

**Fresas  
de Metal Duro**

Cutting Technology


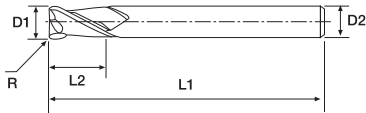





















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# Fresas frontales de Metal duro integral. Micro Grano. Mango largo.

## Solid Carbide end mills. Micro Grain. Long shank.

<b>TN ML-Z2</b>	 <b>Z2</b>	$\lambda_s 35^\circ$	<b>&lt;55HRC</b>	<b>MDI</b> Solid carbide	Co 10% Wc 90%	HV30	grain Ø<0,6 µm	3750 N/mm²																																
<b>TÓRICAS</b> CORNER RADIUS					<table border="1"> <tr> <th>Material</th> <th>GR1</th> <th>GR2</th> <th>GR3</th> <th>GR4</th> <th>GR8</th> <th>GR9</th> <th>GR11</th> </tr> <tr> <td>Subg.</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1</td> <td>2</td> </tr> <tr> <td>condiciones corte cutting conditions</td> <td colspan="7">ver cuadro recomendaciones / see table recommendations</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>air</td> </tr> </table>				Material	GR1	GR2	GR3	GR4	GR8	GR9	GR11	Subg.	1	1-2	1	1-2	1	1	2	condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations														air
Material	GR1	GR2	GR3	GR4	GR8	GR9	GR11																																	
Subg.	1	1-2	1	1-2	1	1	2																																	
condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations																																							
							air																																	
<b>Altplus</b>																																								



Ref.	D1 mm.	R esquina	L2 mm.	L1 mm.	D2	Cod.
RS3532103003R	3	0,3	8	75	3	• 0002854433
RS3532103005R	3	0,5	8	75	3	• 0002501287
RS3532103010R	3	1	8	75	3	• 0002501347
RS3502104003R	4	0,3	10	75	4	• 0003023442
RS3502104005R	4	0,5	10	75	4	• 0002716027
RS3502104010R	4	1	10	75	4	• 0002501408
RS3502104015R	4	1,5	10	75	4	• 0003701914
RS3512106003R	6	0,3	15	100	6	• 0002861384
RS3512106005R	6	0,5	15	100	6	• 0003702093
RS3512106010R	6	1	15	100	6	• 0002501558
RS3512106015R	6	1,5	15	100	6	• 0003702153
RS3512106020R	6	2	15	100	6	• 0002501618
RS3512108003R	8	0,3	20	100	8	• 0003642743
RS3512108005R	8	0,5	20	100	8	• 0002799542
RS3512108010R	8	1	20	100	8	• 0002501779
RS3512108015R	8	1,5	20	100	8	• 0002536454
RS3512108020R	8	2	20	100	8	• 0002501839
RS3512108025R	8	2,5	20	100	8	• 0003702214
RS3512108030R	8	3	20	100	8	• 0003702364
RS3512110003R	10	0,3	25	100	10	• 0003702424
RS3512110005R	10	0,5	25	100	10	• 0002657770
RS3512110010R	10	1	25	100	10	• 0002501980
RS3512110015R	10	1,5	25	100	10	• 0003023593
RS3512110020R	10	2	25	100	10	• 0002502078
RS3512110025R	10	2,5	25	100	10	• 0003702916
RS3512110030R	10	3	25	100	10	• 0003703095
RS3512112003R	12	0,3	30	100	12	• 0003703155
RS3512112005R	12	0,5	30	100	12	• 0003287101
RS3512112010R	12	1	30	100	12	• 0002502129
RS3512112015R	12	1,5	30	100	12	• 0003023653
RS3512112020R	12	2	30	100	12	• 0002502289
RS3512112025R	12	2,5	30	100	12	• 0003703216
RS3512112030R	12	3	30	100	12	• 0003703376

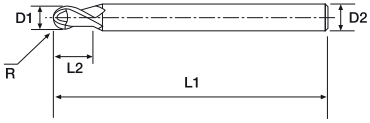


# Fresas frontales de Metal duro integral. Micro Grano. Para aluminio.

## Solid Carbide end mills. Micro Grain. For aluminium.

<b>B AL-Z2</b>	 Z2	$\lambda_s 25^\circ$	<40HRC	<b>MDI</b> Solid carbide	Co 10% Wc 90%	HV30	grain $\varnothing < 0,6 \mu\text{m}$	3750 N/mm <sup>2</sup>
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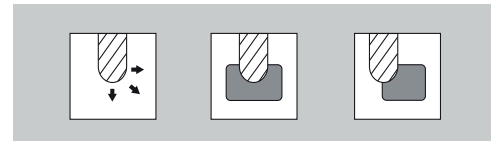
**ESFÉRICA  
BALL TYPE**



Material	<b>GR5</b>	<b>GR6</b>	<b>GR7</b>	<b>GR10</b>	<b>GR11</b>
Subg.	1	1	1	1	1
condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations				
	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	air


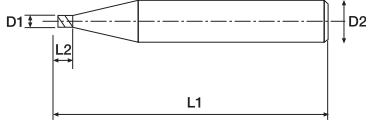









Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	R		Cod.
BE25020010	1	2	50	4	0,50	•	0002681711
BE25020015	1,5	3	50	4	0,75	•	0002681861
BE25020020	2	4	50	4	1,00	•	0002681921
BE25020025	2,5	5	50	4	1,25	•	0002682010
BE25020030	3	6	50	4	1,50	•	0002555056
BE25020035	3,5	7	50	4	1,75	•	0002682161
BE25020040	4	8	50	4	2,00	•	0002555117
BE25120045	4,5	9	50	6	2,25	•	0002682221
BE25120050	5	10	50	6	2,50	•	0002555267
BE25120055	5,5	11	50	6	2,75	•	0002682381
BE25120060	6	12	50	6	3,00	•	0002555328
BE25120080	8	16	60	8	4,00	•	0002682442
BE25120100	10	20	75	10	5,00	•	0002682592
BE25120120	12	24	75	12	6,00	•	0002682652



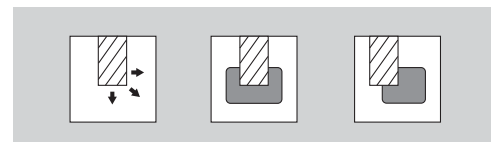
# Fresas frontales de Metal duro integral. Ultra Micro Grano fino.

## Solid Carbide end mills. Ultra fine Micro Grain.

<b>F UMG MINI-Z2</b>	 Z2	$\lambda_s 35^\circ$	<65HRC	<b>UMG-MDI</b> Solid carbide	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>				
PLANA MINIATURA MINIATURE SQUARE TYPE					Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>
<b>Lubeplus</b>					Subg.	1	1-2	1	1-2	1	1	2
					condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations						
												air


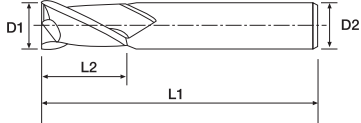



Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	Cod.
AU35022002	0,2	0,4	50	4	• 0003703427
AU35022003	0,3	0,6	50	4	• 0003703587
AU35022004	0,4	0,8	50	4	• 0002899076
AU35022005	0,5	1	50	4	• 0003703647
AU35022006	0,6	1,2	50	4	• 0002899126
AU35022007	0,7	1,4	50	4	• 0003703708
AU35022008	0,8	1,6	50	4	• 0002813528
AU35022009	0,9	1,8	50	4	• 0003703858
AU35022010	1	3	50	4	• 0002813689
AU35022011	1,1	3	50	4	• 0003703918
AU35022012	1,2	3	50	4	• 0003704007
AU35022013	1,3	3	50	4	• 0003704158
AU35022014	1,4	3	50	4	• 0003704218
AU35022015	1,5	4	50	4	• 0002513631
AU35022016	1,6	4	50	4	• 0002643481
AU35022017	1,7	4	50	4	• 0003704378
AU35022018	1,8	4	50	4	• 0003471533
AU35022019	1,9	4	50	4	• 0003704439
AU35022020	2	6	50	4	• 0002512579
AU35022021	2,1	6	50	4	• 0003704640
AU35022022	2,2	6	50	4	• 0003704700
AU35022023	2,3	6	50	4	• 0003704860
AU35022024	2,4	6	50	4	• 0003704911
AU35022025	2,5	8	50	4	• 0002899287
AU35022026	2,6	8	50	4	• 0003705150
AU35022027	2,7	8	50	4	• 0003705210
AU35022028	2,8	8	50	4	• 0003705371
AU35022029	2,9	8	50	4	• 0003705431
AU35022030	3	8	50	4	• 0002512639



# Fresas frontales de Metal duro integral. Ultra Micro Grano fino.

## Solid Carbide end mills. Ultra fine Micro Grain.

<b>F UMG-Z2</b>	 Z2	$\lambda_s 35^\circ$	<65HRC	<b>UMG-MDI</b> Solid carbide	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>				
PLANA SQUARE TYPE					Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>
<b>Lubeplus</b>					Subg.	1	1-2	1	1-2	1	1	2
					condiciones corte / cutting conditions: ver cuadro recomendaciones / see table recommendations							
												


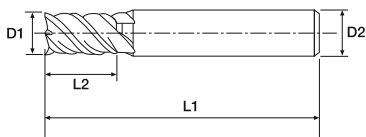










Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.		Cod.
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AU35122040	4	11	50	6	•	0002512789
AU35122045	4,5	11	50	6	•	0003706433
AU35122050	5	13	50	6	•	0002512840
AU35122055	5,5	13	50	6	•	0003706594
AU35122060	6	16	50	6	•	0002512900
AU35122065	6,5	19	60	8	•	0003706644
AU35122070	7	19	60	8	•	0002513089
AU35122075	7,5	19	60	8	•	0003706705
AU35122080	8	20	60	8	•	0002513149
AU35122085	8,5	20	75	10	•	0003706865
AU35122090	9	20	75	10	•	0002513200
AU35122095	9,5	25	75	10	•	0003706925
AU35122100	10	25	75	10	•	0002513360
AU35122105	10,5	25	75	12	•	0003707004
AU35122110	11	25	75	12	•	0002513411
AU35122115	11,5	30	75	12	•	0003707165
AU35122120	12	30	75	12	•	0002513571
AU35122140	14	40	100	14	•	0003707225
AU35122160	16	40	100	16	•	0003707375
AU35122200	20	45	100	20	•	0003707436



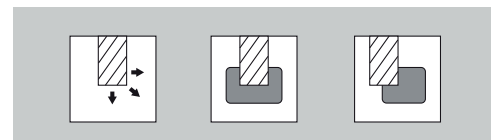
# Fresas frontales de Metal duro integral. Ultra Micro Grano fino.

## Solid Carbide end mills. Ultra fine Micro Grain.

<b>F UMG-Z4</b>	 Z4	$\lambda_s 35^\circ$	<60HRC	<b>UMG-MDI</b> Solid carbide	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>				
PLANA SQUARE TYPE					Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>
<b>Lubeplus</b>					Subg.	1	1-2	1	1-2	1	1	2
					condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations						
												


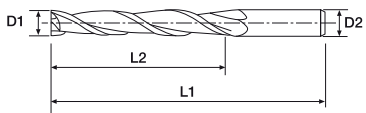























Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	Cod.	
AU35042010	1	3	50	4	•	0002674096
AU35042015	1,5	4	50	4	•	0002674157
AU35042020	2	6	50	4	•	0002651495
AU35042025	2,5	8	50	4	•	0002528380
AU35042030	3	8	50	4	•	0002528440
AU35142035	3,5	10	50	6	•	0002674217
AU35142040	4	11	50	6	•	0002605854
AU35142045	4,5	11	50	6	•	0002674378
AU35142050	5	13	50	6	•	0002605915
AU35142055	5,5	13	50	6	•	0002674428
AU35142060	6	16	50	6	•	0002605583
AU35142065	6,5	19	60	8	•	0002674588
AU35142070	7	19	60	8	•	0002674649
AU35142075	7,5	19	60	8	•	0002674709
AU35142080	8	20	60	8	•	0002606093
AU35142085	8,5	20	75	10	•	0002674850
AU35142090	9	20	75	10	•	0002674910
AU35142095	9,5	25	75	10	•	0002675009
AU35142100	10	25	75	10	•	0002606154
AU35142110	11	25	75	12	•	0002675210
AU35142120	12	30	75	12	•	0002512418
AU35142140	14	35	75	14	•	0002675430
AU35142160	16	40	100	16	•	0002675581
AU35142200	20	45	100	20	•	0002675641



# Fresas frontales de Metal duro integral. Ultra Micro Grano fino. Canal largo.

## Solid Carbide end mills. Ultra fine Micro Grain. Long flute.

<b>F UMG CL-Z4</b>	 Z4	$\lambda_s 35^\circ$	<60HRC	<b>UMG-MDI</b> Solid carbide	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>																																
PLANA SQUARE TYPE					<table border="1"> <tr> <th>Material</th> <th>GR1</th> <th>GR2</th> <th>GR3</th> <th>GR4</th> <th>GR8</th> <th>GR9</th> <th>GR11</th> </tr> <tr> <td>Subg.</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1</td> <td>2</td> </tr> <tr> <td>condiciones corte cutting conditions</td> <td colspan="7">ver cuadro recomendaciones / see table recommendations</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>air</td> </tr> </table>				Material	GR1	GR2	GR3	GR4	GR8	GR9	GR11	Subg.	1	1-2	1	1-2	1	1	2	condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations														air
Material	GR1	GR2	GR3	GR4	GR8	GR9	GR11																																	
Subg.	1	1-2	1	1-2	1	1	2																																	
condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations																																							
							air																																	
<b>Lubeplus</b>																																								




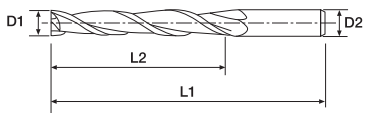





















Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	Cod.
AUF35042010005	1	5	50	4	• 0002664621
AUF35042015006	1,5	6	50	4	• 0002664841
AUF35042020009	2	9	50	4	• 0002664781
AUF35042025010	2,5	10	50	4	• 0002664902
AUF35142030012	3	12	50	6	• 0002665081
AUF35142035014	3,5	14	50	6	• 0002665141
AUF35142040016	4	16	60	6	• 0002665201
AUF35142045018	4,5	18	60	6	• 0002665352
AUF35142050025	5	25	75	6	• 0002665412
AUF35142060025	6	25	75	6	• 0002665572
AUF35142070030	7	30	75	8	• 0002665633
AUF35142080035	8	35	100	8	• 0002665783
AUF35142100040	10	40	100	10	• 0002665844
AUF35142120045	12	45	100	12	• 0002665904
AUF35142140045	14	45	100	14	• 0002666083
AUF35142160065	16	65	150	16	• 0002666143
AUF35142200075	20	75	150	20	• 0002668148





# Fresas frontales de Metal duro integral. Ultra Micro Grano fino. Canal largo.

## Solid Carbide end mills. Ultra fine Micro Grain. Long flute.

<b>F UMG CL-Z4</b>	 Z4	$\lambda_s 35^\circ$	<60HRC	<b>UMG-MDI</b> Solid carbide	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>																																
PLANA SQUARE TYPE					<table border="1"> <tr> <td>Material</td> <td><b>GR1</b></td> <td><b>GR2</b></td> <td><b>GR3</b></td> <td><b>GR4</b></td> <td><b>GR8</b></td> <td><b>GR9</b></td> <td><b>GR11</b></td> </tr> <tr> <td>Subg.</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1</td> <td>2</td> </tr> <tr> <td>condiciones corte cutting conditions</td> <td colspan="7">ver cuadro recomendaciones / see table recommendations</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>air</td> </tr> </table>				Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>	Subg.	1	1-2	1	1-2	1	1	2	condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations														air
Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>																																	
Subg.	1	1-2	1	1-2	1	1	2																																	
condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations																																							
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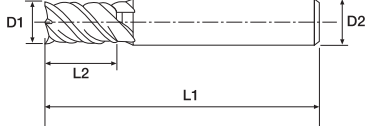























Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	Cod.
AUF35042010005	1	5	50	4	• 0002664621
AUF35042015006	1,5	6	50	4	• 0002664841
AUF35042020009	2	9	50	4	• 0002664781
AUF35042025010	2,5	10	50	4	• 0002664902
AUF35142030012	3	12	50	6	• 0002665081
AUF35142035014	3,5	14	50	6	• 0002665141
AUF35142040016	4	16	60	6	• 0002665201
AUF35142045018	4,5	18	60	6	• 0002665352
AUF35142050025	5	25	75	6	• 0002665412
AUF35142060025	6	25	75	6	• 0002665572
AUF35142070030	7	30	75	8	• 0002665633
AUF35142080035	8	35	100	8	• 0002665783
AUF35142100040	10	40	100	10	• 0002665844
AUF35142120045	12	45	100	12	• 0002665904
AUF35142140045	14	45	100	14	• 0002666083
AUF35142160065	16	65	150	16	• 0002666143
AUF35142200075	20	75	150	20	• 0002668148



## Fresas frontales de Metal duro integral / Solid Carbide end mills.

Ultra Micro Grano fino. Altas velocidades y aceros templados. / *Ultra fine Micro Grain. High speed and tempered steels.*


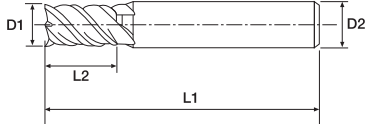





















<b>F UMG HRC</b>	 Z4-Z6-Z8	$\lambda_s 45^\circ$	<60HRC	<b>UMG-MDI</b> <i>Solid carbide</i>	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>																																																																																								
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Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>																																																																																									
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<b>Lubepius</b>	<table border="1"> <thead> <tr> <th>Ref.</th> <th>D1 mm.</th> <th>L2 mm.</th> <th>L1 mm.</th> <th>D2 mm.</th> <th>nº cortes</th> <th></th> <th>Cod.</th> </tr> </thead> <tbody> <tr><td>AU45042020</td><td>2</td><td>4</td><td>50</td><td>4</td><td>4</td><td>•</td><td>0002474125</td></tr> <tr><td>AU45042030</td><td>3</td><td>6</td><td>50</td><td>6</td><td>4</td><td>•</td><td>0002474276</td></tr> <tr><td>AU45142040</td><td>4</td><td>8</td><td>50</td><td>6</td><td>4</td><td>•</td><td>0002474336</td></tr> <tr><td>AU45162050</td><td>5</td><td>10</td><td>50</td><td>6</td><td>6</td><td>•</td><td>0002474496</td></tr> <tr><td>AU45162060</td><td>6</td><td>15</td><td>50</td><td>6</td><td>6</td><td>•</td><td>0002474557</td></tr> <tr><td>AU45162080</td><td>8</td><td>20</td><td>60</td><td>8</td><td>6</td><td>•</td><td>0002474617</td></tr> <tr><td>AU45162100</td><td>10</td><td>30</td><td>75</td><td>10</td><td>6</td><td>•</td><td>0002474767</td></tr> <tr><td>AU45162120</td><td>12</td><td>32</td><td>75</td><td>12</td><td>6</td><td>•</td><td>0002474828</td></tr> <tr><td>AU45162160</td><td>16</td><td>40</td><td>100</td><td>16</td><td>6</td><td>•</td><td>0002474988</td></tr> <tr><td>AU45182200</td><td>20</td><td>45</td><td>100</td><td>20</td><td>8</td><td>•</td><td>0003707596</td></tr> </tbody> </table>								Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	nº cortes		Cod.	AU45042020	2	4	50	4	4	•	0002474125	AU45042030	3	6	50	6	4	•	0002474276	AU45142040	4	8	50	6	4	•	0002474336	AU45162050	5	10	50	6	6	•	0002474496	AU45162060	6	15	50	6	6	•	0002474557	AU45162080	8	20	60	8	6	•	0002474617	AU45162100	10	30	75	10	6	•	0002474767	AU45162120	12	32	75	12	6	•	0002474828	AU45162160	16	40	100	16	6	•	0002474988	AU45182200	20	45	100	20	8	•	0003707596
Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	nº cortes		Cod.																																																																																									
AU45042020	2	4	50	4	4	•	0002474125																																																																																									
AU45042030	3	6	50	6	4	•	0002474276																																																																																									
AU45142040	4	8	50	6	4	•	0002474336																																																																																									
AU45162050	5	10	50	6	6	•	0002474496																																																																																									
AU45162060	6	15	50	6	6	•	0002474557																																																																																									
AU45162080	8	20	60	8	6	•	0002474617																																																																																									
AU45162100	10	30	75	10	6	•	0002474767																																																																																									
AU45162120	12	32	75	12	6	•	0002474828																																																																																									
AU45162160	16	40	100	16	6	•	0002474988																																																																																									
AU45182200	20	45	100	20	8	•	0003707596																																																																																									



## Fresas frontales de Metal duro integral / Solid Carbide end mills.

Ultra Micro Grano fino. Altas velocidades y aceros templados. Canal largo.


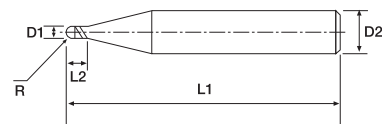








*Ultra fine Micro Grain. High speed and tempered steels. Long flute.*

<b>F UMG HRC ML</b>	 Z6-Z8	$\lambda_s 45^\circ$	<60HRC	<b>UMG-MDI</b> <i>Solid carbide</i>	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>																																																								
<b>PLANA</b> <b>SQUARE TYPE</b>			<table border="1"> <tr> <td>Material</td> <td><b>GR1</b></td> <td><b>GR2</b></td> <td><b>GR3</b></td> <td><b>GR4</b></td> <td><b>GR8</b></td> <td><b>GR9</b></td> <td><b>GR11</b></td> </tr> <tr> <td>Subg.</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1</td> <td>2</td> </tr> <tr> <td>condiciones corte cutting conditions</td> <td colspan="7">ver cuadro recomendaciones / see table recommendations</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>air</td> </tr> </table>						Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>	Subg.	1	1-2	1	1-2	1	1	2	condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations														air																								
Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>																																																									
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Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	nº cortes		Cod.																																																									
AUF45162060025	6	25	75	6	6	•	0002475067																																																									
AUF45162080030	8	30	75	8	6	•	0002475559																																																									
AUF45162100045	10	45	100	10	6	•	0002475288																																																									
AUF45162120045	12	45	100	12	6	•	0002475338																																																									
AUF45162160065	16	65	150	16	6	•	0002475499																																																									
AUF45182200075	20	75	150	20	8	•	0002536725																																																									



# Fresas frontales de Metal duro integral. Ultra Micro Grano fino.

## Solid Carbide end mills. Ultra fine Micro Grain.

<b>B UMG MINI-Z2</b>	 Z2	$\lambda_s 35^\circ$	<60HRC	<b>UMG-MDI</b> Solid carbide	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>					
ESFÉRICA MINIATURA MINIATURE BALL TYPE					Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>	
<b>Lubeplus</b>					Subg.	1	1-2	1	1-2	1	1	2	
					condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations							
													air


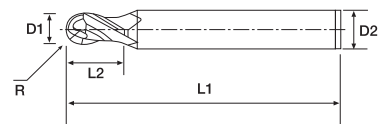























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BU35022004	0,4	0,8	50	4	0,20	• 0002666785
BU35022005	0,5	1	50	4	0,25	• 0002606214
BU35022006	0,6	1,2	50	4	0,30	• 0002502340
BU35022007	0,7	1,4	50	4	0,35	• 0002565557
BU35022008	0,8	1,6	50	4	0,40	• 0002502400
BU35022009	0,9	1,8	50	4	0,45	• 0002666846
BU35022010	1	2	50	4	0,50	• 0002666414
BU35022011	1,1	2,2	50	4	0,55	• 0003707656
BU35022012	1,2	2,4	50	4	0,60	• 0003090503
BU35022013	1,3	2,6	50	4	0,65	• 0003707707
BU35022014	1,4	2,8	50	4	0,70	• 0003707867
BU35022015	1,5	3	50	4	0,75	• 0002853581
BU35022016	1,6	3,2	50	4	0,80	• 0003707928
BU35022017	1,7	3,4	50	4	0,85	• 0003708006
BU35022018	1,8	3,6	50	4	0,90	• 0003708167
BU35022019	1,9	3,8	50	4	0,95	• 0003708227
BU35022020	2	4	50	4	1,00	• 0002486298
BU35022021	2,1	4,2	50	4	1,05	• 0003708378
BU35022022	2,2	4,4	50	4	1,10	• 0003708438
BU35022023	2,3	4,6	50	4	1,15	• 0003708598
BU35022024	2,4	4,8	50	4	1,20	• 0003708659
BU35022025	2,5	5	50	4	1,25	• 0002537025
BU35022026	2,6	5,2	50	4	1,30	• 0003708719
BU35022027	2,7	5,4	50	4	1,35	• 0003708860
BU35022028	2,8	5,6	50	4	1,40	• 0003709009
BU35022029	2,9	5,8	50	4	1,45	• 0003709169
BU35022030	3	6	50	4	1,50	• 0002537185



# Fresas frontales de Metal duro integral. Ultra Micro Grano fino.

## Solid Carbide end mills. Ultra fine Micro Grain.

<b>B UMG-Z2</b>	 Z2	$\lambda_s 35^\circ$	<60HRC	<b>UMG-MDI</b> Solid carbide	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>																																	
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Material	GR1	GR2	GR3	GR4	GR8	GR9	GR11																																		
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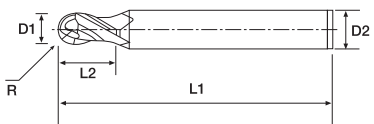























Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	R	Cod.
BU35022035	3,5	7	50	4	1,75	• 0002537245
BU35022040	4	8	50	4	2,00	• 0002512087
BU35122045	4,5	9	50	6	2,25	• 0002537396
BU35122050	5	10	50	6	2,50	• 0002498432
BU35122055	5,5	11	50	6	2,75	• 0002537456
BU35122060	6	12	50	6	3,00	• 0002486359
BU35122070	7	14	60	8	3,50	• 0003709380
BU35122080	8	16	60	8	4,00	• 0002667145
BU35122090	9	18	75	10	4,50	• 0002667085
BU35122100	10	20	75	10	5,00	• 0002667206
BU35122120	12	24	75	12	6,00	• 0002536514
BU35122140	14	28	100	14	7,00	• 0003709430
BU35122160	16	32	100	16	8,00	• 0002835610
BU35122180	18	36	100	20	9,00	- 0003709591
BU35122200	20	40	100	20	10,00	- 0003709651



# Fresas frontales de Metal duro integral. Ultra Micro Grano fino.

## Solid Carbide end mills. Ultra fine Micro Grain.

<b>B UMG-Z4</b>	 Z4	$\lambda_s 35^\circ$	<60HRC	<b>UMG-MDI</b> Solid carbide	Co 12% Wc 87%	HRA 92,1	grain $\varnothing < 0,4 \mu\text{m}$	3800 N/mm <sup>2</sup>																																
<b>ESFÉRICA BALL TYPE</b>					<table border="1"> <tr> <td>Material</td> <td><b>GR1</b></td> <td><b>GR2</b></td> <td><b>GR3</b></td> <td><b>GR4</b></td> <td><b>GR8</b></td> <td><b>GR9</b></td> <td><b>GR11</b></td> </tr> <tr> <td>Subg.</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1-2</td> <td>1</td> <td>1</td> <td>2</td> </tr> <tr> <td>condiciones corte cutting conditions</td> <td colspan="7">ver cuadro recomendaciones / see table recommendations</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>air</td> </tr> </table>				Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>	Subg.	1	1-2	1	1-2	1	1	2	condiciones corte cutting conditions	ver cuadro recomendaciones / see table recommendations														air
Material	<b>GR1</b>	<b>GR2</b>	<b>GR3</b>	<b>GR4</b>	<b>GR8</b>	<b>GR9</b>	<b>GR11</b>																																	
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Ref.	D1 mm.	L2 mm.	L1 mm.	D2 mm.	R	Cod.
BU35042010	1	2	50	4	0,50	• 0002734602
BU35042015	1,5	3	50	4	0,75	• 0003709711
BU35042020	2	4	50	4	1,00	• 0002734541
BU35042025	2,5	5	50	4	1,25	• 0003709862
BU35042030	3	6	50	4	1,50	• 0002705388
BU35042035	3,5	7	50	4	1,75	• 0003709922
BU35042040	4	8	50	4	2,00	• 0002745612
BU35042045	4,5	9	50	6	2,25	• 0003710006
BU35142050	5	10	50	6	2,50	• 0002667417
BU35142055	5,5	11	50	6	2,75	• 0003710167
BU35142060	6	12	50	6	3,00	• 0002667366
BU35142070	7	14	60	8	3,50	• 0002612358
BU35142080	8	16	60	8	4,00	• 0002666575
BU35142090	9	18	75	10	4,50	• 0003710227
BU35142100	10	20	75	10	5,00	• 0002669421
BU35142120	12	24	75	12	6,00	• 0003710388
BU35142140	14	28	100	14	7,00	• 0003710438
BU35142160	16	32	100	16	8,00	• 0003710598
BU35142200	20	40	100	20	10,00	- 0003710659





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Cutting Technology

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