



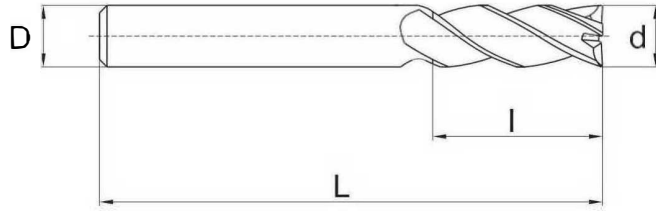
**SHÓSAI**  
HIGH PERFORMANCE



**Carbide End Mills**

# PLAIN CARBIDE END MILL

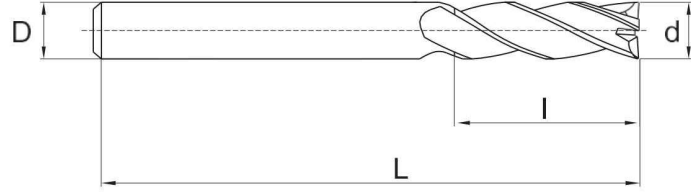
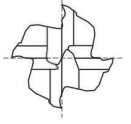
**55 HRC**



ORDER NO	d	l	D	L	Z	FİYAT
GR550010	1	3	3	50	4	\$11,00
GR550015	1,5	5	3	50	4	\$11,00
GR550020	2	7	3	50	4	\$11,00
GR550025	2,5	8	3	50	4	\$11,00
GR550030	3	10	3	50	4	\$11,00
GR550035	3,5	10	4	50	4	\$13,00
GR5500	4	14	4	50	4	\$13,00
GR550050	5	16	5	50	4	\$13,50
GR550060	6	19	6	60	4	\$15,50
GR550070	7	19	7	60	4	\$25,20
GR550080	8	20	8	60	4	\$25,20
GR550090	9	20	10	75	4	\$43,80
GR550100	10	25	10	75	4	\$43,80
GR550110	11	25	12	75	4	\$55,10
GR550120	12	30	12	75	4	\$54,60
GR550130	13	30	14	75	4	\$107,00
GR550140	14	45	14	100	4	\$107,20
GR550150	15	45	16	100	4	\$128,70
GR550160	16	45	16	100	4	\$132,20
GR550180	18	45	18	100	4	\$164,10
GR550200	20	45	20	100	4	\$195,50
GR556020	2	6	6	50	4	\$16,80
GR556030	3	8	6	50	4	\$16,80
GR556040	4	11	6	50	4	\$16,80
GR550410	1	3	4	50	4	\$13,00
GR550415	1,5	5	4	50	4	\$13,00
GR550420	2	7	4	50	4	\$13,00
GR550425	2,5	8	4	50	4	\$13,00
GR550430	3	10	4	50	4	\$13,00

# CARBIDE 4 FLUTE LONG

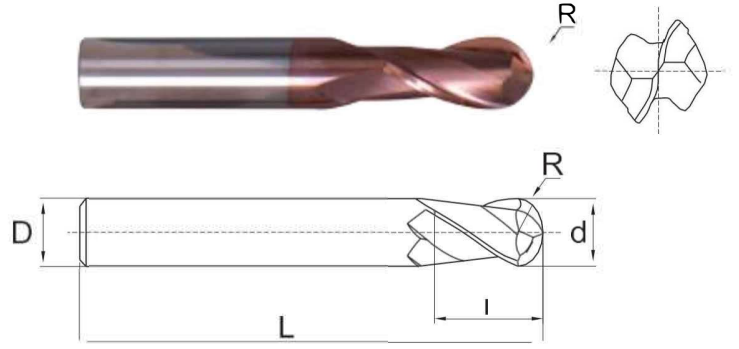
**55 HRC**



ORDER NO	d	l	D	L	Z	FİYAT
GR551030	3	20	3	60	4	\$16,50
GR551040	4	20	4	75	4	\$16,50
GR551050	5	25	5	75	4	\$18,10
GR551050	6	30	6	75	4	\$23,20
GR552030	3	25	3	75	4	\$17,90
GR552060	6	40	6	100	4	\$32,80
GR552080	8	40	8	100	4	\$47,40
GR552100	10	45	10	100	4	\$65,50
GR552120	12	45	12	100	4	\$86,20
GR553080	8	75	8	150	4	\$83,10
GR553100	10	75	10	150	4	\$117,20
GR553120	12	75	12	150	4	\$144,50
GR553140	14	75	14	150	4	\$199,40
GR553160	16	75	16	150	4	\$210,70
GR553180	18	75	18	150	4	\$244,10
GR553200	20	75	20	150	4	\$294,40

## CARBİDE 2 FLUTE BALL NOSE

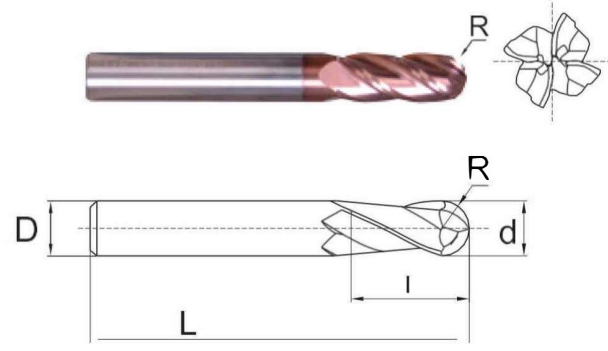
**55 HRC**



ORDER NO	RADÜS	d	l	D	L	Z	FİYAT
GR505010	R 0.5	1	3	3	39	2	\$12,40
GR505015	R 0.75	1,5	6	3	39	2	\$12,40
GR505020	R 1.0	2	7	3	39	2	\$12,40
GR505025	R 1.25	2,5	7	3	39	2	\$12,40
GR505030	R 1.50	3	9	3	39	2	\$12,40
GR515010	R 0.5	1	3	3	50	2	\$13,50
GR515015	R 0.75	1,5	6	3	50	2	\$13,50
GR515020	R 1.0	2	7	3	50	2	\$13,50
GR515025	R 1.25	2,5	7	3	50	2	\$13,50
GR515030	R 1.50	3	12	3	50	2	\$13,50
GR515040	R 2.0	4	14	4	50	2	\$14,70
GR515050	R 2.5	5	15	5	50	2	\$15,20
GR515060	R 3.0	6	19	6	60	2	\$19,90
GR515080	R 4	8	20	8	60	2	\$28,50
GR515100	R 5.0	10	20	10	75	2	\$42,50
GR515120	R 6.0	12	24	12	75	2	\$54,70
GR515140	R 7.0	14	28	14	100	2	\$111,90
GR515160	R 8.0	16	32	16	100	2	\$134,20

## LONG CARBIDE BALL NOSE

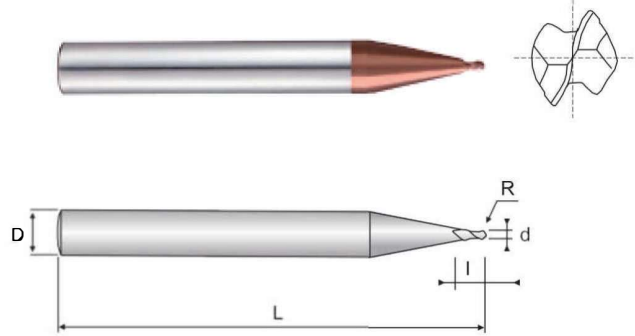
**55HRC**



ORDER NO	RADÜS	d	I	D	L	Z	FİYAT
GR525030	R 1.		9	3	50	4	\$14,00
GR525040	R 2.0	4	14	4	50	4	\$14,50
GR525050	R 2.		16	5	50	4	\$17,60
GR525060	R 3.0	6	19	6	60	4	\$22,20
GR525080	R 4.0	8	20	8	60	4	\$30,90
GR525100	R 5.0	10	25	10	75	4	\$49,70
GR525120	R 6.0	12	25	12	75	4	\$64,00

## SHORT LENGTH BALL NOSE

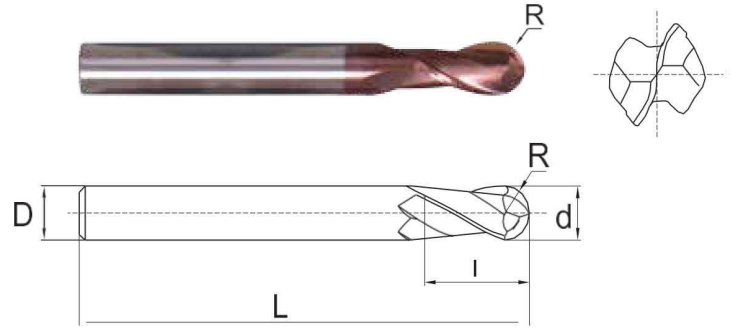
**55 HRC**



ORDER NO	RADÜS	d	I	D	L	Z	FİYAT
GR5501020	R 0.		1,2	6	5	2	\$30,00
GR5501212	R0.6	1,2	1,2	6	50	2	\$30,00
GR5501530	R0.75	1,5	3	6	50	2	\$30,00
GR5502020	R1.0	2	2	6	50	2	\$30,00
GR5502040	R1.0	2	4	6	50	2	\$30,00
GR5503060	R1.5	3	6	6	50	2	\$30,00

## CARBİDE LONG BALL NOSE

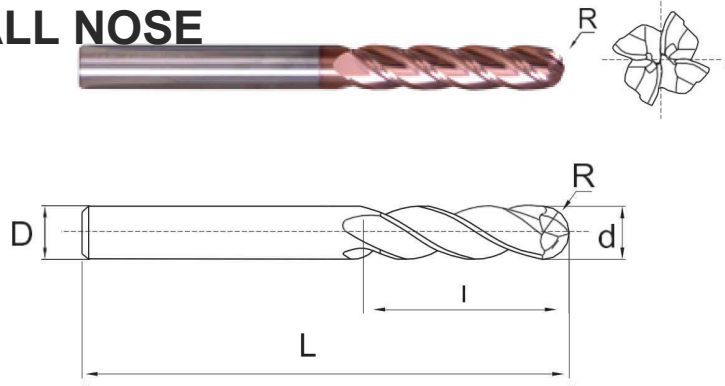
**55 HRC**



ORDER NO	RADÜS	d	I	D	L	Z	FİYAT
GR535020	R1	2	4	3	75	2	\$15,60
GR535025	R1,2	2,5	5	3	75	2	\$15,60
GR535030	R1,5	3	6	3	75	2	\$15,60
GR535040	R2	4	8	4	75	2	\$15,60
GR535050	R3	5	12	5	75	2	\$27,10
GR545050	R3	6	35	6	100	2	\$30,90
GR545080	R4	8	35	8	100	2	\$49,20
GR545100	R5	10	45	10	100	2	\$65,50
GR545120	R6	12	45	12	100	2	\$87,30

## CARBİDE EXTRA LONG BALL NOSE

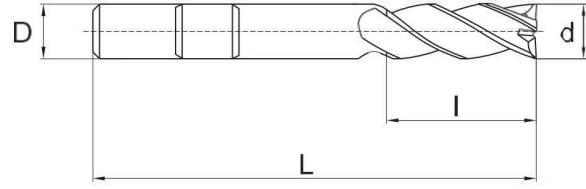
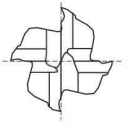
**55 HRC**



ORDER NO	RADÜS	d	I	D	L	Z	FİYAT
GR555100	R5	10	75	10	150	4	\$123,20
GR555120	R6	12	75	12	150	4	\$159,80
GR555160	R8	16	75	16	150	4	\$268,70

## UNEQUAL HELIX CARBIDE END MILL

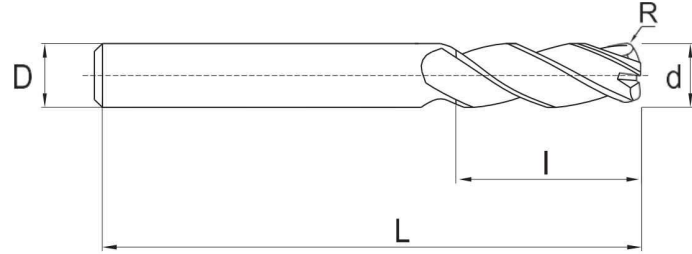
**55 HRC**



ORDER NO	d	l	D	L	Z	FİYAT
GR554F040	4	11	6	60	4	\$26,00
GR554F050	5	13	6	60	4	\$26,00
GR554F060	6	15	6	6	4	\$26,00
GR554F080	8	22	8	75	4	\$43,50
GR554F100	10	25	10	75	4	\$62,20
GR554F120	12	30	12	83	4	\$80,50
GR554F140	14	30	14	83	4	\$120,20
GR554F160	16	35	16	92	4	\$149,50
GR554F200	20	38	20	100	4	\$228,10

## CORNER RADIUS CARBIDE END MILL

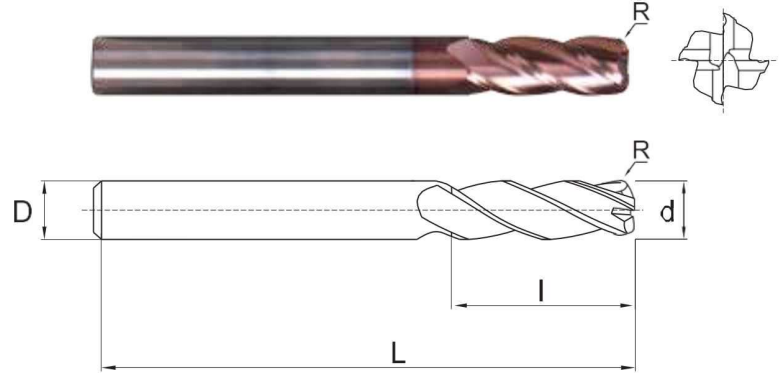
**55 HRC**



ORDER NO	K. RADÜS	d	l	D	L	Z	FİYAT
GR558020-0.5	R 0.	2	6	3	50	4	\$13,00
GR558030-0.5	R 0.5	3	8	3	50	4	\$13,50
GR558030-1.0	R 1	3	8	3	50	4	\$13,50
GR558040-0.5	R 0.5	4	10	4	50	4	\$14,30
GR558040-1.0	R 1	4	10	4	50	4	\$14,30
GR558050-0.5	R 0.5	5	10	5	50	4	\$18,80
GR558050-1.0	R 1	5	10	5	50	4	\$18,80
GR558060-0.5	R 0.5	6	13	6	50	4	\$20,90
GR558060-1	R 1	6	13	6	50	4	\$20,90
GR558060-2	R 2	6	13	6	50	4	\$20,90
GR558080-0.5	R 0.5	8	20	8	60	4	\$30,70
GR558080-1	R 1	8	20	8	60	4	\$30,70
GR558080-2	R 2	8	20	8		4	\$30,70
GR558100-0.5	R 0.5	10	25	10	75	4	\$49,10
GR558100-1	R 1	10	25	10	75	4	\$ 9,10
GR558100-2	R 2	10	25	10	75	4	\$49,10
GR558120-0.5	R 0.5	12	30	12	75	4	\$62,90
GR558120-1	R 1	12	30	12	75	4	\$62,90
GR558120-2	R 2	12	30	12	75	4	\$62,90
GR558140-0.5	R 0.5	14	35	14	100	4	\$131,20

# LONG CORNER RADUIS CARBIDE END MİLL

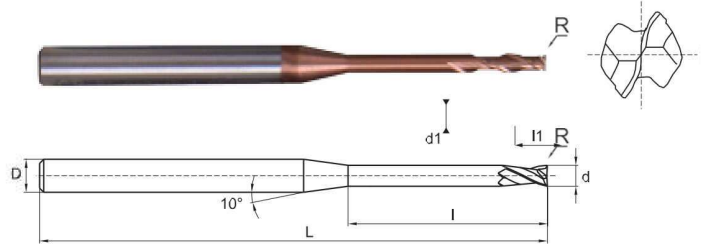
**55 HRC**



ORDER NO	K. RADÜS	d	l	D	L	Z	FİYAT
GR559030-0.5	R 0.5	3	8	3	75	4	\$15,70
GR559030-1.0	R 1	3	8	3	75	4	\$15,70
GR559040-0.5	R 0.5	4	10	4	75	4	\$15,70
GR559040-1.0	R 1	4	10	4	75	4	\$15,70
GR559050-0.5	R 0.5	5	12	6	75	4	\$31,80
GR559050-1.0	R 1	5	12	6	75	4	\$31,80
GR559060-0.5	R 0.5	6	15	6	100	4	\$31,80
GR559060-1	R 1	6	15	6	100	4	\$31,80
GR559060-2	R 2	6	15	6	100	4	\$31,80
GR559080-0.5	R 0.5	8	20	8	100	4	\$47,30
GR559080-1	R 1	8	20	8	100	4	\$47,30
GR559080-2	R 2	8	20	8	100	4	\$47,30
GR559100-0.5	R 0.5	10	20	10	100	4	\$63,90
GR559100-1	R 1	10	20	10	100	4	\$63,90
GR559100-2	R 2	10	20	10	100	4	\$63,90
GR559120-0.5	R 0.5	12	30	12	100	4	\$84,90
GR559120-1	R 1	12	30	12	100	4	\$84,90
GR559120-2	R 2	12	30	12	100	4	\$84,90

# CORNER RADUIS LONG NECKS END MİLL

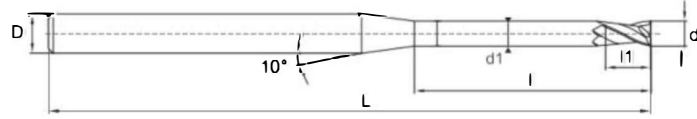
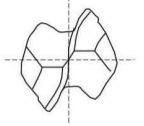
**55 HRC**



ORDER NO	K. RADÜS	d	l1	d1	l	D	L	Z	FİYAT
GR558010-6	R0.1	1	1.3	0.95	6	4	50	2	\$20,00
GR558010-8	R0.1	1	1.3	0.95	8	4	50	2	\$20,00
GR558010-10	R0.1	1	1.3	0.95	10	4	50	2	\$20,00
GR558010-12	R0.1	1	1.3	0.95	12	4	50	2	\$20,00
GR558015-8	R0.1	1,5	1.8	1.45	8	4	50	2	\$20,00
GR558015-10	R0.1	1,5	1.8	1.45	10	4	50	2	\$20,00
<b>GR558015-12</b>	R0.1	1,5	1.8	1.45	12	4	50	2	\$20,00
GR558015-15	R0.1	1,5	1.8	1.45	15	4	50	2	\$20,00
GR558020-6	R 0.2	2	2.3	1.95	6	3	50	2	\$20,00
GR558020-8	R0.2	2	2.3	1.95	8	4	50	2	\$20,00
GR558020-12	R0.2	2	2.3	1.95	12	4	50	2	\$20,00
GR558020-16	R0.2	2	2.3	1.95	16	4	50	2	\$20,00
GR558020-20	R0.2	2	2.3	1.95	20	4	50	2	\$20,00
GR558030-11	R0.2	3	3.2	2.90	11	4	50	2	\$20,00
<b>GR558030-16</b>	R0.2	3	3.2	2.90	16	4	5	2	\$20,00
GR558030-19	R0.2	3	3.2	2.90	19	4	50	2	\$20,00
GR558030-24	R0.2	3	3.2	2.90	24	4	50	2	\$20,00

## LONG NECKS CARBIDE END MILL

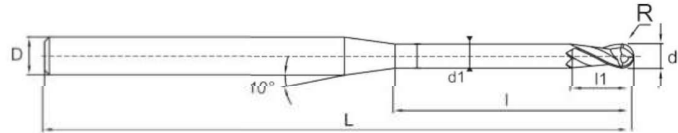
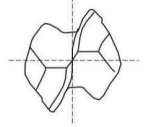
**55 HRC**



ORDER NO	d	l1	d1	l	D	L	Z	FİYAT
GR55F005-4	0,5	0,75	0.70	4	4	50	2	\$19,20
GR55F010-6	1	1,3	0.95	6	4	50	2	\$19,20
GR55F010-8	1	1,3	0.95	8	4	50	2	\$19,20
GR55F010-1	1	1,3	0.95	10	4	50	2	\$19,20
GR55F015-8	1,5	1,8	1.45	8	4	50	2	\$19,20
GR55F015-10	1,5	1,8	1.45	10	4	50	2	\$19,20
GR55F015-12	1,5	1,8	1.45	12	4	50	2	\$19,20
GR55F015-16	1,5	2,5	1.45	16	4	50	2	\$19,20
GR55F020-20	2	3	1.95	20	4	50	2	\$19,20

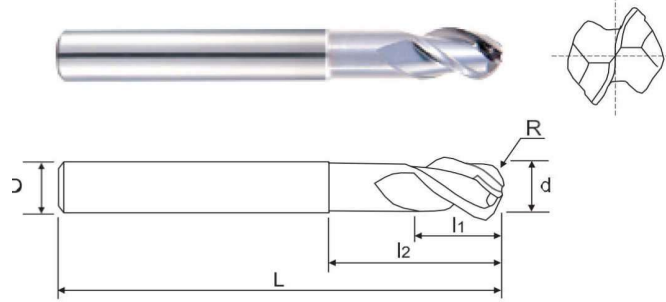
## LONG NECKS BALL NOSE CARBIDE END MILL

**55 HRC**



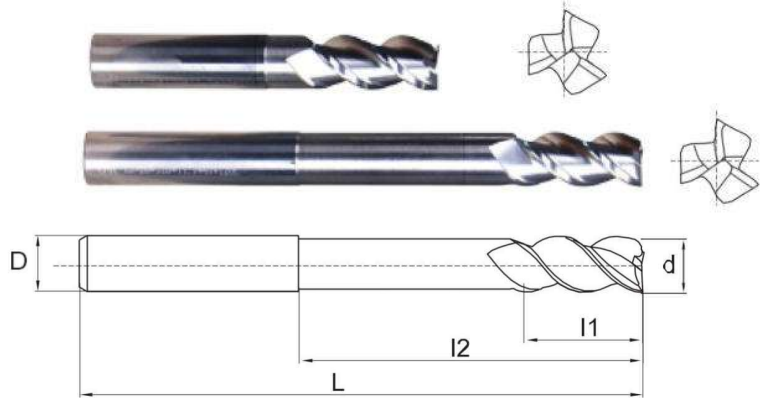
ORDER NO	RADÜS	d	l1	d1	l	D	L	Z	FİYAT
GR55B006-	R0.3	0.6	1	0.55	2	4	50	2	\$22,20
GR55B010-6	R0.5	1.0	1,2	0.95	6	4	50	2	\$20,00
GR55B010-8	R0.5	1.0	1,2	0.95	8	4	50	2	\$20,00
GR55B010-10	R0.5	1.0	1,2	0.95	10	4	50	2	\$20,00
GR55B010-12	R0.5	1.0	1,2	0.95	12	4	50	2	\$20,00
GR55B015-8	R0.75	1.5	1,5	1.45	8	4	50	2	\$20,00
GR55B015-10	R0.75	1.5	1,5	1.45	10	4	50	2	\$20,00
GR55B015-12	R0.75	1.5	1,5	1.45	12	4	50	2	\$20,00
GR55B015-16	R0.75	1.5	1,5	1.45	16	4	50	2	\$20,00
GR55B020-8	R1.0	2	2,3	1.95	8	4	50	2	\$20,00
GR55B020-12	R1.0	2	2,3	1.95	12	4	50	2	\$20,00
GR55B020- 6	R1.0	2	2,3	1.95	16	4	50	2	\$20,00
GR55B020-20	R1.0	2	2,3	1.95	20	4	50	2	\$20,00

## ALUMINUM CARBIDE BALL NOSE END MILL



ORDER NO	RADÜS	d	D	l1	L	l2	Z	FİYAT
GR55AL010	R0.5	1	6	2	60	15	2	\$24,80
GR55AL020B	R1.0	2	6	4	60	20	2	\$24,80
GR55AL030	R1.5	3	6	6	70	25	2	\$25,80
GR55AL040B	R2.0	4	6	8	70	25	2	\$25,80
GR55AL050B	R2.5	5	6	10	70	25	2	\$29,80
GR55AL060B	R3.0	6	6	12	80	35	2	\$31,20
GR55AL080B	R4.0	8	8	16	80	35	2	\$43,50
GR55AL100B	R5.0	10	10	20	90	45	2	\$64,80
GR55AL120B	R6.0	12	12	24	100	50	2	\$84,30

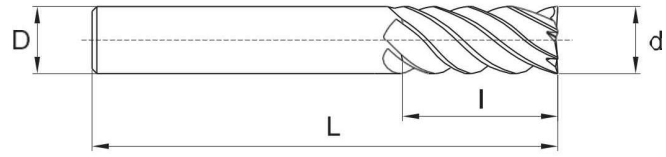
## ALUMINUM CARBIDE END MILL



ORDER NO	d	D	l1	L	l2	K.RADÜS	Z	FİYAT
GR55AL030	3	6	8	57	12	0,1	3	\$23,80
GR55AL040	4	6	11	57	18	0,1	3	\$23,80
GR55AL050	5	6	13	57	18	0,1	3	\$23,80
GR55AL060	6	6	13	57	18	0,2	3	\$23,80
GR55AL060-1	6	6	13	80	42	0,2	3	\$28,10
GR55AL080	8	8	2	63	25	0,2	3	\$32,60
GR55AL080-1	8	8	21	100	62	0,2	3	\$42,10
GR55AL100	10	10	22	72	30	0,2	3	\$43,20
GR55AL100-1	10	10	22	100	58	0,2	3	\$60,90
GR55AL120	12	12	26	75	36	0,2	3	\$69,20
GR55AL120-1	12	12	26	120	73	0,2	3	\$89,10

## CARBIDE 6 FLUTE END MILL

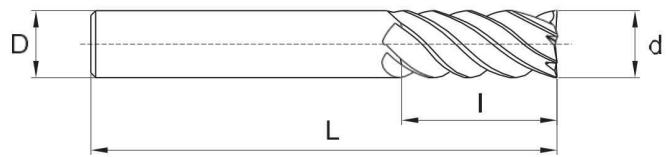
**65 HRC**



ORDER NO	d	l	D	L	Z	FİYAT
RF55060	6	15	6	50	6	\$37,5
RF55080	8	20	8	60	6	\$52,80
RF55100	10	25	10	75	6	\$79,50
RF55120	12	30	12	75	6	\$104,50
GRF55160	16	45	16	10		\$229,50

## LONG CARBIDE 6 FLUTE END MILL

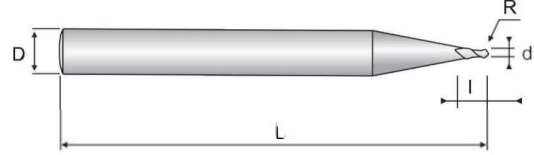
**65 HRC**



ORDER NO	d	l	D	L	Z	FİYAT
GRF65060	6	30	6	100	6	\$ 69,10
GRF65080	8	40	8	100	6	\$81,20
GRF65100	10	45	10	100	6	\$96,50
GRF65120	12	45	12	100	6	\$134,70
GRF65160	16	65	16	150	6	\$274,40

## SHORT BALL NOSE CARBIDE END MILL SHANK Ø6

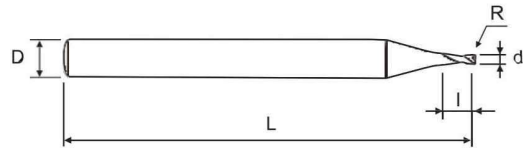
**55 HRC**



ORDER NO	RADÜS	d	l	D	L	Z	FİYAT
GR6508012	R0.40	0.80	1,2	6	50	2	\$32,40
GR6501012	R0.50	1	1,2	6	50	2	\$31,30
GR650121	R0.60	1,2	1,2	6	50	2	\$31,30
GR6501515	R0.75	1,5	1,5	6	50	2	\$31,30
GR6502020	R1.0	2	2	6	50	2	\$31,30
GR6501020	R0.50	1	2	6	50	2	\$31,30
GR6501530	R0.75	1,5	3	6	50	2	\$31,30
GR6502040	R1.0	2	4	6	50	2	\$31,30
GR6503060	R1.50	3	6	6	50	2	\$31,30
GR6504080	R2.0	4	8	6	50	2	\$31,30

## CORNER RADIUS CARBIDE END MILL SHANK Ø6

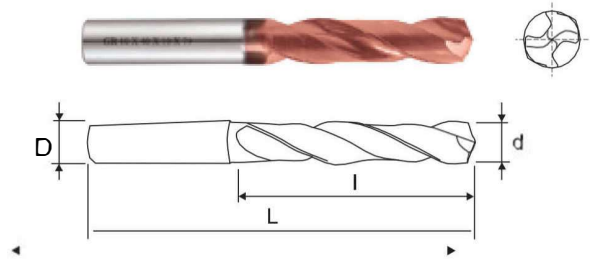
**55 HRC**



ORDER NO	RADÜS	d	l	D	L	Z	FİYAT
GR651010	R0.2	1	2	6	50	2	\$31,30
GR651015	R0.2	1,5	3	6	50	2	\$31,30
GR651020	R0.2	2	3	6	50	2	\$31,30

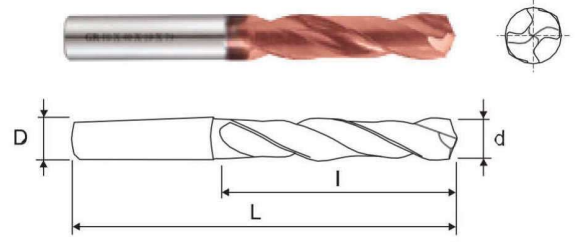
# CARBIDE DRILL DIN6539

## 3XD



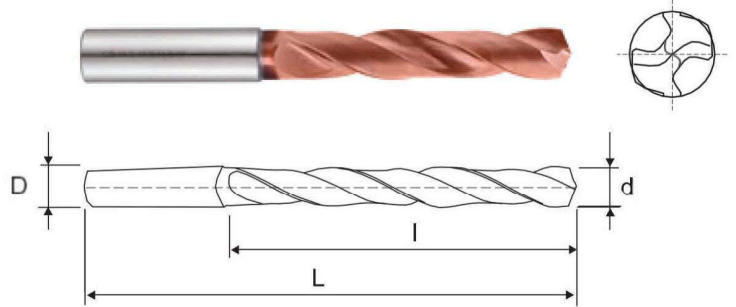
ORDER NO	d	I	D	L	FİYAT
GR-D55301	1.0	5	3	50	\$17,70
GR-D553015	1,5	7	3	50	\$17,70
GR-D553020	2.0	10	4	52	\$17,7
GR-D553025	2.5	12	4	52	\$17,70
GR-D55303	3,0	20	3	53	\$17,70
GR-D55303	3,2	20	3	53	\$18,50
GR-D55303	3,5	20	3	53	\$18,50
GR-D55304	4,0	21	4	53	\$18,50
GR-D55304	4,2	23	5	53	\$19,50
GR-D5	4,5	23	5		\$25,20
GR-D55305	5,0	27	5	64	\$25,20
GR-D553052	5,2	27	6	64	\$28,30
GR-D553055	5,5	27	6	64	\$28,30
GR-D553060	6,0	28	6	64	\$28,30
GR-D553062	6,2	34	7	72	\$37,20
GR-D553065	6,5	34	7	72	\$37,20
GR-D553067	6,7	34	7	72	\$37,20
GR-D553068	6,8	34	7	72	\$37,20
GR-D55307	7,0	34	7	72	\$37,20
GR-D553075	7,5	40	8	7	\$37,20
GR-D553080	8,0	40	8	79	\$38,20
GR-D5 082	8,2	40	10	79	\$54,20
GR-D553085	8,5	40	10	79	\$54,20
GR-D553090	9,0	40	10	79	\$54,20
GR-D553095	9,5	40	10	79	\$62,40
GR-D553100	10,0	40	10	79	\$62,40
GR-D553102	10,2	60	12	100	\$83,70
GR-D553105	10,5	60	12	100	\$83,70
GR-D553108	10,8	60	12	100	\$83,70
GR-D55311	11,0	60	12	100	\$85,30

## CARBİDE DRİLL DIN6539 3XD



ORDER NO	d	l	D	L	FİYAT
GR-D553115	11,5	60	12	100	\$85,30
GR-D553120	12,0	60	12	100	\$85,30
GR-D553125	12,5	60	14	100	\$109,50
GR-D553130	13,0	60	14	100	\$109,50
GR-D553135	13,5	60	14	100	\$109,50
GR-D55314	14,0	60	14	100	\$109,50

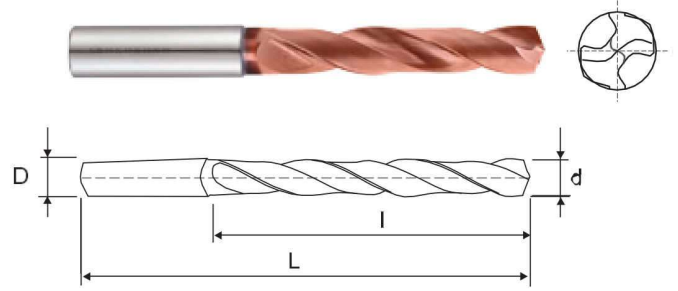
## CARBİDE DRİLL DIN6537 3XD



ORDER NO	d	l	D	L	FİYAT
GR-D5530	1.0	5	3	50	\$45,70
GR-D55301	1,5	7	3	50	\$45,70
GR-D5530	2.0	10	4	52	\$45,70
GR-D55302	2,5	12	4	52	\$45,70
GR-D553030	3,0	20	6	62	\$45,70
GR-D5530	3,2	20	6	62	\$45,70
GR-D55303	3,5	20	6	62	\$45,70
GR-D553040	4,0	24	6	66	\$45,70
GR-D553042	4,2	24	6	66	\$45,70
GR-D5530	4,5	24	6	66	\$45,70
GR-D553050	5,0	28	6	66	\$45,70
GR-D553052	5,2	28	6	66	\$45,70
GR-D5530	5,5	28	6	66	\$45,70

# CARBIDE DRILL DIN6537

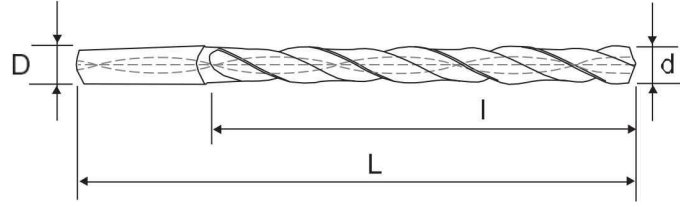
## 3XD



ORDER NO	d	l	D	L	FİYAT
GR-D553060	6,0	28	6	66	\$45,70
GR-D553062	6,2	34	8	79	\$64,10
GR-D553065	6,5	34	8	79	\$64,10
GR-D553067	6,7	34	8	79	\$64,10
GR-D553068	6,8	34	8	79	\$64,10
GR-D553070	7,0	34	8	79	\$64,10
GR-D553075	7,5	41	8	89	\$64,10
GR-D553080	8,0	41	8	89	\$64,10
GR-D553082	8,2	41	10	89	\$71,80
GR-D553085	8,5	47	10	89	\$71,80
GR-D553090	9,0	47	10	89	\$71,80
GR-D553095	9,5	47	10	89	\$71,80
GR-D553100	10,0	47	10	89	\$71,80
GR-D553102	10,2	55	12	102	\$104,20
GR-D553105	10,5	55	12	102	\$104,20
GR-D553108	10,8	55	12	102	\$104,20
GR-D553110	11,0	55	12	102	\$104,20
GR-D553115	11,5	55	12	102	\$104,20
GR-D553120	12,0	55	12	102	\$104,20
GR-D553125	12,5	60	14	107	\$123,50
GR-D553130	13,0	60	14	107	\$123,50
GR-D553135	13,5	60	14	107	\$123,50
GR-D553140	14,0	60	14	107	\$123,50

# LONG CARBIDE DRILL INTERNAL COOLANT

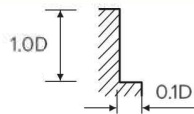
## 8XD



ORDER NO	d	I	D	L	FİYAT
GR-D558030	3,0	34	6	7	\$85,20
GR-D558032	3,2	34	6	72	\$85,20
GR-D558035	3,5	34	6	72	\$85,20
GR-D558040	4,0	43	6	81	\$85,20
GR-D558042	4,2	43	6	81	\$85,20
GR-D558045	4,5	43	6	81	\$85,20
GR-D558050	5,0	57	6	95	\$85,20
GR-D558052	5,2	57	6	95	\$85,20
GR-D558055	5,5	57	6	95	\$85,20
GR-D558060	6,0	57	6	95	\$85,20
GR-D558062	6,2	76	8	114	\$134,50
GR-D558065	6,5	76	8	11	\$134,50
GR-D558067	6,7	76	8	114	\$134,5
GR-D558068	6,8	76	8	114	\$134,50
GR-D558070	7,0	76	8	114	\$134,50
GR-D558075	7,5	76	8	114	\$134,50
GR-D558080	8,0	76	8	114	\$134,50
GR-D558082	8,2	95	10	142	\$236,00
GR-D558085	8,5	95	10	142	\$236,00
GR-D558090	9,0	95	10	142	\$236,00
GR-D558095	9,5	95	10	142	\$236,00
GR-D558100	10,0	95	10	142	\$236,00
GR-D558102	10,2	114	12	162	\$370,00
GR-D558105	10,5	114	12	162	\$370,00
GR-D558108	10,8	114	12	162	\$370,00
GR-D558110	11,0	114	12	162	\$370,00
GR-D558115	11,5	114	12	162	\$370,00
GR-D558120	12,0	114	12	162	\$370,00
GR-D558125	12,5	133	14	178	\$370,00
GR-D558130	13,0	133	14	178	\$370,00
GR-D558135	13,5	133	14	178	\$370,00
GR-D558140	14,0	133	14	178	\$370,00

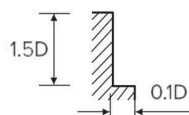
**GR450, GR451, GR452, GR453, GR456  
GR550, GR551, GR552, GR553, GR556,**

MATERIAL	ALLOY STEEL LOW ALLOY STEELS TOOL STEELS				ALLOY STEEL HEAT-RESISTANT STEELS				STAINLESS STEELS			
	DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc
1.0	18600	60	55	0.002	0350	5	30	0.002	8750	5	25	0.002
1.0	18600	60	55	0.002	0350	5	30	0.002	8750	85	25	0.002
1.5	12200	25	55	0.005	7150	20	35	0.004	7150	130	35	0.004
2.0	9950	50	60	0.006	550	50	40	0.006	5450	130	35	0.006
3.0	7850	90	70	0.009	4850	80	45	0.009	4050	55	35	0.009
4.0	6650	100	80	0.019	4150	10	50	0.019	3450	50	40	0.018
5.0	5550	120	85	0.024	3350	320	50	0.024	2850	60	40	0.024
6.0	4950	180	90	0.029	950	360	55	0.031	2500	90	45	0.029
8.0	3650	620	90	0.043	250	330	55	0.038	1950	310	45	0.042
10.0	2850	30	85	0.047	850	60	55	0.038	1500	60	45	0.044
12.0	2450	50	90	0.047	550	25	55	0.037	1250	210	45	0.045
14.0	2250	410	90	0.047	1400	210	55	0.038	1100	95	45	0.045
16.0	1900	360	95	0.047	200	80	60	0.037	1000	80	50	0.045
0.0	1550	80	90	0.047	50	145	55	0.038	750	140	45	0.046



**GR450, GR451, GR452, GR453, GR456  
GR550, GR551, GR552, GR553, GR556,**

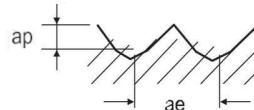
MATERIAL	CAST IRON				ALUMINUM ALLOYS				COPPER, BRASS NON-FERROUS METALS			
	DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc
1.0	8800	630	60	0.008	44500	1100	140	0.006	24800	610	80	0.006
1.5	2150	630	55	0.013	8000	180	130	0.011	0400	920	95	0.011
2.0	9450	650	60	0.017	2500	350	140	0.015	6600	1040	105	0.016
3.0	6100	650	55	0.026	5500	350	145	0.021	11100	1040	105	0.024
4.0	4750	650	60	0.035	11100	350	140	0.030	8900	1040	110	0.029
5.0	3700	650	55	0.044	9200	350	145	0.036	900	1040	105	0.038
6.0	3050	775	55	0.065	7700	440	145	0.047	800	1120	105	0.048
8.0	250	825	55	0.093	800	1440	145	0.063	500	1120	110	0.063
10.0	950	875	60	0.116	4700	440	145	0.078	3500	1120	105	0.081
12.0	550	920	55	0.155	3800	1440	140	0.095	900	1120	105	0.096
14.0	350	950	55	0.182	3400	440	145	0.108	500	1120	105	0.115
16.0	150	980	55	0.220	900	1440	145	0.125	300	1120	110	0.125
0.0	50	1040	55	0.288	250	1440	140	0.163	1750	1120	105	0.162



## GR405, GR415, GR425, GR505, GR515, GR525, GR535, GR545, GR555,

MATERIAL	ALLOY STEEL LOW ALLOY STEELS TOOL STEELS				ALLOY STEEL HEAT-RESISTANT STEELS				STAINLESS STEELS			
	DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc	fz	RPM	FEED	Vc
R1.0 x 2.0	12400	660	80	0.026	9170	420	55	0.023	4020	30	25	0.016
R1.5 x 3.0	1450	585	105	0.025	8560	395	80	0.023	3820	30	35	0.016
R2.0 x 4.0	8980	645	110	0.035	7160	460	90	0.031	3650	60	45	0.021
R2.5 x 5.0	7850	710	125	0.045	6220	510	95	0.040	3140	60	50	0.024
R3.0 x 6.0	7300	880	135	0.060	5910	720	110	0.060	2730	170	50	0.030
R4.0 x 8.0	6150	1100	155	0.089	4920	795	125	0.080	080	95	50	0.046
R5.0 x 10.0	550	1340	170	0.122	436	880	135	0.100	780	95	55	0.054
R6.0 x 12.0	5050	1520	190	0.150	3960	960	150	0.120	530	20	55	0.070
R7.0 x 14.0	4580	1510	200	0.165	3620	935	160	0.128	350	20	55	0.081
R8.0 x 16.0	4110	80	205	0.180	3220	920	160	0.141	1150	20	60	0.091
R9.0 x 18.0	850	1440	215	0.188	3020	895	170	0.148	080	20	60	0.100
R10.0 x 20.0	600	1440	225	0.201	2820	895	175	0.158	980	20	60	0.111

ap : D1-D6=0.25mm  
D8-D20=0.30mm  
ae : 0.25D



## GR405, GR415, GR425, GR505, GR515, GR525, GR535, GR545, GR555,

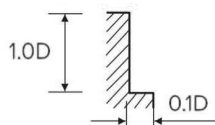
MATERIAL	CAST IRON				ALUMINUM ALLOYS			
	DIAMETER	RPM	FEED	Vc	fz	RPM	FEED	Vc
R1.0 x 2.0	10550	30	65	0.010	0900	400	195	0.006
R1.5 x 3.0	7100	240	65	0.016	0550	400	195	0.010
R2.0 x 4.0	5180	95	65	0.028	5450	400	195	0.013
R2.5 x 5.0	4200	35	65	0.040	250	180	190	0.019
R3.0 x 6.0	3450	370	65	0.053	0350	480	195	0.023
R4.0 x 8.0	2550	480	65	0.092	7950	550	200	0.034
5.0 x 10.0	2080	480	65	0.112	200	550	195	0.044
R6.0 x 12.0	1790	480	65	0.131	200	640	195	0.061
R7.0 x 14.0	1440	480	60	0.164	4350	640	190	0.073
R8.0 x 16.0	350	480	65	0.177	900	550	195	0.070
R9.0 8.0	1150	480	60	0.209	450	550	190	0.079
R10.0 x 20.0	100	430	65	0.200	980	550	185	0.092



\* Cutting Speed Subjected to the above 20% variation

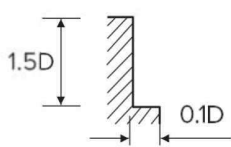
## GR558, GR559,

MATERIAL	ALLOY STEEL LOW ALLOY STEELS TOOL STEELS				ALLOY STEEL HEAT-RESISTANT STEELS				STAINLESS STEELS			
	DIAMETER	RPM	FEED $f$	$v_c$	$f_z$	RPM	FEED $f$	$v_c$	$f_z$	RPM	FEED $f$	$v_c$
1.0	17700	160	55	0.002	10300	90	30	0.002	8680	80	25	0.002
1.5	11850	220	55	0.005	7080	120	35	0.004	7080	130	35	0.004
2.0	9900	250	60	0.006	6480	150	40	0.006	5380	130	35	0.006
3.0	7650	280	70	0.009	4780	180	45	0.009	4000	150	35	0.009
4.0	6500	490	80	0.019	4000	310	50	0.019	3320	250	40	0.018
5.0	5400	520	85	0.024	3250	310	50	0.024	2730	260	40	0.024
6.0	4800	570	90	0.029	2880	360	55	0.031	2430	290	45	0.029
8.0	3600	610	90	0.043	2180	330	55	0.038	1850	310	45	0.042
10.0	2800	530	85	0.047	1750	260	55	0.038	1480	260	45	0.044
12.0	2400	450	90	0.047	1480	220	55	0.037	1180	210	45	0.045
14.0	2150	400	90	0.047	1350	230	60	0.037	1100	200	45	0.045



## GR558, GR559,

MATERIAL	CAST IRON				ALUMINUM ALLOYS				COPPER, BRASS NON-FERROUS METALS			
	DIAMETER	RPM	FEED $f$	$v_c$	$f_z$	RPM	FEED $f$	$v_c$	$f_z$	RPM	FEED $f$	$v_c$
1.0	18800	630	60	0.008	44500	1100	140	0.006	24900	610	80	0.006
1.5	12150	630	55	0.013	28000	1180	130	0.011	20500	920	95	0.011
2.0	9380	650	60	0.017	22500	1350	140	0.015	16800	1050	105	0.016
3.0	6080	650	55	0.026	15500	1350	145	0.021	11500	1050	105	0.024
4.0	4650	650	60	0.035	11500	1350	140	0.030	8900	1050	110	0.029
5.0	3680	650	55	0.044	9500	1350	145	0.036	6900	1050	105	0.038
6.0	2980	780	55	0.065	7800	1450	145	0.047	5800	1150	105	0.048
8.0	2240	820	55	0.093	5800	1450	145	0.063	4500	1150	110	0.063
10.0	1880	870	60	0.116	4700	1450	145	0.078	3500	1150	105	0.081
12.0	1480	910	55	0.155	3800	1450	140	0.095	2900	1150	105	0.096
14.0	1280	880	55	0.155	3400	1400	140	0.095	2950	1050	105	0.096



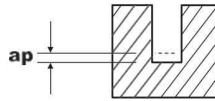
\* These are approximate values for reference only.

## GR55F,

MATERIAL	NON-FERROUS METALS HEAT RESISTANT STEELS				
MATERIAL	RPM	$f$ (RPM)	$a_p$ (mm)	$V_c$	$f_z$
0.5	7000~35000	80~380	0.009~0.022	42~53	0.003~0.005
1.0	19500~24500	50~700	0.045~0.090	60~75	0.006~0.014
1.5	13000~16000	50~780	0.070~0.135	59~73	0.010~0.025
2.0	0100~13000	50~780	0.090~0.180	63~79	0.012~0.031

## GR55F,

MATERIAL	ALLOY STEEL HEAT RESISTANT STEELS				
MATERIAL	RPM	$f$ (RPM)	$a_p$ (mm)	$V_c$	$f_z$
0.5	19500~24500	80~300	0.009~0.022	30~38	0.002~0.006
1.0	14000~17500	170~520	0.045~0.090	42~53	0.006~0.015
1.5	9000~12000	170~520	0.070~0.135	42~54	0.009~0.022
2.0	7500~9000	170~520	0.090~0.180	44~56	0.011~0.028



## GR55B,

MATERIAL	ALLOY STEEL HEAT RESISTANT STEELS				
DIAMETER	RPM	$f$ (RPM)	$a_p$ (mm)	$V_c$	$f_z$
R0.3 x 0.6	6500~34500	90~550	0.027~0.054	50~64	0.004~0.008
R0.5 x 1.0	24800~31500	20~600	0.045~0.090	77~97	0.004~0.010
R0.75 x 1.5	6500~21000	20~680	0.070~0.135	75~97	0.007~0.016
R1.0 x 2.0	3500~16500	20~680	0.090~0.180	82~101	0.008~0.021

## GR55B,

MATERIAL	ALLOY STEEL HEAT RESISTANT STEELS				
DIAMETER	RPM	$f$ (RPM)	$a_p$ (mm)	$V_c$	$f_z$
R0.3 x 0.6	19500~24500	5~320	0.027~0.054	36~46	0.002~0.006
R0.5 x 1.0	17800~22500	20~340	0.045~0.090	55~69	0.003~0.007
R0.75 x 1.5	11800~15100	20~340	0.070~0.135	54~70	0.005~0.011
R1.0 x 2.0	9800~11800	20~340	0.090~0.180	59~72	0.006~0.014

