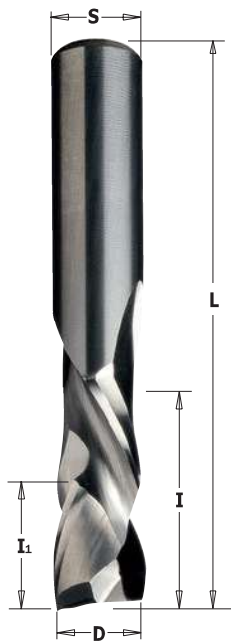
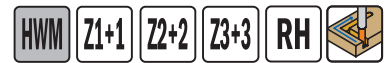


# Solid Carbide Up & Downcut Spiral Bits



## 190



D mm	I mm	I <sub>1</sub> mm	L mm	S mm	Z	PACK Qty.	ORDER NO. Right-hand rotation
4	15	7	50	4	1+1	10	190.040.11
5	22	8	60	5	1+1	10	190.050.11
6	22	8	60	6	1+1	10	190.060.11
8	32	7	80	8	2+2	10	190.080.11
9,52	28,6	7	76,2	9,52	2+2	10	190.504.11
10	32	7	80	10	2+2	10	190.100.11
10	42	7	90	10	2+2	10	190.101.11
12	42	7	90	12	2+2	10	190.120.11
12	52	7	100	12	2+2	10	190.121.11
12,7	25,4	16	76,2	12,7	2+2	10	190.505.11
12,7	28,6	16	76,2	12,7	2+2	10	190.506.11
12,7	34,9	16	88,9	12,7	2+2	10	190.507.11
12,7	41,3	16	101,6	12,7	2+2	10	190.508.11
16	55	24	110	16	2+2	10	190.160.11
18	55	30	110	18	2+2	10	190.180.11

### ...up & downcut mortising bits

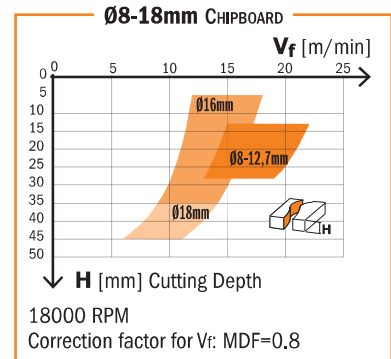
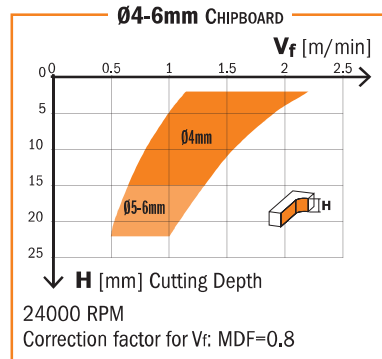
9,52	22,2	4,8	76,2	9,52	2+2	10	190.513.11
9,52	25,4	5,2	76,2	9,52	3+3	10	190.813.11
12	25	5,2	83	12	3+3	10	190.320.11
12,7	22,2	5,2	76,2	12,7	2+2	10	190.515.11
12,7	34,9	5,2	88,9	12,7	2+2	10	190.517.11

### TECHNICAL DETAILS:

- Premium quality HWM.
- 2+2 spiral cutting edges [Z2+2].
- 3+3 spiral cutting edges [Z3+3].
- Provide an excellent finish on both the upper and the lower side of the workpiece.

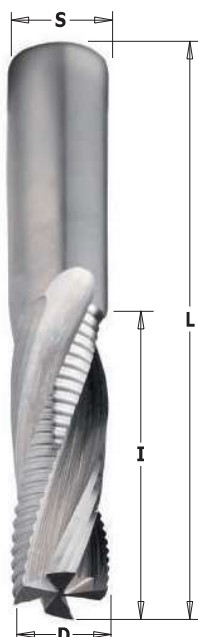
### APPLICATION:

used for cutting, copying, panel sizing and any routing application on 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 boring machines, CNC routers and hand-held routers equipped with chucks or adaptors.



Results shown in this diagram are purely empirical, based merely on informative and hypothetical calculation. Each application may require different parameters in consideration of materials in use and machining conditions. CMT is not responsible for direct, indirect, incidental or consequential damages resulting from any defect, error or failure due to this diagram.

# Solid Carbide Upcut Spiral Bits



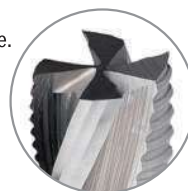
## 197



D mm	I mm	L mm	S mm	PACK Qty.	ORDER NO. Right-hand rotation
12	42	90	12	10	197.121.11
14	50	110	14	1	197.140.11
16	55	110	16	1	197.160.11
16	35	90	16	1	197.161.11
18	55	110	18	1	197.180.11
20	60	120	20	1	197.200.11
20	70	120	20	1	197.201.11

### TECHNICAL DETAILS:

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

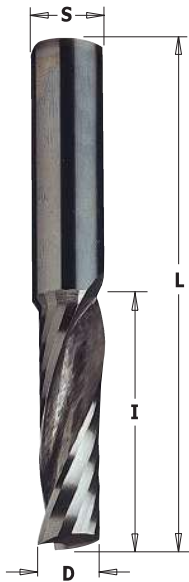


### APPLICATION:

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

**The special 4 flute design (Z2 finishing + Z2R with chipbreaker) allows high speed with excellent finish on the workpiece.**

# Solid Carbide Upcut Spiral Bits



**198**



D mm	I mm	L mm	S mm	PACK QTY.	ORDER NO. Right-hand rotation
3	12	50	3	10	<b>198.030.11</b>
3,18	12,7	50,8	6,35	10	<b>198.001.11</b>
4	15	50	4	10	<b>198.040.11</b>
4,76	15,87	50,8	6,35	10	<b>198.005.11</b>
5	17	50	5	10	<b>198.050.11</b>
6	22	60	6	10	<b>198.060.11</b>
6,35	19,05	50,8	6,35	10	<b>198.007.11</b>
6,35	25,4	63,5	6,35	10	<b>198.008.11</b>
8	22	70	8	10	<b>198.080.11</b>
8	32	80	8	10	<b>198.081.11</b>
9,52	28,57	76,2	9,52	10	<b>198.504.11</b>
10	32	70	10	10	<b>198.100.11</b>
10	42	80	10	10	<b>198.101.11</b>
10	52	90	10	10	<b>198.102.11</b>
12	32	83	12	10	<b>198.120.11</b>

**TECHNICAL DETAILS:**

- Premium quality HWM.
- 1 spiral cutting edge [Z1].
- Provide an excellent finish on the lower side of the workpiece.
- **Upward chip ejection.**

**APPLICATION:**

used for cutting, copying, panel sizing and any routing applications on 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.

# Solid Carbide Downcut Spiral Bits



**198**



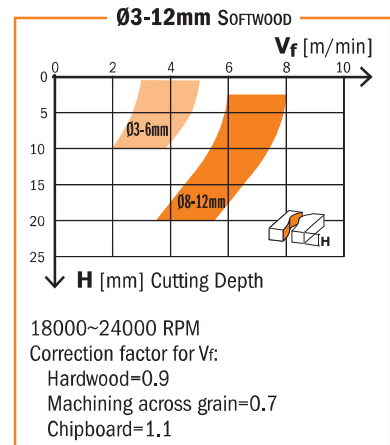
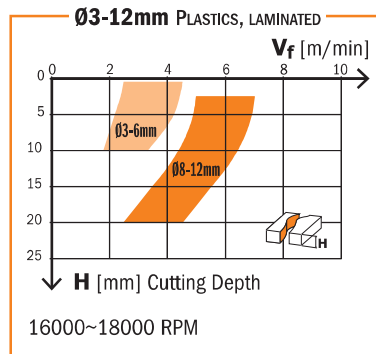
D mm	I mm	L mm	S mm	PACK QTY.	ORDER NO. Right-hand rotation
6	27	60	6	10	<b>198.660.11</b>

**TECHNICAL DETAILS:**

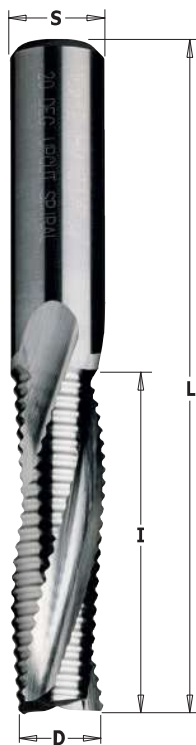
- Premium quality HWM.
- 1 spiral cutting edge [Z1].
- Provide an excellent finish on the bottom side of the workpiece.
- **Downward chip ejection.**

**APPLICATION:**

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



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## 195

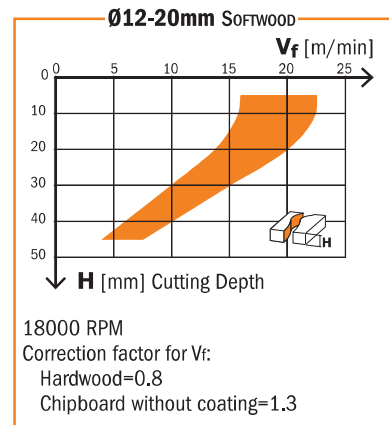
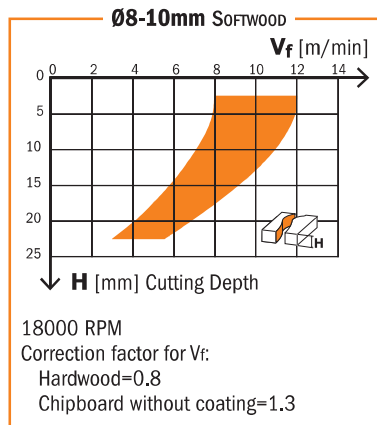
D mm	I mm	L mm	S mm	PACK Qty.	ORDER NO. Right-hand rotation	ORDER NO. Left-hand rotation
8	32	80	8	10	<b>195.081.11</b>	<b>195.081.12</b>
8	42	90	8	10	<b>195.082.11</b>	
10	32	80	10	10	<b>195.100.11</b>	<b>195.100.12</b>
10	42	90	10	10	<b>195.101.11</b>	
12	35	83	12	10	<b>195.120.11</b>	<b>195.120.12</b>
12	42	90	12	10	<b>195.121.11</b>	
12	52	100	12	10	<b>195.122.11</b>	
12,7	38,1	88,9	12,7	1	<b>195.506.11</b>	
14	58	110	14	1	<b>195.140.11</b>	
15,88	54	109,5	15,88	1	<b>195.509.11</b>	
16	55	110	16	1	<b>195.160.11</b>	<b>195.160.12</b>
16	35	90	16	1	<b>195.161.11</b>	
16	72	120	16	1	<b>195.165.11</b>	
18	55	110	18	1	<b>195.180.11</b>	
19,05	54	109,5	19,05	1	<b>195.511.11</b>	
20	60	120	20	1	<b>195.200.11</b>	<b>195.200.12</b>
20	72	120	20	1	<b>195.201.11</b>	
20	102	165	20	1	<b>195.202.11</b>	

### TECHNICAL DETAILS:

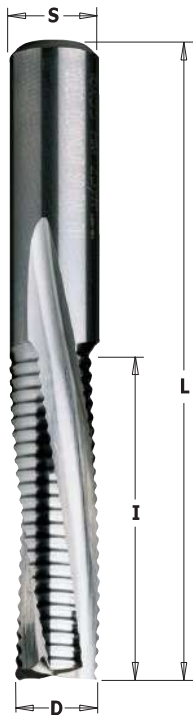
- Premium quality HWM.
- 3 spiral cutting edges [Z3R].
- Chip breaker teeth.
- Max 0.3mm tooth depth.
- Provide an excellent finish on the lower side of the workpiece.
- **Upward chip ejection.**

### APPLICATION:

used for ripping, template routing, panel sizing and any routing application on 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 boring machines, CNC routers and hand-held routers equipped with chucks or adaptors.



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## 196



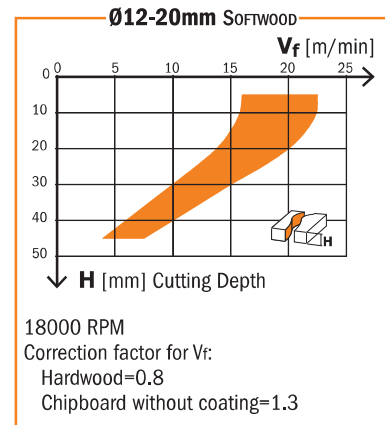
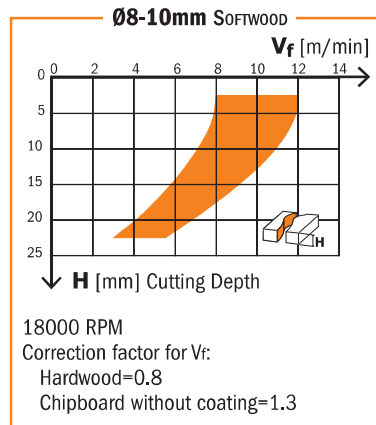
D mm	I mm	L mm	S mm	PACK QTY.	ORDER NO. Right-hand rotation	ORDER NO. Left-hand rotation
8	32	80	8	10	196.081.11	
10	42	90	10	10	196.101.11	
12	35	83	12	10	196.120.11	196.120.12
12	42	90	12	10	196.121.11	
12	52	100	12	10	196.122.11	
12,7	38,1	88,9	12,7	1	196.506.11	
14	50	110	14	1	196.140.11	
15,88	54	109,5	15,88	1	196.509.11	
16	55	110	16	1	196.160.11	196.160.12
18	55	110	18	1	196.180.11	
19,05	54	109,5	19,05	1	196.511.11	
20	60	120	20	1	196.200.11	196.200.12
20	72	120	20	1	196.201.11	

### TECHNICAL DETAILS:

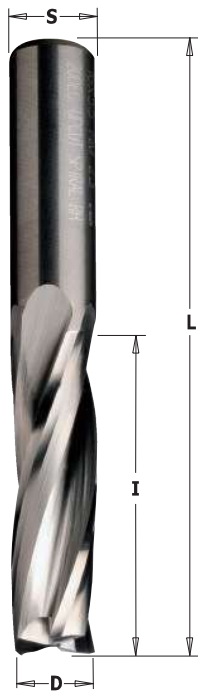
- Premium quality HWM.
- 3 spiral cutting edges [Z3R].
- Chip breaker teeth.
- Max 0.3mm tooth depth.
- Provide excellent finish on the upper side of the workpiece.
- **Downward chip ejection.**

### APPLICATION:

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



Results shown in this diagram are purely empirical, based merely on informative and hypothetical calculation. Each application may require different parameters in consideration of materials in use and machining conditions. CMT is not responsible for direct, indirect, incidental or consequential damages resulting from any defect, error or failure due to this diagram.



## 193



D mm	I mm	L mm	S mm	PACK Qty.	ORDER NO. Right-hand rotation	ORDER NO. Left-hand rotation
8	32	80	8	10	<b>193.081.11</b>	<b>193.081.12</b>
10	32	80	10	10	<b>193.100.11</b>	<b>193.100.12</b>
10	42	90	10	10	<b>193.101.11</b>	
12	35	83	12	10	<b>193.120.11</b>	<b>193.120.12</b>
12	42	90	12	10	<b>193.121.11</b>	
12	52	100	12	10	<b>193.122.11</b>	
14	58	110	14	1	<b>193.140.11</b>	
16	55	110	16	1	<b>193.160.11</b>	<b>193.160.12</b>
16	35	90	16	1	<b>193.161.11</b>	
16	72	120	16	1	<b>193.165.11</b>	
18	55	110	18	1	<b>193.180.11</b>	
20	60	120	20	1	<b>193.200.11</b>	<b>193.200.12</b>
20	70	120	20	1	<b>193.201.11</b>	

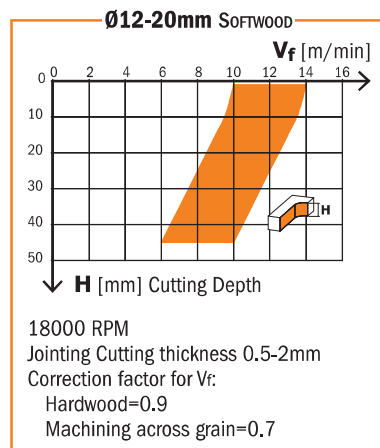
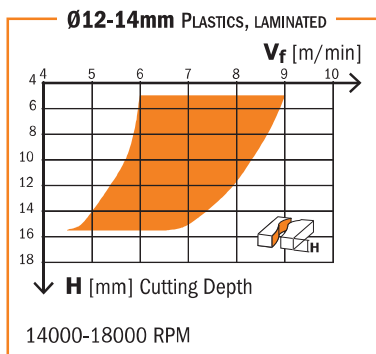
### TECHNICAL DETAILS:

- Premium quality HWM.
- 3 spiral cutting edges [Z3].
- Provide an excellent finish on the lower side of the workpiece.
- **Upward chip ejection.**

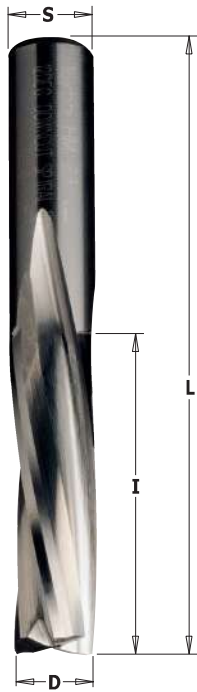
### APPLICATION:

used for ripping, template routing, panel sizing and any routing application on 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 boring machines, CNC routers and hand-held routers equipped with chucks or adaptors.



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## 194



D mm	I mm	L mm	S mm	PACK Qty.	ORDER NO. Right-hand rotation	ORDER NO. Left-hand rotation
10	32	80	10	10	<b>194.100.11</b>	
10	42	90	10	10	<b>194.101.11</b>	
12	35	83	12	10	<b>194.120.11</b>	<b>194.120.12</b>
12	42	90	12	10	<b>194.121.11</b>	
14	50	110	14	1	<b>194.140.11</b>	
16	55	110	16	1	<b>194.160.11</b>	<b>194.160.12</b>
16	35	90	16	1	<b>194.161.11</b>	
18	55	110	18	1	<b>194.180.11</b>	
20	60	120	20	1	<b>194.200.11</b>	<b>194.200.12</b>
20	72	120	20	1	<b>194.201.11</b>	
20	102	165	20	1	<b>194.202.11</b>	

### TECHNICAL DETAILS:

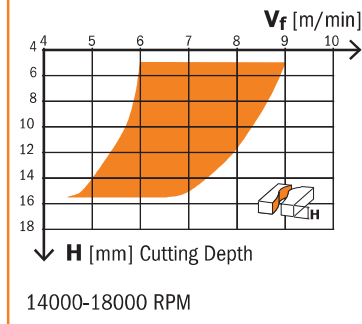
- Premium quality HWM.
- 3 spiral cutting edges [Z3].
- Provide an excellent finish on the upper side of the workpiece.
- **Downward chip ejection.**

### APPLICATION:

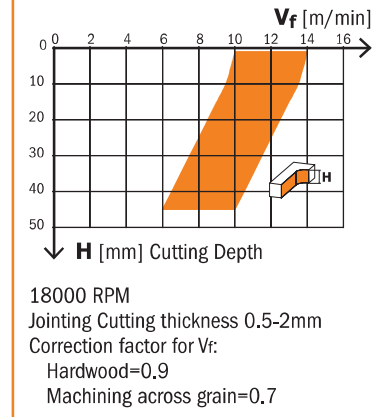
used for ripping, template routing, panel sizing and any ripping application on solid wood, wood composites, plastic materials and laminates. Can be used at a high feed speed on small, difficult to clamp workpieces.

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

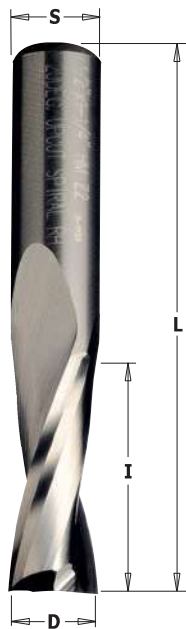
### Ø12-14mm PLASTICS, LAMINATED



### Ø12-20mm SOFTWOOD



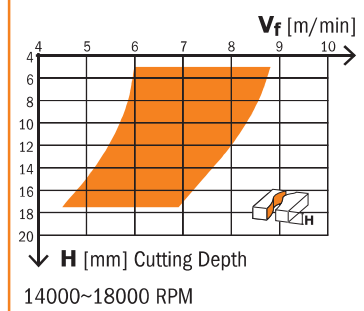
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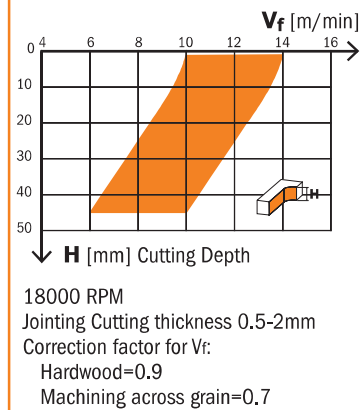
## 191

D mm	I mm	L mm	S mm	PACK QTY.	ORDER NO. Right-hand rotation
3	12	50	3	10	<b>191.030.11</b>
3	12	60	6	10	<b>191.630.11</b>
3	12	60	8	10	<b>191.830.11</b>
3,18	12,7	50,8	6,35	10	<b>191.001.11</b>
3,5	12	60	6	10	<b>191.635.11</b>
3,97	12,7	50,8	6,35	10	<b>191.003.11</b>
4	15	50	4	10	<b>191.040.11</b>
4	15	60	6	10	<b>191.640.11</b>
4	15	60	8	10	<b>191.840.11</b>
4,76	19,05	50,8	6,35	10	<b>191.005.11</b>
5	17	50	5	10	<b>191.050.11</b>
5	17	60	6	10	<b>191.650.11</b>
5	17	60	8	10	<b>191.850.11</b>
6	27	70	6	10	<b>191.060.11</b>
6	27	70	8	10	<b>191.860.11</b>
6,35	19,05	50,8	6,35	10	<b>191.007.11</b>
6,35	25,4	63,5	6,35	10	<b>191.008.11</b>
7	32	80	8	10	<b>191.870.11</b>
7,94	25,4	76,2	12,7	1	<b>191.501.11</b>
8	22	70	8	10	<b>191.080.11</b>
8	32	80	8	10	<b>191.081.11</b>
8	42	90	8	10	<b>191.082.11</b>
9	32	83	12	10	<b>191.890.11</b>
9,52	31,75	76,2	12,7	10	<b>191.503.11</b>
10	32	80	8	10	<b>191.800.11</b>
10	32	80	10	10	<b>191.100.11</b>
10	32	83	12	10	<b>191.900.11</b>
10	42	90	10	10	<b>191.101.11</b>
10	42	90	12	10	<b>191.901.11</b>
12	35	83	8	10	<b>191.820.11</b>
12	35	83	12	10	<b>191.120.11</b>
12	42	90	12	10	<b>191.121.11</b>
12	52	100	12	10	<b>191.122.11</b>
12,7	31,75	76,2	12,7	10	<b>191.505.11</b>
12,7	38,1	88,9	12,7	10	<b>191.506.11</b>
12,7	50,8	101,6	12,7	10	<b>191.507.11</b>
14	50	110	14	1	<b>191.140.11</b>
15,88	55	109,5	15,88	1	<b>191.509.11</b>
16	55	110	16	1	<b>191.160.11</b>
16	35	90	16	1	<b>191.161.11</b>
16	72	120	16	1	<b>191.165.11</b>
19,05	55	109,5	19,05	1	<b>191.511.11</b>
20	72	120	20	1	<b>191.200.11</b>

### Ø12-14mm PLASTICS, LAMINATED



### Ø12-20mm SOFTWOOD



#### TECHNICAL DETAILS:

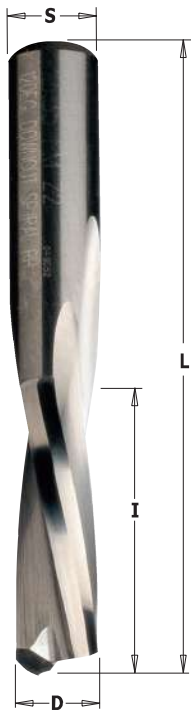
- Premium quality HWM.
- 2 spiral cutting edges [Z2].
- Provide an excellent finish on the lower side of the workpiece.
- **Upward chip ejection.**

#### APPLICATION:

used for ripping, template routing, panel sizing and any routing application on 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 boring machines, CNC routers and hand-held routers equipped with chucks or adaptors.



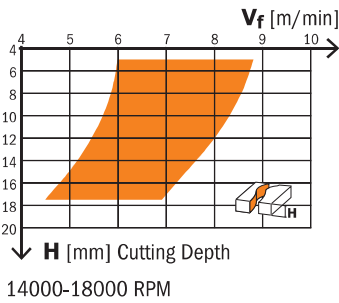
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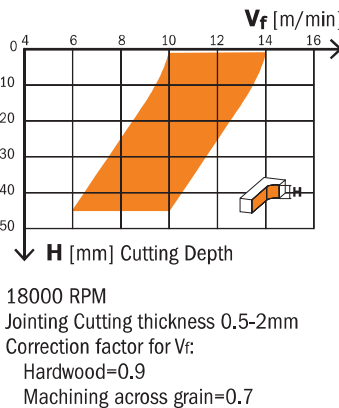
## 192

D mm	I mm	L mm	S mm	PACK Qty.	ORDER NO. Right-hand rotation
3	12	50	3	10	192.030.11
3	12	60	6	10	192.630.11
3	12	60	8	10	192.830.11
3,18	12,7	50,8	6,35	10	192.001.11
3,97	12,7	50,8	6,35	10	192.003.11
4	15	50	4	10	192.040.11
4	15	60	6	10	192.640.11
4	15	60	8	10	192.840.11
4,76	19,05	50,8	6,35	10	192.005.11
5	17	50	5	10	192.050.11
5	17	60	6	10	192.650.11
5	17	60	8	10	192.850.11
6	27	70	6	10	192.060.11
6	27	70	8	10	192.860.11
6,35	19,05	50,8	6,35	10	192.007.11
6,35	25,4	63,5	6,35	10	192.008.11
7,94	25,4	76,2	12,7	10	192.501.11
8	22	70	8	10	192.080.11
8	32	80	8	10	192.081.11
8	42	90	8	10	192.082.11
9,52	31,75	76,2	12,7	10	192.503.11
10	32	80	8	10	192.800.11
10	32	80	10	10	192.100.11
10	42	90	10	10	192.101.11
10	32	83	12	10	192.900.11
12	35	83	8	10	192.820.11
12	35	83	12	10	192.120.11
12,7	31,75	76,2	12,7	10	192.505.11
12,7	38,1	88,9	12,7	10	192.506.11
12,7	50,8	101,6	12,7	10	192.507.11
14	52	110	14	1	192.140.11
16	55	110	16	1	192.160.11

### Ø12-14mm PLASTICS, LAMINATED



### Ø12-20mm SOFTWOOD



#### TECHNICAL DETAILS:

- Premium quality HWM.
- 2 spiral edges [Z2].
- Provide an excellent finish on the upper side of the workpiece.
- **Downward chip ejection.**

#### APPLICATION:

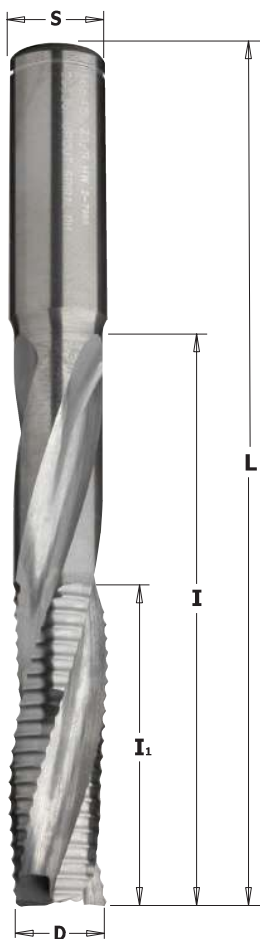
used for ripping, template routing, panel sizing and any routing application on solid wood, wood composites, plastic materials and laminates. Can be used at a high feed speed on small, difficult to clamp work pieces. Can be used on machining centres, point-to-point boring machines, CNC routers and hand-held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



Results shown in this diagram are purely empirical, based merely on informative and hypothetical calculation. Each application may require different parameters in consideration of materials in use and machining conditions. CMT is not responsible for direct, indirect, incidental or consequential damages resulting from any defect, error or failure due to this diagram.



# Solid Carbide Upcut Spiral Bits for Locksets



## 195



D mm	I mm	I <sub>1</sub> mm	L mm	S mm	PACK QTY.	ORDER NO. Right-hand rotation
<b>With Chip-Breaker</b>						
14	95*	45	150	14	1	<b>195.142.11</b>
14	125*	45	170	14	1	<b>195.144.11</b>
16	95*	45	150	16	1	<b>195.162.11</b>
16	120*	50	170	16	1	<b>195.164.11</b>
18	95*	45	150	18	1	<b>195.182.11</b>
<b>Without Chip-Breaker</b>						
16	95*	45	150	16	1	<b>193.162.11</b>

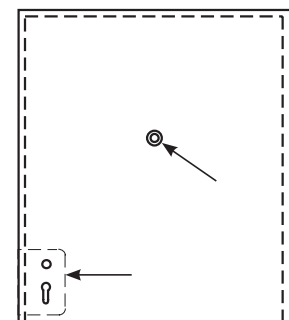
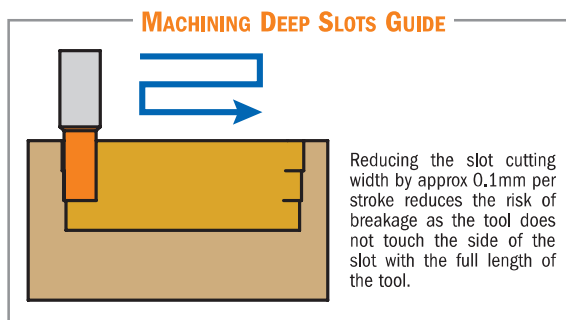
\* The maximum cutting length is achieved in 2-3 passes.

### TECHNICAL DETAILS:

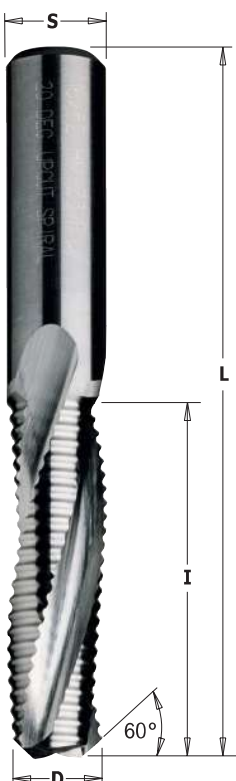
- Premium quality HWM.
- 3 spiral cutting edges [Z3] and [Z3R].
- Max 0.3mm tooth depth.
- Provide an excellent finish on the lower side of the workpiece.
- Seat for seeger ring (not included).
- **Upward chip ejection.**

### APPLICATION:

used for ripping, template routing, panel sizing and any routing application on 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 boring machines, CNC routers and hand-held routers equipped with chucks or adaptors.



# Solid Carbide Upcut with Spiral Bits Chip-Breaker for 60° V-Point Locksets



## 195.143/163



D mm	I mm	L mm	S mm	PACK QTY.	ORDER NO. Right-hand rotation
14	58	110	14	1	<b>195.143.11</b>
16	55	110	16	1	<b>195.163.11</b>

# Solid Carbide Upcut Spiral Bits without Chip-Breaker for 60° V-Point Locksets

## 191.143/163



D mm	I mm	L mm	S mm	PACK QTY.	ORDER NO. Right-hand rotation
14	50	110	14	1	<b>191.143.11</b>
16	55	110	16	1	<b>191.163.11</b>

### TECHNICAL DETAILS:

- Premium quality HWM.
- 3 spiral cutting edges [Z3].
- Provide an excellent finish on the lower side of the workpiece.
- **Upward chip ejection.**

### APPLICATION:

used for ripping, template routing, panel sizing and any routing application on 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 boring machines, CNC routers and hand-held routers equipped with chucks or adaptors.