	15/64	243-1410

CENTER CUTTING CARBIDE HELICAL END MILL WITH WHISTLE SHANK K30 MATERIAL



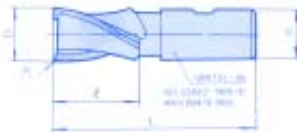
DIN 1835/1-1986

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	3	243-0412
20	20	38	104	2	3	243-0414
25	25	45	121	2	4	243-0416
32	32	53	133	2	5	243-0418
40	40	63	155	2	6	243-0420
50	50	75	177	2	6	243-0422

ANSI B94.19-1985

D	d	5/ l	L	Z	Rmax	Model No.
8	5/8	1-1/4	3-5/8	2	1/8	243-1412
3/4	3/4	1-1/2	4-1/8	2	1/8	243-1414
1	1	1-3/4	4-3/4	2	5/32	243-1416
1-1/4	1-1/4	2-1/8	5-1/4	2	13/64	243-1418
1-1/2	1-1/2	2-1/2	6-1/8	2	15/64	243-1420
2	2	3	7	2	15/64	243-1422

CARBIDE HELICAL END MILL WITH WELDON SHANK(FLATTED PARALLEL SHANK)K30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	3	243-0450
20	20	38	104	2	3	243-0452

ANSI B94.19-1985

D	d	l	L	Z	Rmax	Model No.
5/8	5/8	1-1/4	3-5/8	2	1/8	243-1450
3/4	3/4	1-1/2	4-1/8	2	1/8	243-1452

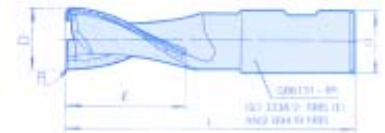
ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
25	25	45	121	2	4	243-0454
32	32	53	133	2	5	243-0456
40	40	63	155	2	6	243-0458
50	50	75	177	2	6	243-0460

ANSI B94.19-1985

D	d	l	L	Z	Rmax	Model No.
1	1	1-3/4	4-3/4	2	5/32	243-1454
1-1/4	1-1/4	2-1/8	5-1/4	2	13/64	243-1456
1-1/2	1-1/2	2-1/2	6-1/8	2	15/64	243-1458
2	2	3	7	2	15/64	243-1460

CENTER CUTTING CARBIDE HELICAL END MILL WITH WELDON SHANK (FLATTED PARALLEL SHANK) K30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	3	243-0462
20	20	38	104	2	3	243-0464

ANSI B94.19-1985

D	d	l	L	Z	Rmax	Model No.
5/8	5/8	1-1/4	3-5/8	2	1/8	243-1462
3/4	3/4	1-1/2	4-1/8	2	1/8	243-1464

ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
25	25	45	121	2	4	243-0466
32	32	53	133	2	5	243-0468
40	40	63	155	2	6	243-0470
50	50	75	177	2	6	243-0472

ANSI B94.19-1985

D	d	l	L	Z	Rmax	Model No.
1	1	1-3/4	4-3/4	2	5/32	243-1466
1-1/4	1-1/4	2-1/8	5-1/4	2	13/64	243-1468
1-1/2	1-1/2	2-1/2	6-1/8	2	15/64	243-1470
2	2	3	7	2	15/64	243-1472

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON, TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL	M30
HIGH-TEMPERATURE STEEL	

Cutting Tools



CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK(ISO 296) K30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Rmax	Model No.
16	32	117	2#	2	3	243-1500
18	32	117	2#	2	3	243-1502
20	38	123	2#	2	3	243-1504
22	38	140	3#	2	4	243-1506
25	45	147	3#	2	4	243-1508
28	45	147	3#	2	4	243-1510
32	53	178	4#	2	5	243-1512
36	53	178	4#	2	5	243-1514
40	63	188	4#	2	6	243-1516
45	63	221	5#	2	6	243-1518
50	75	233	5#	2	6	243-1520

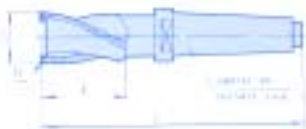
CENTER CUTTING CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK (ISO 296), K30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Rmax	Model No.
16	32	117	2#	2	3	243-1530
18	32	117	2#	2	3	243-1532
20	38	123	2#	2	3	243-1534
22	38	140	3#	2	4	243-1536
25	45	147	3#	2	4	243-1538
28	45	147	3#	2	4	243-1540
32	53	178	4#	2	5	243-1542
36	53	178	4#	2	5	243-1544
40	63	188	4#	2	6	243-1546
45	63	221	5#	2	6	243-1548
50	75	233	5#	2	6	243-1550

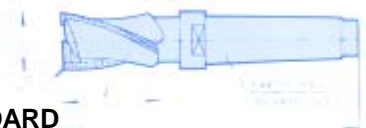
CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR ,K30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Rmax	Model No.
32	53	201	4#	2	5	243-1560
36	53	201	4#	2	5	243-1562
40	63	211	4#	2	6	243-1564
45	63	249	5#	2	6	243-1566
50	75	261	5#	2	6	243-1568

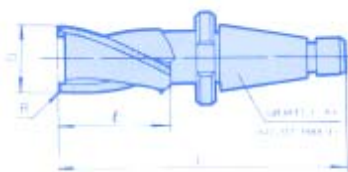
CENTER CUTTING CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR K30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Rmax	Model No.
32	53	201	4#	2	5	243-1570
36	53	201	4#	2	5	243-1572
40	63	211	4#	2	6	243-1574
45	63	249	5#	2	6	243-1576
50	75	261	5#	2	6	243-1578

CARBIDE HELICAL END MILL WITH 7/24TAPER SHANK (ISO297),K30 MATERIAL



ISO STANDARD

D	I	L	ISO	Z	Rmax	Model No.
40	63	198	40#	2	6	243-1580
50	85	252	50#	2	6	243-1582
63	90	267	50#	2	6	243-1584

CENTER CUTTING CARBIDE HELICAL END MILL WITH 7/24TAPER SHANK (ISO297) K30 MATERIAL



ISO STANDARD

D	I	L	ISO	Z	Rmax	Model No.
40	63	198	40#	2	6	243-1590
50	85	252	50#	2	6	243-1592
63	90	267	50#	2	6	243-1594

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY.	
CAST STEEL	M30
HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	

The corner radius R 0.5mm are used for metric cutters, or they shall have the dimensions of 1,1.5,2,3,4,5,6mm on request, the Rmax is given in tables.

The corner radius R 1/64inch are used for imperial cutters, or they shall have the dimensions of 3/64,1/16,5/64,1/8,5/32,13/64,15/64inch on request, the Rmax is given in tables.



Cutting Tools

BALL-NOSED CARBIDE HELICAL END MILL WITH WHISTLE SHANK K30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	8	243-1600
20	20	38	104	2	10	243-1602
25	25	45	121	2	12.5	243-1604
32	32	53	133	2	16	243-1606
40	40	63	155	2	20	243-1608
50	50	75	177	2	25	243-1610

BALL-NOSED CARBIDE HELICAL END MILL WITH WELDON SHANK K30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Rmax	Model No.
16	16	32	92	2	8	243-1620
20	20	38	104	2	10	243-1622
25	25	45	121	2	12.5	243-1624
32	32	53	133	2	16	243-1626
40	40	63	155	2	20	243-1628
50	50	75	177	2	25	243-1630

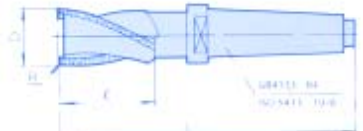
BALL-NOSED CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK K30 MATERIAL



ISO STANDARD

D	l	L	M	Z	Rmax	Model No.
16	32	117	2#	2	8	243-1640
18	32	117	2#	2	9	243-1642
20	38	123	2#	2	10	243-1644
22	38	140	3#	2	11	243-1646
25	45	147	3#	2	12.5	243-1648
28	45	147	3#	2	14	243-1650
32	53	178	4#	2	16	243-1652
36	53	178	4#	2	18	243-1654
40	63	188	4#	2	20	243-1656
45	63	221	5#	2	22.5	243-1658
50	75	233	5#	2	25	243-1660

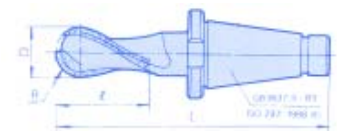
BALL-NOSED CARBIDE END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR K30 MATERIAL



ISO STANDARD

D	l	L	M	Z	Rmax	Model No.
32	53	201	4#	2	16	243-1670
36	53	201	4#	2	18	243-1672
40	63	211	4#	2	20	243-1674
45	63	249	5#	2	22.5	243-1676
50	75	261	5#	2	25	243-1678

BALL-NOSED CARBIDE END MILL WITH 7/24 TAPER SHANK (ISO/R297) K30 MATERIAL



ISO STANDARD

D	l	L	ISO	Z	R	Model No.
40	63	198	40#	2	20	243-1680
50	75	252	50#	2	25	243-1682
63	90	267	50#	2	31.5	243-1684

CARBIDE HELICAL END MILL WITH STRAIGHT SHANK (ISO3338),M30 MATERIAL



ISO STANDARD

D	d	l	L	Z	Model No.
16	16	19	79	3	243-1690
16	16	32	92	3	243-1691
18	16	19	79	3	243-1692
20	20	22	88	3	243-1693
20	20	38	104	3	243-1694
22	20	22	88	3	243-1695
25	25	26	102	3	243-1696
25	25	45	121	3	243-1697
25	25	26	102	4	243-1698
25	25	45	121	4	243-1699

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON, TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30



CARBIDE HELICAL END MILL WITH WELDON SHANK (FLATTED PARALLEL SHANK) (ISO3338)M30 MATERIAL



ISO STANDARD

D	d	l	L	Z	C	Model No.
20	20	38	104	3	0.5	243-2900
25	25	45	121	4	0.5	243-2902
32	32	53	133	4	0.5	243-2904
40	40	63	155	4	0.8	243-2906
50	50	75	177	4	0.8	243-2908
40	40	63	155	6	0.8	243-2910
50	50	75	177	6	0.8	243-2912

ANSI B94.19-1985

D	d	l	L	Z	Rmax	Model No.
3/4	3/4	1-1/2	4-1/8	3	1/64	243-2901
1	1	1-3/4	4-3/4	4	1/64	243-2903
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-2905
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-2907
2	2	3	7	4	1/64	243-2909
1-1/2	1-1/2	2-1/2	6-1/8	6	1/64	243-2911
2	2	3	7	6	1/32	243-2913

CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK M30 MATERIAL



ISO STANDARD

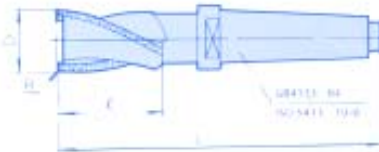
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16	19	104	2#	3	0.5	243-2920
16	32	117	2#	3	0.5	243-2922
18	19	104	2#	3	0.5	243-2924
18	32	117	2#	3	0.5	243-2926
20	22	107	2#	3	0.5	243-1628
20	38	123	2#	3	0.5	243-2930
22	22	124	3#	3	0.5	243-2932
22	38	140	3#	3	0.5	243-2934
25	26	128	3#	3	0.5	243-2936
25	45	147	3#	3	0.5	243-2938
28	26	128	3#	3	0.5	243-2940
25	26	128	3#	4	0.5	243-2942
25	45	147	3#	4	0.5	243-2944
28	26	128	3#	4	0.5	243-2946
28	45	147	3#	4	0.5	243-2948
32	32	157	4#	4	0.5	243-2950
32	53	178	4#	4	0.5	243-2952

ISO STANDARD

D	l	L	M	Z	C	Model No.
36	32	157	4#	4	0.5	243-2921
36	53	178	4#	4	0.5	243-2923
40	38	163	4#	4	0.8	243-2925
40	63	188	4#	4	0.8	243-2927
45	38	163	4#	4	0.8	243-1629
45	38	196	5#	4	0.8	243-2931
50	45	170	4#	4	0.8	243-2933
50	45	203	5#	4	0.8	243-2935
50	75	233	5#	4	0.8	243-2937
40	38	163	4#	6	0.8	243-2939
40	63	188	4#	6	0.8	243-2941
45	38	196	5#	6	0.8	243-2943
45	63	188	4#	6	0.8	243-2945
45	63	221	5#	6	0.8	243-2947
50	45	203	5#	6	0.8	243-2949
50	75	200	4#	6	0.8	243-2951
50	75	233	5#	6	0.8	243-2953

CARBIDE HELICAL END MILL WITH 7/24 TAPER SHANK(ISO/R297) M30 MATERIAL

CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR ,M30 MATERIAL



ISO STANDARD

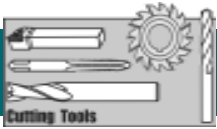
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32	32	180	4#	4	0.5	243-2960
32	53	201	4#	4	0.5	243-2962
36	32	180	4#	4	0.5	243-2964
40	38	186	4#	4	0.8	243-2966
40	63	211	4#	4	0.8	243-1668
45	38	224	5#	4	0.8	243-2970
50	45	231	5#	4	0.8	243-2972
50	75	261	5#	4	0.8	243-2974
40	38	186	4#	6	0.8	243-2976
40	63	211	4#	6	0.8	243-2978
45	38	224	5#	6	0.8	243-2980
50	45	231	5#	6	0.8	243-2982
50	75	261	5#	6	0.8	243-2984

ISO STANDARD

D	D	L	ISO	Z	Model No.
40	63	198	40#	4	243-2990
50	75	252	50#	4	243-2992
40	63	198	40#	6	243-2994
50	75	252	50#	6	243-2996
63	90	267	50#	6	243-2998

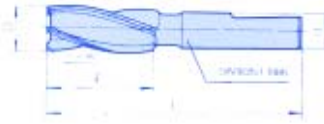
INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30



Cutting Tools

CARBIDE HELICAL END MILL WITH 01° WHISTLE SHANK FLATTED M30 MATERIAL



ANSI STANDARD

DIN STANDARD

D	d	I	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1700
20	20	38	104	3	0.5	243-1702
25	25	45	121	4	0.5	243-1704
32	32	53	133	4	0.5	243-1706
40	40	63	155	4	0.8	243-1708
50	50	75	177	4	0.8	243-1710
40	40	63	155	6	0.8	243-1712
50	50	75	177	6	0.8	243-1714

D	d	I	L	Z	C	Model No.
5/8	5/8	1-1/4	3-5/8	3	1/64	243-1701
3/4	3/4	1-1/2	4-1/8	3	1/64	243-1703
1	1	1-3/4	4-3/4	4	1/64	243-1705
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1707
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1709
2	2	3	7	4	1/32	243-1711
1-1/2	1-1/2	2-1/2	6-1/8	6	1/64	243-1713
2	2	3	7	6	1/32	243-1715

CARBIDE HELICAL END MILL WITH THREADED SHANK ,M30 MATERIAL



DIN STANDARD

D	d	G	I	L	Z	C	Model No.
16	16	20T.P.I.(whit)	32	92	3	0.5	243-1720
18	16	20T.P.I.(whit)	32	92	3	0.5	243-1722
20	20	20T.P.I.(whit)	38	104	3	0.5	243-1724
22	20	20T.P.I.(whit)	38	104	3	0.5	243-1726
25	25	20T.P.I.(whit)	45	121	3	0.5	243-1728
28	25	20T.P.I.(whit)	45	121	3	0.5	243-1730
25	25	20T.P.I.(whit)	45	121	4	0.5	243-1732
28	25	20T.P.I.(whit)	45	121	4	0.5	243-1734
32	32	20T.P.I.(whit)	53	133	4	0.5	243-1736

ANSI STANDARD

D	d	G	I	L	Z	C	Model No.
5/8	5/8	20T.P.I.(whit)	1-1/4	3-1/4	3	0.5	243-1721
3/4	5/8	20T.P.I.(whit)	1-1/2	3-21/32	3	0.5	243-1723
7/8	1	20T.P.I.(whit)	1-1/2	4-3/16	3	0.5	243-1725
1	1	20T.P.I.(whit)	1-3/4	4-5/8	3	0.5	243-1727
1-1/8	1	20T.P.I.(whit)	1-3/4	4-5/8	3	0.5	243-1729
1	1	20T.P.I.(whit)	1-3/4	4-5/8	4	0.5	243-1731
1-1/8	1	20T.P.I.(whit)	1-3/4	4-5/8	4	0.5	243-1733
1-1/4	1-1/4	20T.P.I.(whit)	2-1/8	5	4	0.5	243-1735

FORMED CUTTING EDGE CARBIDE HELICAL END MILL WITH WELDON SHANK(FLATTED PARALLEL SHANK) ,M30 MATERIAL



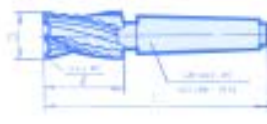
ISO STANDARD

D	d	I	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1740
18	16	32	92	3	0.5	243-1742
20	20	38	104	3	0.5	243-1744
22	20	38	104	3	0.5	243-1746
25	25	45	121	4	0.5	243-1748
28	25	45	121	4	0.5	243-1750
32	32	53	133	4	0.5	243-1752
36	32	53	133	4	0.5	243-1754
40	40	63	155	4	0.8	243-1756
45	40	63	155	4	0.8	243-1758
50	50	75	177	6	0.8	243-1760

ANSI STANDARD

D	d	I	L	Z	C	Model No.
5/8	5/8	1-1/4	3-5/8	3	1/64	243-1741
3/4	3/4	1-1/2	4-1/8	3	1/64	243-1743
7/8	3/4	1-1/2	4-1/8	3	1/64	243-1745
1	1	1-3/4	4-3/4	4	1/64	243-1747
1-1/8	1	1-3/4	4-3/4	4	1/64	243-1749
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1751
1-3/8	1-1/4	2-1/8	5-1/4	4	1/64	243-1753
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1755
1-3/4	1-1/2	2-1/2	6-1/8	4	1/32	243-1757
2	2	3	7	6	1/32	243-1759

CARBIDE HELICAL END MILL WITH COMBINATION SHANK M30 MATERIAL



FORMED CUTTING EDGE CARBIDE HE- LICAL END MILL WITH MORSE TAPER SHANK(ISO 296), M30 MATERIAL

ANSI STANDARD

D	I	L	M	Z	Model No.
25	45	147	3#	4	243-1780
28	45	147	3#	4	243-1782

ANSI STANDARD

D	d	I	L	Z	C	Model No.
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1770
2	2	3	7	6	1/32	243-1772
2-1/2	2-1/2	3-5/8	8	6	1/32	243-1774

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30

Cutting Tools



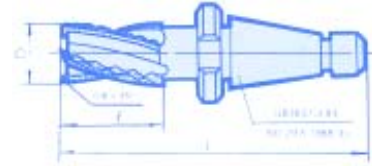
**FORMED CUTTING EDGE CARBIDE
HELICAL END MILL WITH MORSE
TAPER SHANK WITH DRIVING
FLATS ON COLLAR , M30 MATERIAL**



ISO STANDARD

D	I	L	M	Z	C	Model No.
32	53	201	4#	4	0.5	243-1800
36	53	201	4#	4	0.5	243-1802
40	63	211	4#	4	0.8	243-1804
45	63	249	5#	4	0.8	243-1806
50	75	261	5#	6	0.8	243-1808

**FORMED CUTTING EDGE CARBIDE
HELICAL END MILL WITH 7/24 TAPER
SHANK (ISO 297) ,M30 MATERIAL**



ISO STANDARD

D	I	L	ISO	Z	Model No.
40	63	198	40#	4	243-1810
50	75	252	50#	6	243-1812
63	90	267	50#	6	243-1814

**FORMED CUTTING EDGE CARBIDE
HELICAL END MILL OBLIQUE
FLATTED, M30 MATERIAL**



DIN STANDARD

D	d	I	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1820
20	20	38	104	3	0.5	243-1822
25	25	45	121	4	0.5	243-1824
28	25	45	121	4	0.5	243-1826
32	32	53	133	4	0.5	243-1828
36	32	53	133	4	0.5	243-1830
40	40	63	155	4	0.8	243-1832
45	40	63	155	4	0.8	243-1834
50	50	75	177	6	0.8	243-1836

ANSI STANDARD

D	d	I	L	Z	C	Model No.
5/8	5/8	1-1/4	3-5/8	3	1/64	243-1821
3/4	3/4	1-1/2	4-1/8	3	1/64	243-1823
1	1	1-3/4	4-3/4	4	1/64	243-1825
1-1/8	1	1-3/4	4-3/4	4	1/64	243-1827
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1829
1-3/8	1-1/4	2-1/8	5-1/4	4	1/64	243-1831
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1833
1-3/4	1-1/2	2-1/2	6-1/8	4	1/32	243-1835
2	2	3	7	6	1/32	243-1837

**FORMED CUTTING EDGE
CARBIDE HELICAL END
MILL WITH STRAIGHT
SHANK , M30 MATERIAL**



ISO STANDARD

D	d	I	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1840
18	16	32	92	3	0.5	243-1842
20	20	38	104	3	0.5	243-1844
22	20	38	104	3	0.5	243-1846
25	25	45	121	4	0.5	243-1848
28	25	45	121	4	0.5	243-1850

D	d	I	L	Z	C	Model No.
32	32	53	133	4	0.5	243-1852
36	32	53	133	4	0.8	243-1854
40	40	63	155	4	0.8	243-1856
45	40	63	155	4	0.8	243-1858
50	50	75	177	6	0.8	243-1860

**FORMED CUTTING EDGE CARBIDE HELI-
CAL END MILL WITH THREADED SHANK
M30 MATERIAL**

DIN STANDARD

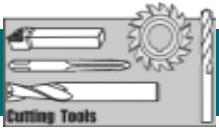
D	d	G	I	L	Z	C	Model No.
16	16	20T.P.I(whit)	32	92	3	0.5	243-1870
18	16	20T.P.I(whit)	32	92	3	0.5	243-1872
20	20	20T.P.I(whit)	38	104	3	0.5	243-1874
22	20	20T.P.I(whit)	38	104	3	0.5	243-1876
25	25	20T.P.I(whit)	45	121	3	0.5	243-1878
28	25	20T.P.I(whit)	45	121	3	0.5	243-1880
25	25	20T.P.I(whit)	45	121	4	0.5	243-1882
28	25	20T.P.I(whit)	45	121	4	0.5	243-1884
32	32	20T.P.I(whit)	53	133	4	0.5	243-1886

ANSI STANDARD

D	d	G	I	L	Z	C	Model No.
5/8	5/8	20T.P.I(whit)	1-1/4	3-1/4	3	1/64	243-1871
3/4	5/8	20T.P.I(whit)	1-1/2	3-21/32	3	1/64	243-1873
7/8	1	20T.P.I(whit)	1-1/2	4-3/16	3	1/64	243-1875
1	1	20T.P.I(whit)	1-3/4	4-5/8	3	1/64	243-1877
1-1/8	1	20T.P.I(whit)	1-3/4	4-5/8	3	1/64	243-1879
1	1	20T.P.I(whit)	1-3/4	4-5/8	4	1/64	243-1881
1-1/8	1	20T.P.I(whit)	1-3/4	4-5/8	4	1/64	243-1883
1-1/4	1-1/4	20T.P.I(whit)	2-1/8	5	4	1/64	243-1885

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY. CAST STEEL	
HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30



Cutting Tools

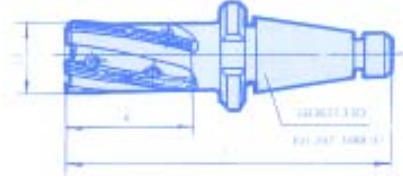
**FORMED CUTTING EDGE
CARBIDE HELICAL END MILL
WITH COMBINATION SHANK
M30 MATERIAL**



ANSI STANDARD

D	d	l	L	Z	C	Model No.
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1901
2	2	3	7	6	1/32	243-1903
2-1/2	2-1/2	3-5/8	8	6	1/32	243-1905

**HELICAL END MILL WITH MECHANICALLY
CLAMPED INDEXABLE CARBIDE TIPPED
BLADES WITH 7/24 TAPER SHANK
M30 MATERIAL**



ISO STANDARD

D	l	L	ISO	Z	Model No.
63	57	276.8	50#	4	243-1900
63	114	296.8	50#	4	243-1902
90	114	299.8	50#	6	243-1904
90	171	356.8	50#	6	243-1906
90	228	413.8	50#	6	243-1908

**INTERRUPTED CUTTING EDGE CARBIDE
HELICAL END MILL WITH OBLIQUE
FLATTED , M30 MATERIAL**



DIN STANDARD

D	d	l	L	Z	C	Model No.
16	16	32	92	3	0.5	243-1930
20	20	38	104	3	0.5	243-1932
25	25	45	121	4	0.5	243-1934
28	28	45	121	4	0.5	243-1936
32	32	53	133	4	0.5	243-1938
36	36	53	133	4	0.5	243-1940
40	40	63	155	4	0.8	243-1942
45	45	63	155	4	0.8	243-1944
50	50	75	177	6	0.8	243-1946

ANSI STANDARD

D	d	l	L	Z	C	Model No.
5/8	5/8	1-1/4	3-5/8	3	1/64	243-1931
3/4	3/4	1-1/2	4-1/8	3	1/64	243-1933
1	1	1-3/4	4-3/4	4	1/64	243-1935
1-1/8	1	1-3/4	4-3/4	4	1/64	243-1937
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1939
1-3/8	1-1/4	2-1/8	5-1/4	4	1/64	243-1941
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1943
1-3/4	1-1/2	2-1/2	6-1/8	4	1/32	243-1945
2	2	3	7	6	1/32	243-1947

**INTERRUPTED CUTTING EDGE CARBIDE
HELICAL END MILL WITH WELDON
SHANK(FLATTED PARALLEL SHANK)
M30 MATERIAL**



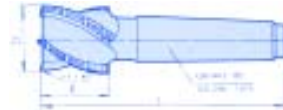
DIN STANDARD

D	d	l	L	Z	C	Model No.
25	25	45	121	4	0.5	243-1950
28	25	45	121	4	0.5	243-1952
32	32	53	133	4	0.5	243-1954
36	32	53	133	4	0.5	243-1956
40	40	63	155	4	0.8	243-1958
45	40	63	155	4	0.8	243-1960
50	50	75	177	6	0.8	243-1962

ANSI STANDARD

D	d	l	L	Z	C	Model No.
1	1	1-3/4	4-3/4	4	1/64	243-1951
1-1/8	1	1-3/4	4-3/4	4	1/64	243-1953
1-1/4	1-1/4	2-1/8	5-1/4	4	1/64	243-1955
1-3/8	1-1/4	2-1/8	5-1/4	4	1/64	243-1957
1-1/2	1-1/2	2-1/2	6-1/8	4	1/64	243-1959
1-3/4	1-1/2	2-1/2	6-1/8	4	1/32	243-1961
2	2	3	7	6	1/32	243-1963

**INTERRUPTED CUTTING EDGE CARBIDE
HELICAL END MILL WITH MORSE TAPER
SHANK(ISO 296) , M30 MATERIAL**



ISO STANDARD

D	l	L	M	Z	Model No.
25	45	147	3#	4	243-1970
28	45	147	3#	4	243-1972

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY.	
CAST STEEL HIGH STRENGTH STEEL HIGH-TEMPERATURE STEEL	M30



INTERRUPTED CUTTING EDGE CARBIDE HELICAL END MILL WITH MORSE TAPER SHANK WITH DRIVING FLATS ON COLLAR M30 MATERIAL



ISO STANDARD

D	I	L	M	Z	C	Model No.
32	53	201	4#	4	0.5	243-2600
36	53	201	4#	4	0.5	243-2602
40	63	211	4#	4	0.8	243-2604
45	63	249	5#	4	0.8	243-2606
50	75	261	5#	6	0.8	243-2608

INTERRUPTED CUTTING EDGE CARBIDE HELICAL END MILL WITH 7/24 TAPER SHANK (ISO/R297) M30 MATERIAL



ISO STANDARD

D	I	L	M	Z	Model No.
40	63	198	40#	4	243-2610
50	75	252	50#	6	243-2612
63	90	267	50#	6	243-2614

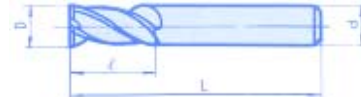
SLOTING END MILL (SOLID CARBIDE)



ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-2620	244-2620
3.0	4.0	37	5	243-2622	244-2622
3.5	3.5	32	12	243-2624	244-2624
3.5	4.0	38	6	243-2626	244-2626
4.0	4.0	40	12	243-2628	244-2628
4.0	4.0	39	7	243-2630	244-2630
4.5	4.5	50	14	243-2632	244-2632
5.0	5.0	42	8	243-2634	244-2634
5.0	5.0	50	14	243-2636	244-2636
6.0	6.0	50	16	243-2638	244-2638
6.0	6.0	52	8	243-2640	244-2640
7.0	7.0	60	20	243-2642	244-2642
7.0	8.0	54	10	243-2644	244-2644
8.0	8.0	55	11	243-2646	244-2646
8.0	8.0	60	20	243-2648	244-2648
9.0	9.0	60	20	243-2650	244-2650
9.0	10.0	61	11	243-2652	244-2652
10.0	10.0	63	13	243-2654	244-2654
10.0	10.0	70	22	243-2656	244-2656
12.0	12.0	70	22	243-2658	244-2658
12.0	12.0	73	16	243-2660	244-2660
14.0	12.0	73	16	243-2662	244-2662
14.0	14.0	75	25	243-2664	244-2664

THREE-FLUTE END MILL (SOLID CARBIDE)

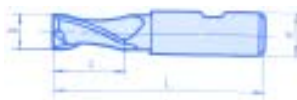


ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-2700	244-2700
3.0	4.0	40	8	243-2702	244-2702
3.5	3.5	32	12	243-2704	244-2704
3.5	4.0	42	10	243-2706	244-2706
4.0	4.0	40	12	243-2708	244-2708
4.0	4.0	43	11	243-2710	244-2710
4.5	4.5	50	14	243-2712	244-2712
5.0	5.0	47	13	243-2714	244-2714
5.0	5.0	50	14	243-2716	244-2716
6.0	6.0	50	16	243-2718	244-2718
6.0	6.0	57	13	243-2720	244-2720
7.0	7.0	60	20	243-2722	244-2722
7.0	8.0	60	16	243-2724	244-2724
8.0	8.0	60	20	243-2726	244-2726
8.0	8.0	63	19	243-2728	244-2728
9.0	9.0	60	20	243-2730	244-2730
9.0	10.0	69	19	243-2732	244-2732
10.0	10.0	63	13	243-2734	244-2734
10.0	10.0	72	22	243-2736	244-2736
12.0	12.0	70	22	243-2738	244-2738
12.0	12.0	83	26	243-2740	244-2740
14.0	12.0	83	26	243-2742	244-2742
14.0	14.0	75	25	243-2744	244-2744

TWO-FLUTE END MILL

(SOLID CARBIDE)



D	d	L	I	K30	M30
				Model No.	Model No.
3.0	6	49	5	243-2750	244-2750
3.5	6	50	6	243-2752	244-2752
4.0	6	51	7	243-2754	244-2754
5.0	6	52	8	243-2756	244-2756
6.0	6	52	8	243-2758	244-2758
7.0	10	60	10	243-2760	244-2760
8.0	10	61	11	243-2762	244-2762
9.0	10	61	11	243-2764	244-2764
10.0	10	63	13	243-2766	244-2766
12.0	12	73	16	243-2768	244-2768
14.0	12	73	16	243-2770	244-2770

ANSI STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
1/8	3/8	2-5/16	3/8	243-2751	244-2751
3/16	3/8	2-5/16	7/16	243-2753	244-2753
1/4	3/8	2-5/16	1/2	243-2755	244-2755
5/16	3/8	2-5/16	9/16	243-2757	244-2757
3/8	3/8	2-5/16	9/16	243-2759	244-2759
7/16	3/8	2-1/2	13/16	243-2761	244-2761
1/2	3/8	2-1/2	13/16	243-2763	244-2763
1/2	1/2	3	1	243-2765	244-2765
9/16	1/2	3-1/8	1/8	243-2767	244-2767

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON , TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL	M30
HIGH-TEMPERATURE STEEL	



Cutting Tools

FOUR-FLUTE END MILL

(SOLID CARBIDE)



ANSI STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
1/8	1/8	1-1/4	5/16	243-2801	244-2801
3/16	3/16	1-3/8	1/2	243-2803	244-2803
1/4	1/4	1-11/16	5/8	243-2805	244-2805
3/8	3/8	1-13/16	3/4	243-2807	244-2807
1/2	1/2	2-1/4	15/16	243-2809	244-2809

ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-2800	244-2800
3.0	4.0	40	8	243-2802	244-2802
3.5	3.5	32	12	243-2804	244-2804
3.5	4.0	42	10	243-2806	244-2806
4.0	4.0	40	12	243-2808	244-2808
4.0	4.0	43	11	243-2810	244-2810
4.5	4.5	50	14	243-2812	244-2812
5.0	5.0	47	13	243-2814	244-2814
5.0	5.0	50	14	243-2816	244-2816
6.0	6.0	50	16	243-2818	244-2818
6.0	6.0	57	13	243-2820	244-2820
7.0	7.0	60	20	243-2822	244-2822
7.0	8.0	60	16	243-2824	244-2824
8.0	8.0	60	20	243-2826	244-2826
8.0	8.0	63	19	243-2828	244-2828
9.0	9.0	60	20	243-2830	244-2830
9.0	10.0	69	19	243-2832	244-2832
10.0	10.0	63	13	243-2834	244-2834
10.0	10.0	72	22	243-2836	244-2836
12.0	12.0	70	22	243-2838	244-2838
12.0	12.0	83	26	243-2840	244-2840
14.0	12.0	83	26	243-2842	244-2842
14.0	14.0	75	25	243-2844	244-2844

CENTER CUTTING FOUR-FLUTE END MILL (SOLID CARBIDE)



ANSI STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
1/8	3/8	2-5/16	3/8	243-2851	244-2851
3/16	3/8	2-3/8	1/2	243-2853	244-2853
1/4	3/8	2-7/16	5/8	243-2855	244-2855
5/16	3/8	2-1/2	3/4	243-2857	244-2857
3/8	3/8	2-1/2	3/4	243-2859	244-2859
7/16	3/8	2-11/16	1	243-2861	244-2861
1/2	3/8	2-11/16	1	243-2863	244-2863
1/2	1/2	3-1/4	1-1/4	243-2865	244-2865
9/16	1/2	3-3/8	1-3/8	243-2867	244-2867

ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3	32	12	243-2850	244-2850
3.0	6	52	8	243-2852	244-2852
3.5	3.5	32	12	243-2854	244-2854
3.5	6	54	10	243-2856	244-2856
4.0	4	40	12	243-2858	244-2858
4.0	6	55	11	243-2860	244-2860
4.5	4.5	50	14	243-2862	244-2862
5.0	6	57	13	243-2864	244-2864
5.0	5	50	14	243-2866	244-2866
6.0	6	57	13	243-2868	244-2868
6.0	6	50	16	243-2870	244-2870
7.0	10	66	16	243-2872	244-2872
7.0	7	60	20	243-2874	244-2874
8.0	10	69	19	243-2876	244-2876
8.0	8	60	20	243-2878	244-2878
9.0	10	69	19	243-2880	244-2880
9.0	9	60	20	243-2882	244-2882
10.0	10	72	22	243-2884	244-2884
10.0	10	70	22	243-2886	244-2886
12.0	12	83	26	243-2888	244-2888
12.0	12	70	22	243-2890	244-2890
14.0	12	83	26	243-2892	244-2892
14.0	14	75	25	243-2894	244-2894

THREE-FLUTE END MILL WITH CENTER TOOTH

(SOLID CARBIDE)

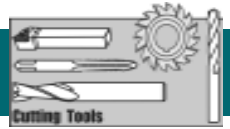


ISO STANDARD

D	d	L	I	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-3100	244-3100
3.0	4.0	40	8	243-3102	244-3102
3.5	3.5	32	12	243-3104	244-3104
3.5	4.0	42	10	243-3106	244-3106
4.0	4.0	40	12	243-3108	244-3108
4.0	4.0	43	11	243-3110	244-3110
4.5	4.5	50	14	243-3112	244-3112
5.0	5.0	47	13	243-3114	244-3114
5.0	5.0	50	14	243-3116	244-3116
6.0	6.0	50	16	243-3118	244-3118
6.0	6.0	57	13	243-3120	244-3120
7.0	7.0	60	20	243-3122	244-3122
7.0	8.0	60	16	243-3124	244-3124
8.0	8.0	60	20	243-3126	244-3126
8.0	8.0	63	19	243-3128	244-3128
9.0	9.0	60	20	243-3130	244-3130
9.0	10.0	69	19	243-3132	244-3132
10.0	10.0	63	13	243-3134	244-3134
10.0	10.0	72	22	243-3136	244-3136
12.0	12.0	70	22	243-3138	244-3138
12.0	12.0	83	26	243-3140	244-3140
14.0	12.0	83	26	243-3142	244-3142
14.0	14.0	75	25	243-3144	244-3144

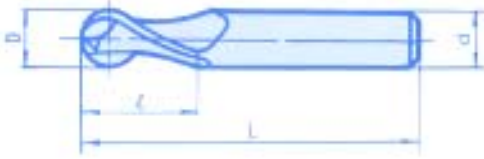
INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON, TITANIUM ALLOY, CAST STEEL	
HIGH STRENGTH STEEL	M30
HIGH-TEMPERATURE STEEL	



ROUND-NOSE END MILL

(SOLID CARBIDE)

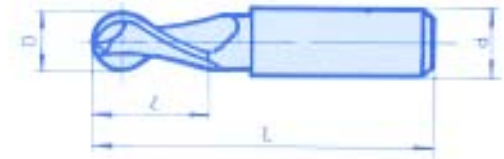


ISO STANDARD

D	d	L	l	K30	M30
				Model No.	Model No.
3.0	3.0	32	12	243-3000	244-3000
3.5	3.5	32	12	243-3002	244-3002
4.0	4.0	40	12	243-3004	244-3004
4.5	4.5	50	14	243-3006	244-3006
5.0	5.0	50	14	243-3008	244-3008
6.0	6.0	50	16	243-3010	244-3010
7.0	7.0	60	20	243-3012	244-3012
8.0	8.0	60	20	243-3014	244-3014
9.0	9.0	60	20	243-3016	244-3016
10.0	10.0	70	22	243-3018	244-3018
12.0	12.0	70	22	243-3020	244-3020
14.0	14.0	75	25	243-3022	244-3022

ROUND-NOSE END MILL

(SOLID CARBIDE)



ISO STANDARD

D	d	L	l	K30	M30
				Model No.	Model No.
3.0	4	37	5	243-3030	244-3030
3.5	4	38	6	243-3032	244-3032
4.0	4	39	7	243-3034	244-3034
5.0	5	42	8	243-3036	244-3036
6.0	6	52	8	243-3038	244-3038
7.0	8	54	10	243-3040	244-3040
8.0	8	55	11	243-3042	244-3042
9.0	10	61	11	243-3044	244-3044
10.0	10	63	13	243-3046	244-3046
12.0	12	73	16	243-3048	244-3048
14.0	12	73	16	243-3050	244-3050

ROUND-NOSE END MILL

WITH WELDON SHANK

(SOLID CARBIDE)



ANSI STANDARD

D	d	L	l	K30	M30
				Model No.	Model No.
1/8	3/8	2-5/16	3/8	243-3061	244-3061
3/16	3/8	2-3/8	1/2	243-3063	244-3063
1/4	3/8	2-7/16	5/8	243-3065	244-3065
5/16	3/8	2-1/2	3/4	243-3067	244-3067
3/8	3/8	2-1/2	3/4	243-3069	244-3069
7/16	1/2	3	1	243-3071	244-3071
1/2	1/2	3	1	243-3073	244-3073
9/16	1/2	3-1/8	1-1/8	243-3075	244-3075

ISO STANDARD

D	d	L	l	K30	M30
				Model No.	Model No.
3.0	6	49	5	243-3060	244-3060
3.5	6	50	6	243-3062	244-3062
4.0	6	51	7	243-3064	244-3064
5.0	6	52	8	243-3066	244-3066
6.0	6	52	8	243-3068	244-3068
7.0	10	60	10	243-3070	244-3070
8.0	10	61	11	243-3072	244-3072
9.0	10	61	11	243-3074	244-3074
10.0	10	63	13	243-3076	244-3076
12.0	12	73	16	243-3078	244-3078
14.0	12	73	16	243-3080	244-3080

RECOMMENDED CUTTING PARAMETERS FOR CARBIDE

END MILL HOW TO CHOOSE CARBIDE GRADES

MILLS	CUTTING SPEED (m/min)	FEED PER TOOTH (mm)
2FL END MILL	300-900	0.05-0.15
MULTI END MILL		
ROUGHING	60-80	0.05-0.15
SEMI-FINISHING	70-90	0.04-0.12
FINISHING	70-110	0.03-0.10

INSTRUCTION

MATERIAL TO BE MACHINED	CARBIDE GRADE
ALUMINUM AND MAGNESIUM ALLOY AND OTHER LIGHT ALLOYS	K30
CAST IRON, TITANIUM ALLOY.	
CAST STEEL	M30
HIGH STRENGTH STEEL	
HIGH-TEMPERATURE STEEL	