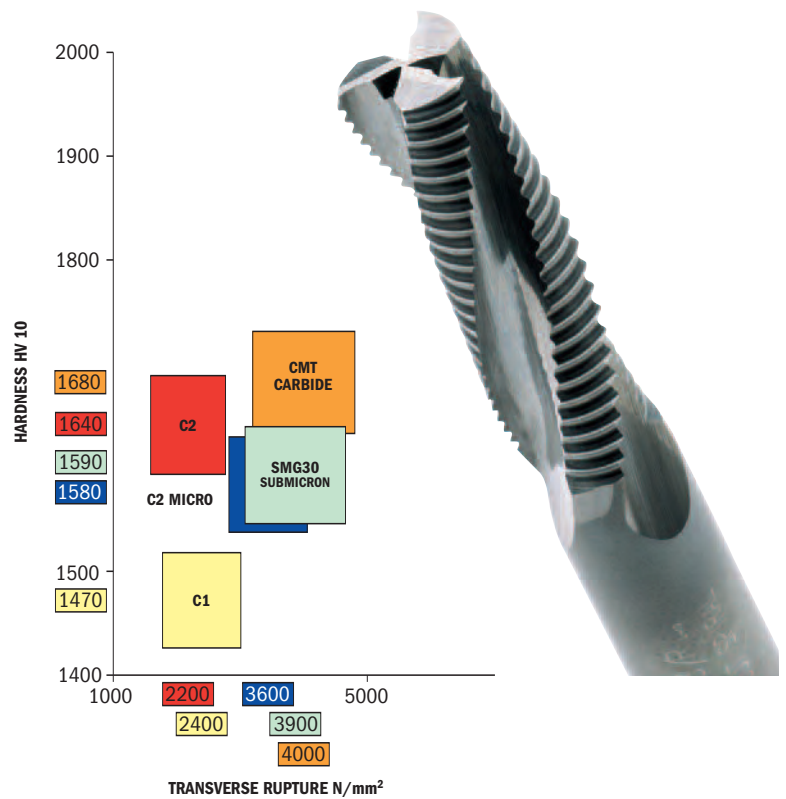
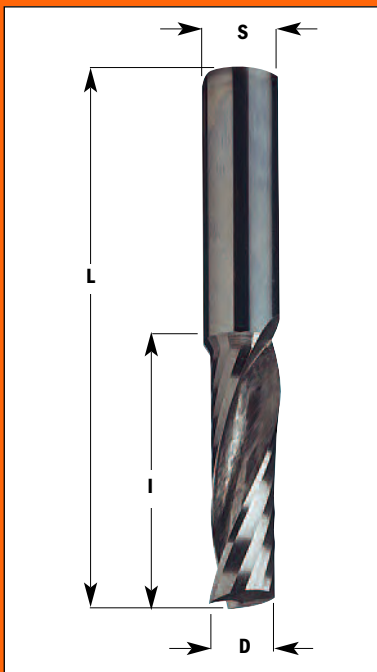


Sharp technology With a new twist

A special super-micrograin carbide formulation was created to produce and hold a keen cutting edge.

The new low-angle spiral is designed specifically to shear wood cleanly and provide efficient chip ejection. The tools run cooler and the edge lasts longer.

Increased feed rates while improving cut quality, means increased productivity with CMT.



...up cut

198 HWM Z1

	S=D		I	L	ORDER NO.
	Cutting diameter	mm			
	3		12	50	198.030.11
new	3,18	1/8	12,7	50,8	198.001.11
	4		15	50	198.040.11
new	4,76	3/16	15,87	50,8	198.005.11
	5		17	50	198.050.11
	6		22	60	198.060.11
new	6,35	1/4	19,05	50,8	198.007.11
new	6,35	1/4	25,4	63,5	198.008.11
	8		22	70	198.080.11
new	9,52	3/8	28,57	76,2	198.504.11
	10		32	70	198.100.11
	12		32	80	198.120.11

TECHNICAL DETAILS:

- Premium quality HWM
- 1 up cut spiral cutting edge HW [Z1]
- Provides an excellent finish on the lower side of the work piece
- Upward chip ejection

APPLICATION: used for cutting, copying, panel sizing and any routing applications in solid wood, wood composites, plastic materials and laminates. Use a high feed speed on well-clamped workpieces. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.

...up & down cut

190 HWM Z2+2

S=D Cutting diameter		I Cutting length	I ₂ Pos. cutting length	L Overall length	ORDER NO. Right-hand rotation
mm	inches	mm	mm	mm	
8		32	7	80	190.080.11
9,53	3/8	28,6	7	76,2	190.504.11
10		32	7	80	190.100.11
12		42	7	90	190.120.11
12,7	1/2	25,4	16	76,2	190.505.11
12,7	1/2	28,6	16	76,2	190.506.11
12,7	1/2	34,9	16	88,9	190.507.11
12,7	1/2	41,3	16	101,6	190.508.11
16		55	24	110	190.160.11
18		55	30	110	190.180.11

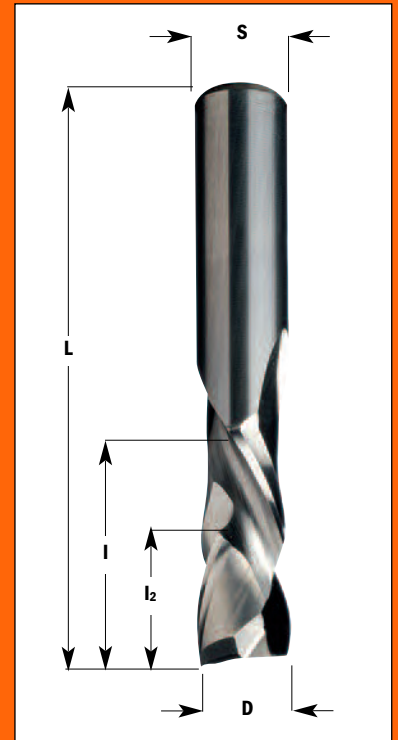
...up & down cut mortising bits

9,53	3/8	22,2	4,8	76,2	190.513.11
12,7	1/2	22,2	5,2	76,2	190.515.11
12,7	1/2	34,9	5,2	88,9	190.517.11

TECHNICAL DETAILS:

- Premium quality HWM
- 2+2 spiral cutting edges (Z2+2)
- Provides an excellent finish on both the upper and lower sides of the workpiece

APPLICATION: used for cutting, copying, panel sizing and any routing applications in solid wood, wood composites, plastic materials and laminates. Use a high feed speed on well-clamped workpieces. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.



...up cut

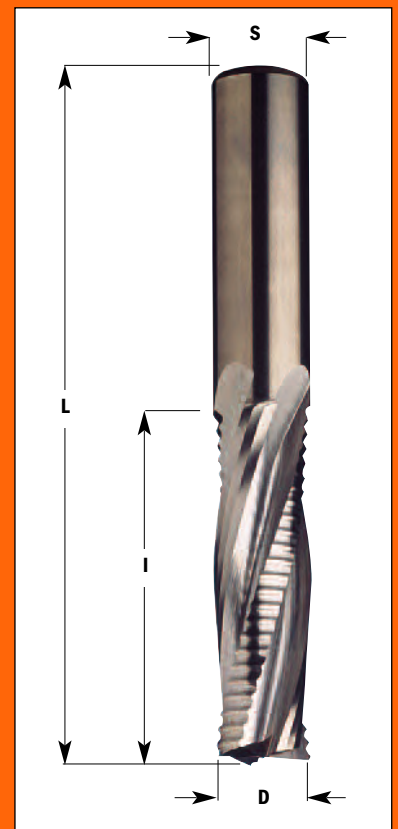
197 HWM Z4 [2+2R]

S=D Cutting diameter		I Cutting length	L Overall length	ORDER NO. Right-hand rotation
mm		mm	mm	
12		42	90	197.121.11
14		50	110	197.140.11
16		55	110	197.160.11
16		35	90	197.161.11
18		55	110	197.180.11
20		60	120	197.200.11
20		70	120	197.201.11

TECHNICAL DETAILS:

- Premium quality HWM
- 4 spiral cutting edges (2 with chip-breaker) [Z2+2R]
- Tooth depth max 0.1mm
- Provides excellent finish on the lower side of the workpiece
- Upward chip ejection

APPLICATION: used for ripping, template routing, panel sizing and any routing applications in solid wood and wood composites. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.





...up cut with chip-breaker

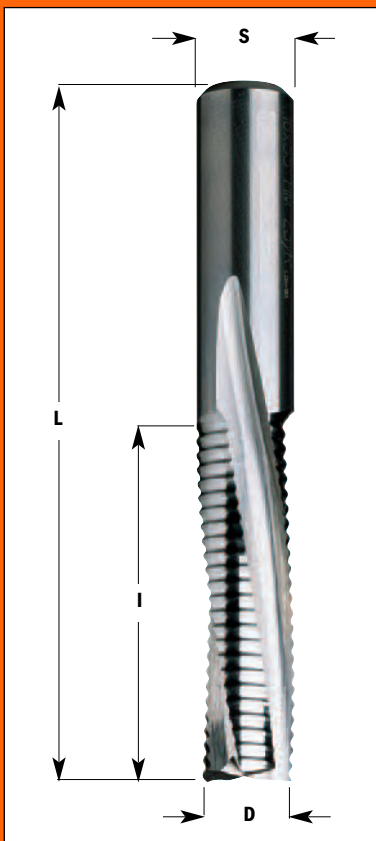
195 HWM Z3R

S=D Cutting diameter		I Cutting length	L Overall length	ORDER NO. Right-hand rotation	ORDER NO. Left-hand rotation
mm	inches	mm	mm		
8		32	80	195.081.11	
10		32	80	195.100.11	
10		42	90	195.101.11	
12		35	80	195.120.11	195.120.12
12		42	90	195.121.11	
12,7	1/2	38,1	88,9	195.506.11	
14		58	110	195.140.11	
15,88	5/8	54	109,5	195.509.11	
16		55	110	195.160.11	195.160.12
16		35	90	195.161.11	
18		55	110	195.180.11	
19,05	3/4	54	109,5	195.511.11	
20		60	120	195.200.11	195.200.12
20		70	120	195.201.11	

TECHNICAL DETAILS:

- Premium quality HWM
- 3 spiral cutting edges (Z3R)
- Chip breaker teeth
- Tooth depth max 0.3mm
- Provides an excellent finish on the lower side of the workpiece
- Upward chip ejection

APPLICATION: used for ripping, template routing, panel sizing and any routing applications in solid wood, or wood composites. Can be used at a high feed speed on well-clamped workpieces. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.



...down cut with chip-breaker

196 HWM Z3R

S=D Cutting diameter		I Cutting length	L Overall length	ORDER NO. Right-hand rotation	ORDER NO. Left-hand rotation
mm	inches	mm	mm		
8		32	80	196.081.11	
10		42	90	196.101.11	
12		35	80	196.120.11	196.120.12
12,7	1/2	38,1	88,9	196.506.11	
14		50	110	196.140.11	
15,88	5/8	54	109,5	196.509.11	
16		55	110	196.160.11	196.160.12
18		55	110	196.180.11	
19,05	3/4	54	109,5	196.511.11	
20		60	120	196.200.11	196.200.12

TECHNICAL DETAILS:

- Premium quality HWM
- 3 spiral cutting edges (Z3R)
- Chip breaker teeth
- Tooth depth max 0.3mm
- Provides excellent finish on the upper side of the workpiece
- Downward chip ejection.

APPLICATION: used for ripping, template routing, panel sizing and any routing applications in solid wood and wood composites. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.

...up cut

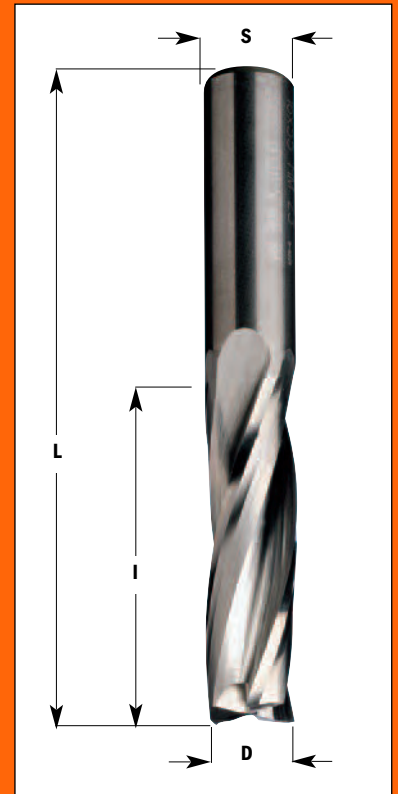
193 HWM Z3

S=D Cutting diameter mm	I Cutting length mm	L Overall length mm	ORDER NO. Right-hand rotation	ORDER NO. Left-hand rotation
8	32	80	193.081.11	
10	32	80	193.100.11	
10	42	90	193.101.11	
12	35	80	193.120.11	193.120.12
12	42	90	193.121.11	
14	58	110	193.140.11	
16	55	110	193.160.11	193.160.12
16	35	90	193.161.11	
18	55	110	193.180.11	
20	60	120	193.200.11	193.200.12
20	70	120	193.201.11	

TECHNICAL DETAILS:

- Premium quality HWM
- 3 spiral cutting edges (Z3)
- Provides an excellent finish on the lower side of the workpiece
- Upward chip ejection

APPLICATION: used for ripping, template routing, panel sizing and any routing applications in solid wood, or wood composites. Can be used at a high feed speed on well-clamped workpieces. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.



...down cut

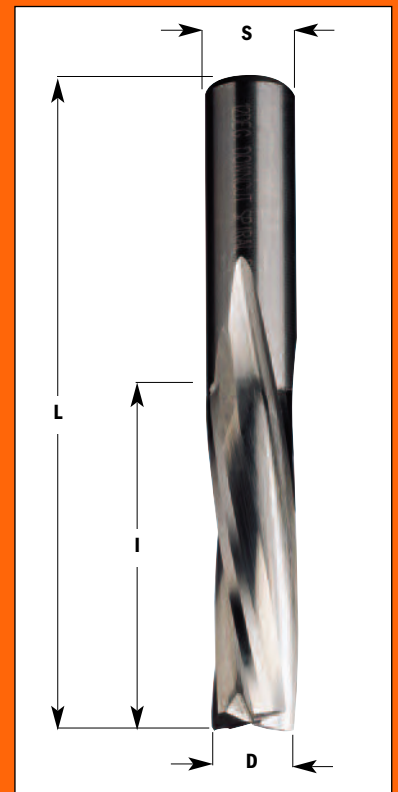
194 HWM Z3

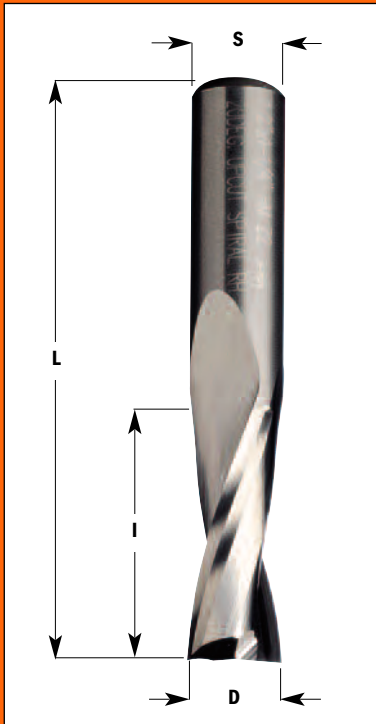
S=D Cutting diameter mm	I Cutting length mm	L Overall length mm	ORDER NO. Right-hand rotation	ORDER NO. Left-hand rotation
10	32	80	194.100.11	
12	35	80	194.120.11	194.120.12
14	50	110	194.140.11	
16	55	110	194.160.11	194.160.12
16	35	90	194.161.11	
18	55	110	194.180.11	
20	60	120	194.200.11	194.200.12

TECHNICAL DETAILS:

- Premium quality HWM
- 3 spiral cutting edges (Z3)
- Provides an excellent finish on the upper side of the workpiece
- Downward chip ejection

APPLICATION: used for ripping, template routing, panel sizing and any routing applications in solid wood, wood composites, plastic materials and laminates. Can be used at a high feed speed on small, difficult to clamp workpieces. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.





...up cut

191 HWM Z2

D Cutting diameter mm inches		I Cutting length mm	L Overall length mm	S Shank diameter mm	ORDER NO. Right-hand rotation
3		12	50	3	191.030.11
3		12	60	6	191.630.11
3		12	60	8	191.830.11
3,18	1/8	12,7	50,8	6,35	191.001.11
3,5		12	60	6	191.635.11
3,97	5/32	12,7	50,8	6,35	191.003.11
4		15	50	4	191.040.11
4		15	60	6	191.640.11
4		15	60	8	191.840.11
4,76	3/16	19,05	50,8	6,35	191.005.11
5		17	50	5	191.050.11
5		17	60	6	191.650.11
5		17	60	8	191.850.11
6		22	70	6	191.060.11
6		22	70	8	191.860.11
6,35	1/4	19,05	50,8	6,35	191.007.11
6,35	1/4	25,4	63,5	6,35	191.008.11
7		32	80	8	191.870.11
7,94	5/16	25,4	76,2	12,7	191.501.11
8		22	70	8	191.080.11
8		32	80	8	191.081.11
9		32	80	12	191.890.11
9,53	3/8	31,75	76,2	12,7	191.503.11
10		32	80	8	191.800.11
10		32	80	10	191.100.11
10		32	80	12	191.900.11
10		42	90	10	191.101.11
10		42	90	12	191.901.11
12		35	80	8	191.820.11
12		35	80	12	191.120.11
12		42	90	12	191.121.11
12,7	1/2	31,75	76,2	12,7	191.505.11
12,7	1/2	38,1	88,9	12,7	191.506.11
12,7	1/2	50,8	101,6	12,7	191.507.11
14		50	110	14	191.140.11
15,88	5/8	55	109,5	15,88	191.509.11
16		55	110	16	191.160.11
16		35	90	16	191.161.11
19,05	3/4	55	109,5	19,05	191.511.11
20		60	120	20	191.200.11

TECHNICAL DETAILS:

- Premium quality HWM
- 2 spiral cutting edges (Z2)
- Provides an excellent finish on the lower side of the workpiece
- Upward chip ejection

APPLICATION: used for ripping, template routing, panel sizing and any routing applications in solid wood, wood composites, plastic materials and laminates.

Can be used at a high feed speed on well-clamped workpieces. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.

...down cut
192 HWM Z2

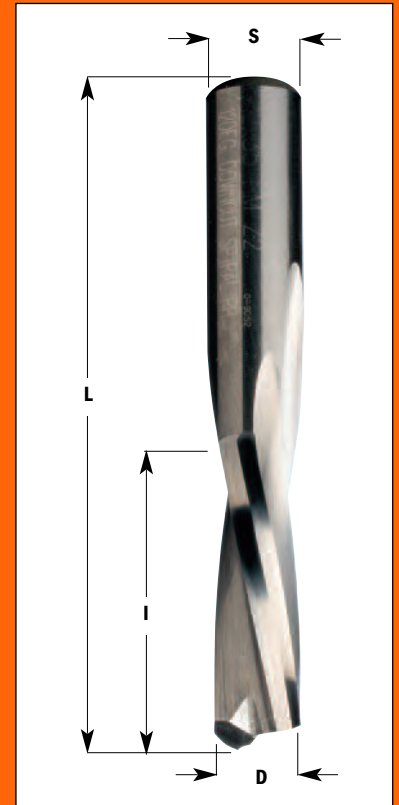
D Cutting diameter		I Cutting length	L Overall length	S Shank diameter	ORDER NO. Right-hand rotation
mm	inches	mm	mm	mm	
3		12	50	3	192.030.11
3		12	60	6	192.630.11
3		12	60	8	192.830.11
3,18	1/8	12,7	50,8	6,35	192.001.11
3,97	5/32	12,7	50,8	6,35	192.003.11
4		15	50	4	192.040.11
4		15	60	6	192.640.11
4		15	60	8	192.840.11
4,76	3/16	19,05	50,8	6,35	192.005.11
5		17	50	5	192.050.11
5		17	60	6	192.650.11
5		17	60	8	192.850.11
6		22	70	6	192.060.11
6		22	70	8	192.860.11
6,35	1/4	19,05	50,8	6,35	192.007.11
6,35	1/4	25,4	63,5	6,35	192.008.11
7,94	5/16	25,4	76,2	12,7	192.501.11
8		22	70	8	192.080.11
8		32	80	8	192.081.11
9,53	3/8	31,75	76,2	12,7	192.503.11
10		32	80	8	192.800.11
10		32	80	10	192.100.11
10		32	80	12	192.900.11
12		35	80	8	192.820.11
12		35	80	12	192.120.11
12,7	1/2	31,75	76,2	12,7	192.505.11
12,7	1/2	38,1	88,9	12,7	192.506.11
12,7	1/2	50,8	101,6	12,7	192.507.11
16		55	110	16	192.160.11

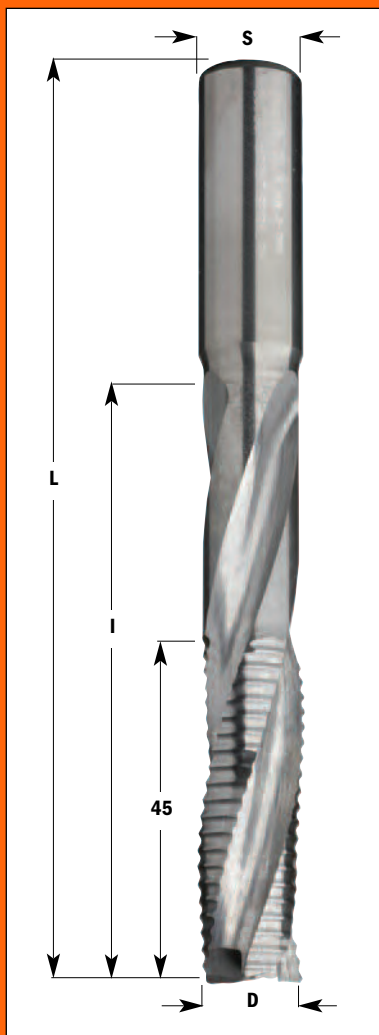
TECHNICAL DETAILS:

- Premium quality HWM
- 2 spiral edges (Z2)
- Provides an excellent finish on the upper side of the workpiece
- Downward chip ejection

APPLICATION: used for ripping, template routing, panel sizing and any routing applications in solid wood, wood composites, plastic materials and laminates. Can be used at a high feed speed on small, difficult to clamp work pieces.

Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.





...up cut, for lockset with chip-breaker

195 HWM Z3R

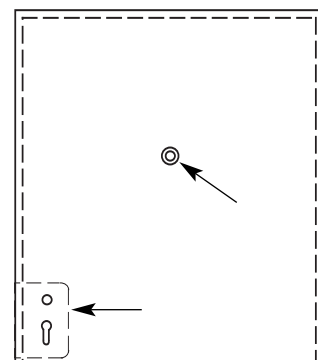
	S=D Cutting diameter mm	I Cutting length mm	L Overall length mm	ORDER NO. Right-hand rotation
new	14	95*	150	195.142.11
	16	95*	150	195.162.11
new	18	95*	150	195.182.11

* The length 95mm is made in 2-3 passes.

TECHNICAL DETAILS:

- Premium quality HWM
- 3 spiral cutting edges (Z3R)
- Chip breaker teeth
- Tooth depth max 0.3mm
- Provides an excellent finish on the lower side of the workpiece
- Upward chip ejection

APPLICATION: used for ripping, template routing, panel sizing and any routing applications in solid wood, or wood composites. Can be used at a high feed speed on well-clamped workpieces. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.



...up cut with chipbreaker,
for lockset with 60° V-Point

195.143/163 HWM Z3R

	S=D Cutting diameter mm	I Cutting length mm	L Overall length mm	ORDER NO. Right-hand rotation
	14	58	110	195.143.11
	16	55	110	195.163.11

...up cut without chipbreaker,
for lockset with 60° V-Point

191.143/163 HWM Z3R

	S=D Cutting diameter mm	I Cutting length mm	L Overall length mm	ORDER NO. Right-hand rotation
	14	50	110	191.143.11
	16	55	110	191.163.11

TECHNICAL DETAILS:

- Premium quality HWM
- 3 spiral cutting edges (Z3)
- Provides an excellent finish on the lower side of the workpiece
- Upward chip ejection

APPLICATION: used for ripping, template routing, panel sizing and any routing applications in solid wood, or wood composites. Can be used at a high feed speed on well-clamped workpieces. Can be used on machining centres, point to point machines, CNC routers and hand-held routers equipped with chucks or adaptors.

140 DP Z1+1

D Cutting diameter mm inches	I Cutting length mm	L Overall length mm	S Shank diameter mm	Z No. of teeth	ORDER NO. Right-hand rotation
12	27	70	12x35	1+1 (3 DP)	140.120.61
12	36	80	12x35	1+1 (4 DP)	140.121.61
12,7 1/2	27	70	12,7	1+1 (3 DP)	140.127.61
12,7 1/2	36	80	12,7	1+1 (4 DP)	140.128.61
15,87 5/8	27	85	15,87	1+1 (3 DP)	140.158.61
15,87 5/8	45	100	15,87	1+1 (5 DP)	140.159.61
16	27	90	16x50	1+1 (3 DP)	140.160.61
16	36	95	16x45	1+1 (4 DP)	140.161.61
18	27	80	16x45	1+1 (3 DP)	140.180.61
18	36	90	16x45	1+1 (4 DP)	140.181.61
18	45	100	16x45	1+1 (5 DP)	140.182.61
19,05 3/4	27	90	19,05	1+1 (3 DP)	140.190.61
19,05 3/4	45	105	19,05	1+1 (5 DP)	140.192.61
20	27	85	20x50	1+1 (3 DP)	140.200.61
20	36	95	20x50	1+1 (4 DP)	140.201.61
20	45	105	20x50	1+1 (5 DP)	140.202.61
20	54	115	20x50	1+1 (6 DP)	140.203.61

TECHNICAL DETAILS:

- Super strength steel
- DP cutting edge
- HW plunging tip
- Resharpenable cutter (max 3 times)

APPLICATION: for routing and sizing ultra-hard and abrasive material.

Can be used at high feed speed (3~10 m/min.)

Can be used on machining centres, CNC routers equipped with chucks or adaptors.



141 DP Z1

D Cutting diameter mm	I Cutting length mm	L Overall length mm	S Shank diameter mm	Z No. of teeth	ORDER NO. Right-hand rotation
6	8	55	12x35	1	141.060.61
8	12	60	12x35	1	141.080.61
*10	22	65	12x35	1+1	141.101.61

TECHNICAL DETAILS:

- Super strength steel
- DP cutting edge
- HW plunging tip
- Resharpenable cutter (max 3 times)

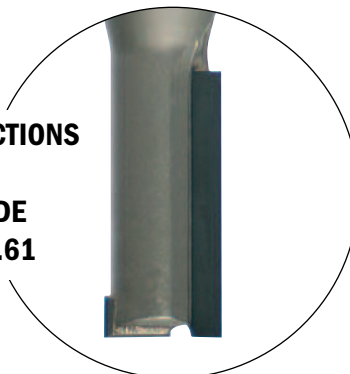
APPLICATION: for routing and sizing ultra-hard and abrasive material.

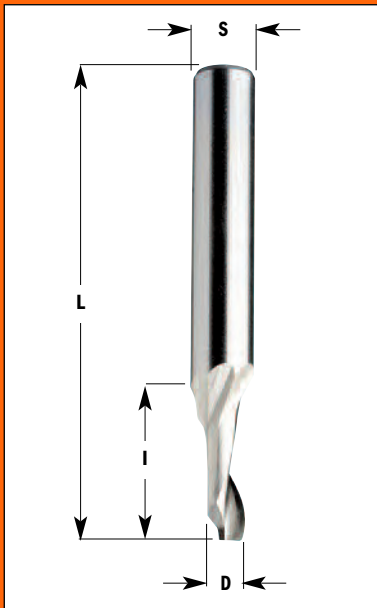
Can be used at high feed speed (3~5 m/min.)

Can be used on machining centres, CNC routers equipped with chucks or adaptors.



*** CONSTRUCTIONS
Z1+1
FOR CODE
141.101.61**

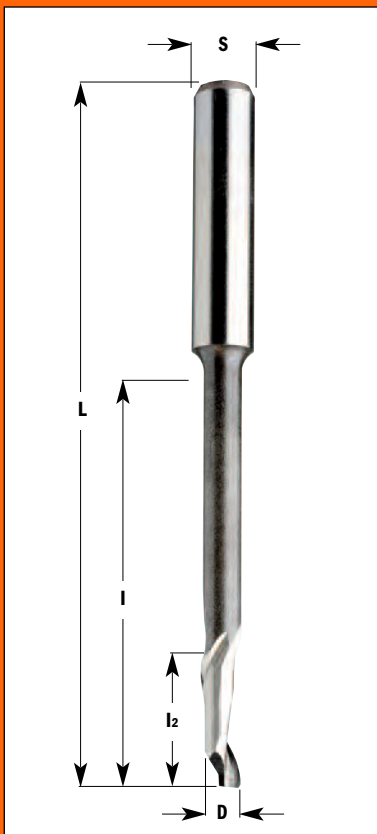




... positive single flute

188 HS 5%co Z1

D Cutting diameter mm	I Cutting length mm	L Overall length mm	S Shank diameter mm	ORDER NO. Right-hand rotation
3	12	60	8	188.030.51
4	12	60	8	188.040.51
4	40	100	8	188.041.51
5	14	60	8	188.050.51
5	40	100	8	188.051.51
6	14	60	8	188.060.51
6	40	100	8	188.061.51
7	14	60	8	188.070.51
8	14	80	8	188.080.51
8	40	100	8	188.081.51
9	14	80	8	188.090.51
10	14	80	8	188.100.51
12	14	80	8	188.120.51



..... positive single flute for high cutting depth

189 HS 5%co Z1

D Cutting diameter mm	I Cutting length mm	I ₂ Cutting length mm	L Overall length mm	S Shank diameter mm	ORDER NO. Right-hand rotation
4	46	16	90	8	189.040.51
5	35	18	80	8	189.050.51
5	35	14	120	8	189.051.51
5	55	16	90	8	189.052.51
6	45	16	90	8	189.060.51
8	68	14	100	8	189.080.51
10	95	14	120	10	189.100.51
10	70	30	100	10	189.101.51

TECHNICAL DETAILS:

- Premium quality solid HS 5%co
- 1 up cut spiral cutting edge
- Upward chip ejection

APPLICATION: the single flute design of these tools, which carves rather than pushes the material, makes them equally effective in all types of aluminum. The end result is that the tools provide more flexibility than the traditional bits, better finishes and higher productivity.



190

Excellent finish

Excellent finish

Upcut & Downcut



191

Excellent finish

Excellent finish

Upcut



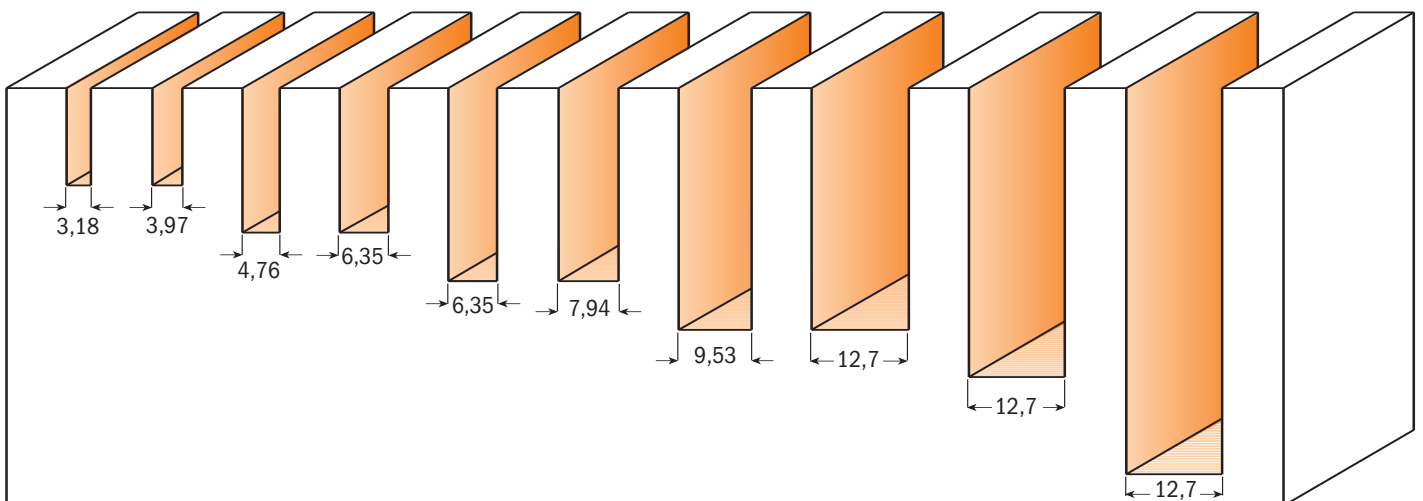
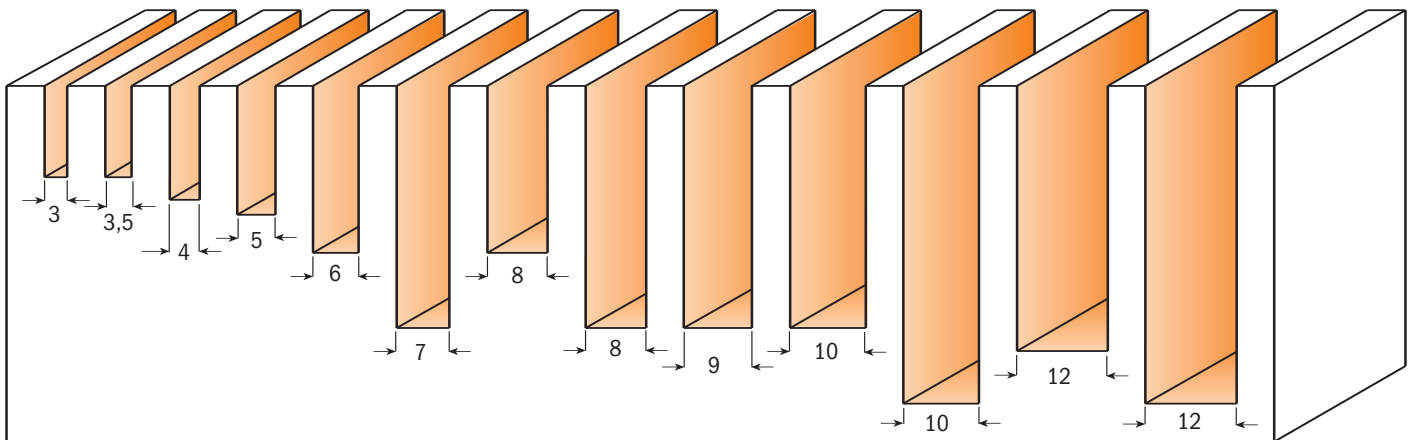
192

Downcut



Due to their spiral cutting edge which stays in continuous contact with the workpiece, these bits give a smooth, chatter-free cutting action, unlike conventional bits which have intermittent contact with the workpiece. Unsurpassed for cleaner cuts in ordinary or difficult materials, softwood, hardwood, plywood, composites etc. This new range of spiral bits with 6, 8, 12mm and 6,35 and 12,7mm shanks allow them to be used with C.N.C. router and hand-routers.

Test check yourselves the extraordinary quality-price ratio of these bits!



Drawings are 1:1 scale

... Z2+2 upcut & downcut spiral

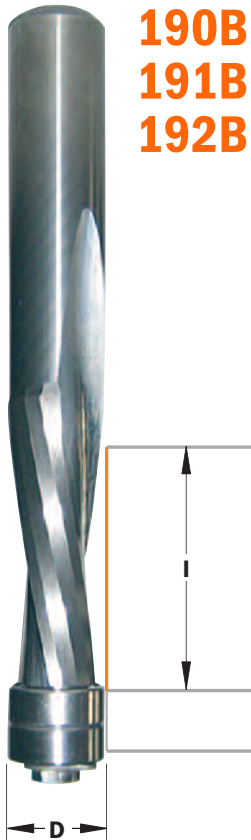
D Cutting diameter		I Cutting length	L Overall length	ORDER NO. Shank Ø 8mm	ORDER NO. Shank Ø 9,5mm	ORDER NO. Shank Ø 10mm	ORDER NO. Shank Ø 12mm	ORDER NO. Shank Ø 12,7mm
mm	inches	mm	mm					
8		32	80	190.080.11				
9,53	3/8	31,75	76,2		190.504.11			
10		32	80			190.100.11		
12		42	90				190.120.11	
12,7	1/2	25,4	76,2					190.505.11
12,7	1/2	28,6	76,2					190.506.11
12,7	1/2	34,9	88,9					190.507.11
12,7	1/2	41,3	101,6					190.508.11

... Z2 upcut spiral

D Cutting diameter		I Cutting length	L Overall length	ORDER NO. Shank Ø 6mm	ORDER NO. Shank Ø 6,35mm	ORDER NO. Shank Ø 8mm	ORDER NO. Shank Ø 12mm	ORDER NO. Shank Ø 12,7mm
mm	inches	mm	mm					
3		12	60	191.630.11		191.830.11		
3,18	1/8	12,7	50,8		191.001.11			
3,5		12	60	191.635.11				
3,97	5/32	12,7	50,8		191.003.11			
4		15	60	191.640.11		191.840.11		
4,76	3/16	19,05	50,8		191.005.11			
5		17	60	191.650.11		191.850.11		
6		22	70	191.060.11		191.860.11		
6,35	1/4	19,05	50,8		191.007.11			
6,35	1/4	25,4	63,5		191.008.11			
7		32	80			191.870.11		
7,94	5/16	25,4	76,2					191.501.11
8		22	70			191.080.11		
8		32	80			191.081.11		
9		32	80				191.890.11	
9,53	3/8	31,75	76,2					191.503.11
10		32	80			191.800.11	191.900.11	
10		42	90				191.901.11	
12		35	80			191.820.11	191.120.11	
12		42	90				191.121.11	
12,7	1/2	31,75	76,2					191.505.11
12,7	1/2	38,1	88,9					191.506.11
12,7	1/2	50,8	101,6					191.507.11
10 pcs. in masterpack					191.008.11-X10			

... Z2 downcut

D Cutting diameter		I Cutting length	L Overall length	ORDER NO. Shank Ø 6mm	ORDER NO. Shank Ø 6,35mm	ORDER NO. Shank Ø 8mm	ORDER NO. Shank Ø 12mm	ORDER NO. Shank Ø 12,7mm
mm	inches	mm	mm					
3		12	60	192.630.11		192.830.11		
3,18	1/8	12,7	50,8		192.001.11			
3,97	5/32	12,7	50,8		192.003.11			
4		15	60	192.640.11		192.840.11		
4,76	3/16	19,05	50,8		192.005.11			
5		17	60	192.650.11		192.850.11		
6		22	70	192.060.11		192.860.11		
6,35	1/4	19,05	50,8		192.007.11			
6,35	1/4	25,4	63,5		192.008.11			
7,94	5/16	25,4	76,2					192.501.11
8		22	70			192.080.11		
8		32	80			192.081.11		
9,53	3/8	31,75	76,2					192.503.11
10		32	80			192.800.11	192.900.11	
12		35	80			192.820.11	192.120.11	
12,7	1/2	31,75	76,2					192.505.11
12,7	1/2	38,1	88,9					192.506.11
12,7	1/2	50,8	101,6					192.507.11

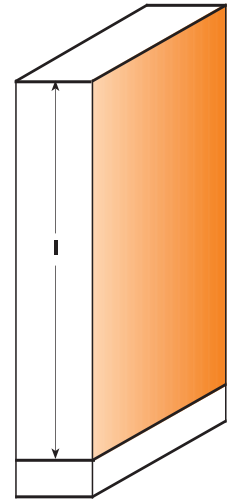


190B
191B
192B



The new line of CMT solid carbide spiral flush trim bits are manufactured with a special super-micro-grain formulation that has increased hardness with a higher transverse rupture point.

Combined with the low helix cutting angle, the new CMT solid carbide spiral flush trim bits with bearings allow the cabinet maker to shear wood and wood products cleanly while providing more efficient chip ejection than standard flush trim bits. In a production setting, these new bits will run cooler and the edge will stay sharper longer which translates into increased productivity for your shop.

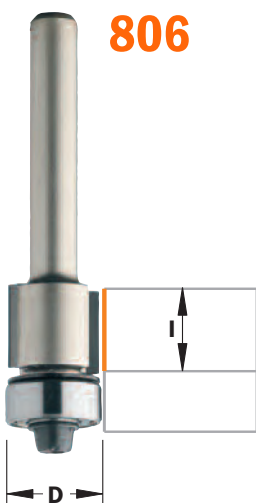


Drawings are 1:1 scale

S=D Cutting diameter		I Cutting length	L Overall length	ORDER NO. Shank Ø 12mm	ORDER NO. Shank Ø 12,7mm
mm	inches	mm	mm		
Z2+2 Upcut & Downcut spiral bits					
12,7	1/2	42	114	190.127.11B	190.508.11B
Z2 Upcut spiral bits					
12,7	1/2	31,7	89		191.505.11B
12,7	1/2	50,8	114	191.127.11B	191.507.11B
Z2 Downcut spiral bits					
12,7	1/2	31,7	89		192.505.11B
12,7	1/2	50,8	114	192.127.11B	192.507.11B

Spare parts: 791.010.00 Ø12,7mm bearing

541.301.00 6mm seeger UNI 7435-6

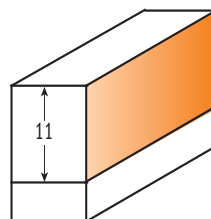


806

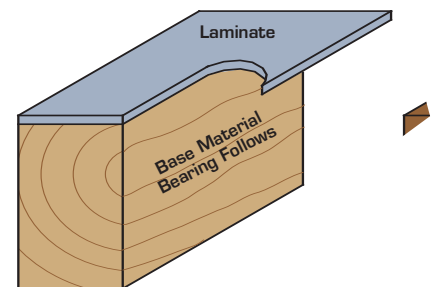


These new super duty DP (polycrystalline diamond) bits represent the ultimate in the extensive line of CMT flush trim bits.

Investing in CMT DP flush trim will save the cabinet manufacturer time and money as they last at least 20x's longer than conventional carbide tipped flush trim bits.



Drawings are 1:1 scale



I Cutting length	D Cutting diameter	Spare Bearing	ORDER NO. Shank Ø 6mm	ORDER NO. Shank Ø 6,35mm	ORDER NO. Shank Ø 8mm
mm	mm				
11	12,7	791.003.00	706.128.61	806.128.61	906.128.61

Spare parts: 990.423.00 Ø12,7mm shield
791.003.00 Ø12,7mm bearing

990.058.00 1/8W screw
991.057.00 3/32" hex key