



Helical

MANUFACTURERS OF HIGH PERFORMANCE
CARBIDE CUTTING TOOLS

Expanded Series ***HSV-4 & HSV-RN-4***

See inside for all standard size/length combinations available

Alloy Steel • Stainless Steel • Cast Iron • High-Temp Alloys • Titanium

4-Flute "Variable Pitch" Construction

Extensive Corner Radius & Ball Nose Selections Now Available!

Free Cutting with Increased Edge Strength & Reduced Chatter

Used in Both Roughing & Finishing Applications

Aplus Coating Providing Optimum Performance & Superior Tool Life

Shank Flats Available Upon Request

Special Configurations Quoted Upon Request

Reduced Neck for Longer Reach and Maximum Strength



Helical

Manufacturers of High Performance
Carbide Cutting Tools

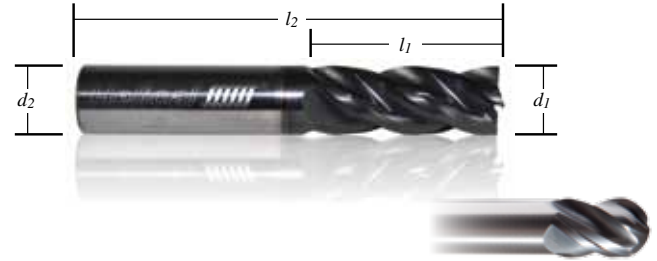
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Distributed By:

HSV-4



- Strong eccentrically relieved tool grind for the toughest of applications
- Combines two tools into one, for roughing & finishing
- Variable pitch design helps to eliminate chatter
- Multiple corner radius options allowing for stronger tool corners, increased tool life and part finish
- Excellent results in all ferrous materials and Titanium



New Corner Radii and Full Ball Nose Selections now available!

Ball Nose Configuration
(Listed Below)

HSV-4 (Aplus Coated)							STEEL			STAINLESS STEEL		CAST IRON		HI-TEMP ALLOYS	
(d _c) Cutting Dia.	(d _s) Shank Dia.	(L) LOC	(L) OAL	No. of Flutes	Sq. End	Corner Radius							Ball Nose	Tool Description	
						.010	.020	.030	.060	.090	.125	.190	.250		
1/8	1/8	1/4	1-1/2	4	30017	31017		43017						56017	HSV-S-40125
	1/8	1/2	2-1/2	4	30032	31032		43032						56032	HSV-R-40125
5/32	3/16	3/16	2	4	30047	31047									HSV-S-40156
	3/16	7/16	2-1/2	4	30062	31062									HSV-R-40156
3/16	3/16	5/16	2	4	30077	31077		43077						56077	HSV-S-40187
	3/16	5/8	2-1/2	4	30092	31092		43092						56092	HSV-R-40187
7/32	1/4	1/4	2	4	30107	31107									HSV-S-40218
	1/4	7/16	2-1/2	4	30122	31122									HSV-R-40218
1/4	1/4	3/8	2	4	30137		31137	43137	43138					56137	HSV-S-40250
	1/4	1/2	2-1/2	4	30142		31142	43142	43143					56142	HSV-SR-40250
	1/4	3/4	2-1/2	4	30152		31152	43152	43153					56152	HSV-R-40250
	1/4	1	3	4	30167		31167	43167	43168					56167	HSV-M-40250
9/32	5/16	7/16	2	4	30182		31182								HSV-S-40281
	5/16	5/8	2-1/2	4	30197		31197								HSV-R-40281
	5/16	1	3	4	30212		31212								HSV-M-40281
5/16	5/16	1/2	2	4	30227		31227	43227	43228					56227	HSV-S-40312
	5/16	3/4	2-1/2	4	30242		31242	43242	43243					56242	HSV-R-40312
	5/16	1-1/4	3	4	30257		31257	43257	43258					56257	HSV-M-40312
11/32	3/8	1/2	2	4	30272		31272								HSV-S-40343
	3/8	13/16	3	4	30287		31287								HSV-R-40343
3/8	3/8	1/2	2	4	30317		31317	43317	43318	43319				56317	HSV-S-40375
	3/8	7/8	3	4	30332		31332	43332	43333	43334				56332	HSV-SR-40375
	3/8	1	3	4	30337		31337	43337	43338	43339				56337	HSV-R-40375
	3/8	1-1/4	3	4	30347		31347	43347	43348	43349				56347	HSV-M-40375
13/32	7/16	1/2	2-3/4	4	30362		31362								HSV-S-40406
	7/16	15/16	2-3/4	4	30377		31377								HSV-R-40406
7/16	7/16	5/8	2-3/4	4	30407		31407	43407	43408	43409				56407	HSV-S-40437
	7/16	7/8	2-3/4	4	30422		31422	43422	43423	43424				56422	HSV-R-40437
	7/16	1-1/8	3-1/2	4	30437		31437	43437	43438	43439				56437	HSV-M-40437
15/32	1/2	5/8	2-1/2	4	30452			31452							HSV-S-40468
	1/2	1	3	4	30467			31467							HSV-R-40468
	1/2	1-1/4	3	4	30482			31482							HSV-M-40468
1/2	1/2	5/8	2-1/2	4	30497		43496	31497	43497	43498	43499			56497	HSV-S-40500
	1/2	1	3	4	30512		43511	31512	43512	43513	43514			56512	HSV-SR-40500
	1/2	1-1/4	3	4	30527		43526	31527	43527	43528	43529			56527	HSV-R-40500
	1/2	1-5/8	4	4	30542		43541	31542	43542	43543	43544			56542	HSV-M-40500
5/8	5/8	3/4	3	4	30557			31557	43557	43558	43559			56557	HSV-S-40625
	5/8	1-1/4	3-1/2	4	30572			31572	43572	43573	43574			56572	HSV-SR-40625
	5/8	1-5/8	3-1/2	4	30587			31587	43587	43588	43589			56587	HSV-R-40625
	5/8	2	4	4	30602			31602	43602	43603	43604			56602	HSV-M-40625
	5/8	3-1/4	6	4	30617			31617	43617	43618	43619			56617	HSV-L-40625
3/4	3/4	7/8	3	4	30632			31632	43632	43633	43634	43635	43636	56632	HSV-S-40750
	3/4	1-1/4	4	4	30647			31647	43647	43648	43649	43650	43651	56647	HSV-SR-40750
	3/4	1-5/8	4	4	30662			31662	43662	43663	43664	43665	43666	56662	HSV-R-40750
	3/4	2-1/4	5	4	30677			31677	43677	43678	43679	43680	43681	56677	HSV-M-40750
	3/4	3-1/4	6	4	30692			31692	43692	43693	43694	43695	43696	56692	HSV-L-40750
1	1	1-1/2	4	4	30707			31707	43707	43708	43709	43710	43711	56707	HSV-S-41000
	1	2	4-1/2	4	30722			31722	43722	43723	43724	43725	43726	56722	HSV-R-41000
	1	2-5/8	5	4	30737			31737	43737	43738	43739	43740	43741	56737	HSV-M-41000
	1	3	6	4	30742			31742	43742	43743	43744	43745	43746	56742	HSV-ML-41000
	1	4-1/4	7	4	30752			31752	43752	43753	43754	43755	43756	56752	HSV-L-41000

APPROPRIATE MACHINING OPERATIONS FOR HSV-4



TOOL TOLERANCES

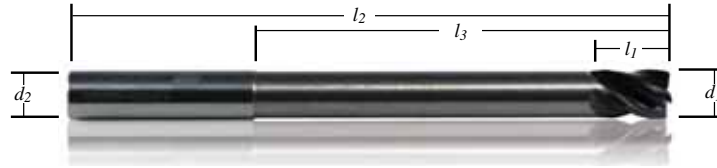
Cutting Diameter: +.000 / -.002
Shank Diameter: -.0001 / -.0004 (ISO h6)
Corner Radius: +/- .002
Ball Nose Radius: +/- .001

Runout (T.I.R.): .0005 max.
Overall Length: +/- 1/16"
Length of Cut: +.032 / -.000

HSV-RN-4



Reduced neck provides a much stronger option for long reach/deep pocketing applications



Ball Nose Configuration
(Listed Below)

New Corner Radii and Full Ball Nose Selections now available!

HSV-RN-4 (Aplus Coated)										STEEL		STAINLESS STEEL		CAST IRON		HI-TEMP ALLOYS	
(d _c) Cutting Dia.	(d _s) Shank Dia.	(l _c) LOC	(l _s) OAL	(l _s) LBS	Neck Dia.	No. of Flutes	Sq. End	Corner Radius								Ball Nose	Tool Description
								.010	.020	.030	.060	.090	.125	.190	.250		
1/8	1/8	5/32	3	3/8	.118	4	52017	32017		53017						57017	HSV-RN-S-40125
	1/8	5/32	3	1/2	.118	4	52032	32032		53032						57032	HSV-RN-R-40125
	1/8	5/32	3	5/8	.118	4	52047	32047		53047						57047	HSV-RN-M-40125
3/16	3/16	7/32	3	1/2	.178	4	52062	32062		53062						57062	HSV-RN-R-40187
	3/16	7/32	3	3/4	.178	4	52077	32077		53077						57077	HSV-RN-M-40187
	3/16	7/32	3	1	.178	4	52092	32092		53092						57092	HSV-RN-L-40187
1/4	1/4	3/8	3	3/4	.237	4	52107		32107	53107	53108					57107	HSV-RN-S-40250
	1/4	3/8	4	1-1/8	.237	4	52122		32122	53122	53123					57122	HSV-RN-R-40250
	1/4	3/8	4	2-1/8	.237	4	52137		32137	53137	53138					57137	HSV-RN-M-40250
3/8	3/8	1/2	4	1-1/8	.356	4	52152		32152	53152	53153	53154				57152	HSV-RN-S-40375
	3/8	1/2	4	2-1/8	.356	4	52167		32167	53167	53168	53169				57167	HSV-RN-R-40375
	3/8	1/2	6	3-1/8	.356	4	52182		32182	53182	53183	53184				57182	HSV-RN-M-40375
	3/8	1/2	6	4-1/8	.356	4	52197		32197	53197	53198	53199				57197	HSV-RN-L-40375
1/2	1/2	5/8	4	1-1/2	.475	4	52212		53211	32212	53212	53213	53214			57212	HSV-RN-S-40500
	1/2	5/8	4	2-1/4	.475	4	52227		53226	32227	53227	53228	53229			57227	HSV-RN-R-40500
	1/2	5/8	6	3-3/8	.475	4	52242		53241	32242	53242	53243	53244			57242	HSV-RN-M-40500
	1/2	5/8	6	4-1/8	.475	4	52257		53256	32257	53257	53258	53259			57257	HSV-RN-L-40500
5/8	5/8	3/4	4	1-5/8	.593	4	52272			32272	53272	53273	53274			53272	HSV-RN-S-40625
	5/8	3/4	6	2-3/8	.593	4	52287			32287	53287	53288	53289			57287	HSV-RN-R-40625
	5/8	3/4	6	3-3/8	.593	4	52302			32302	53302	53303	53304			57302	HSV-RN-M-40625
	5/8	3/4	6	4-1/8	.593	4	52317			32317	53317	53318	53319			57317	HSV-RN-L-40625
3/4	3/4	1	4	2	.712	4	52332			32332	53332	53333	53334	53335	53336	57332	HSV-RN-S-40750
	3/4	1	6	2-1/2	.712	4	52347			32347	53347	53348	53349	53350	53351	57347	HSV-RN-R-40750
	3/4	1	6	3-3/8	.712	4	52362			32362	53362	53363	53364	53365	53366	57362	HSV-RN-M-40750
	3/4	1	6	4-1/8	.712	4	52377			32377	53377	53378	53379	53380	53381	57377	HSV-RN-L-40750
1	1	1-1/4	4	2-1/4	.950	4	52392			32392	53392	53393	53394	53395	53396	57392	HSV-RN-S-41000
	1	1-1/4	6	2-5/8	.950	4	52407			32407	53407	53408	53409	53410	53411	57407	HSV-RN-R-41000
	1	1-1/4	6	3-3/8	.950	4	52422			32422	53422	53423	53424	53425	53426	57422	HSV-RN-M-41000
	1	1-1/4	6	4-1/8	.950	4	52437			32437	53437	53438	53439	53440	53441	57437	HSV-RN-L-41000



APPROPRIATE MACHINING OPERATIONS FOR HSV-RN-4



TOOL TOLERANCES

Cutting Diameter: +.000 / -.002	Runout (T.I.R.): .0005 max.
Shank Diameter: -.0001 / -.0004 (ISO h6)	Overall Length: +/- 1/16"
Corner Radius: +/- .002	Length of Cut: +.032 / -.000
Ball Nose Radius: +/- .001	Length Below Shank: +.032 / -.000

HSV-4, HSV-RN-4 Speed & Feed

Feed Rate Guide: REGULAR STYLE & REDUCED NECK STYLE

Material Guide		STEEL				STAINLESS STEEL			CAST IRON		HI-TEMP ALLOYS		
		10xx 11xx 12xx 12Lxx 15xx	13xx 41xx 43xx 86xx 92xx 93xx Chromoly	A2 H13 A3 M1 D2 O-1 H11 S-7 NAK 55	P20 P21 S-136 PX5 NAK 80	410 430F 416 440C 420	303 320 304 304L 316 316L 321 347 Kovar Invar 36	13-8 15-5 17-4 Carpenter Custom 465 Invar	Grey GG-10 GG-15 GG-20/25 GG-30/35 GG-40	Ductile (Nodular) Malleable GGG-40 GGG-50 GGG-60 GGG-70	Inconel 718 Inconel 600 Rene 100 Rene 41 A286 Haynes Waspalloy H-188 Hastalloy Hast-X Mar-M Stellite AirResist Monel	Ti61AL4V (grades 5-38)	
Surface Feet per Minute (SFM)													
SFM		low - high	low - high	low - high	low - high	low - high	low - high	low - high	low - high	low - high	low - high	low - high	
		< 42 Rc	320 - 480	200 - 400	200 - 300	200 - 300	200 - 300	160 - 300	130 - 250	300 - 450	200 - 320	70 - 110	160 - 220
		≥ 42 Rc	160 - 240	120 - 160	110 - 150	100 - 140	110 - 175	110 - 160	90 - 130	170 - 220	90 - 180	60 - 80	100 - 150
Feed per Tooth (FPT)													
1/8	Slot	.0006 - .0008	.0005 - .0007	.0005 - .0006	.0004 - .0006	.0005 - .0007	.0005 - .0006	.0004 - .0006	.0006 - .0008	.0005 - .0007	.0003 - .0004	.0004 - .0005	
	HR	.0007 - .0010	.0006 - .0009	.0006 - .0008	.0005 - .0007	.0006 - .0009	.0006 - .0008	.0005 - .0007	.0007 - .0010	.0006 - .0008	.0003 - .0005	.0005 - .0006	
	LR	.0009 - .0013	.0008 - .0011	.0007 - .0010	.0007 - .0009	.0008 - .0011	.0007 - .0010	.0007 - .0009	.0009 - .0013	.0008 - .0010	.0004 - .0006	.0006 - .0008	
	Finish	.0007 - .0009	.0006 - .0008	.0005 - .0007	.0005 - .0006	.0006 - .0008	.0005 - .0007	.0005 - .0006	.0007 - .0009	.0006 - .0008	.0003 - .0004	.0004 - .0006	
1/4	Slot	.0012 - .0016	.0010 - .0014	.0010 - .0013	.0009 - .0012	.0010 - .0014	.0010 - .0013	.0009 - .0012	.0012 - .0016	.0010 - .0013	.0005 - .0007	.0007 - .0010	
	HR	.0015 - .0020	.0013 - .0017	.0012 - .0016	.0011 - .0014	.0013 - .0017	.0012 - .0016	.0011 - .0014	.0015 - .0020	.0012 - .0017	.0007 - .0009	.0009 - .0013	
	LR	.0019 - .0025	.0016 - .0022	.0015 - .0020	.0013 - .0018	.0016 - .0022	.0015 - .0020	.0013 - .0018	.0019 - .0025	.0015 - .0021	.0009 - .0012	.0012 - .0016	
	Finish	.0013 - .0018	.0011 - .0015	.0010 - .0014	.0009 - .0013	.0011 - .0015	.0010 - .0014	.0009 - .0013	.0013 - .0018	.0011 - .0015	.0006 - .0008	.0008 - .0011	
3/8	Slot	.0018 - .0024	.0015 - .0021	.0014 - .0019	.0013 - .0017	.0015 - .0021	.0014 - .0019	.0013 - .0017	.0018 - .0024	.0015 - .0020	.0008 - .0011	.0011 - .0015	
	HR	.0022 - .0030	.0019 - .0026	.0018 - .0024	.0016 - .0022	.0019 - .0026	.0018 - .0024	.0016 - .0022	.0022 - .0030	.0018 - .0025	.0010 - .0014	.0014 - .0019	
	LR	.0028 - .0038	.0024 - .0032	.0022 - .0030	.0020 - .0027	.0024 - .0032	.0022 - .0030	.0020 - .0027	.0028 - .0038	.0023 - .0031	.0013 - .0017	.0018 - .0024	
	Finish	.0020 - .0027	.0017 - .0023	.0016 - .0021	.0014 - .0019	.0017 - .0023	.0016 - .0021	.0014 - .0019	.0020 - .0027	.0016 - .0022	.0009 - .0012	.0012 - .0017	
1/2	Slot	.0024 - .0032	.0020 - .0028	.0019 - .0026	.0017 - .0023	.0020 - .0028	.0019 - .0026	.0017 - .0023	.0024 - .0032	.0020 - .0027	.0011 - .0015	.0015 - .0020	
	HR	.0030 - .0040	.0026 - .0035	.0024 - .0032	.0021 - .0029	.0026 - .0035	.0024 - .0032	.0021 - .0029	.0030 - .0040	.0025 - .0033	.0014 - .0018	.0019 - .0025	
	LR	.0037 - .0050	.0032 - .0043	.0030 - .0040	.0027 - .0036	.0032 - .0043	.0030 - .0040	.0027 - .0036	.0037 - .0050	.0031 - .0042	.0017 - .0023	.0023 - .0032	
	Finish	.0026 - .0035	.0022 - .0030	.0021 - .0028	.0019 - .0025	.0022 - .0030	.0021 - .0028	.0019 - .0025	.0026 - .0035	.0022 - .0029	.0012 - .0016	.0016 - .0022	
5/8	Slot	.0030 - .0040	.0026 - .0035	.0024 - .0032	.0021 - .0029	.0026 - .0035	.0024 - .0032	.0021 - .0029	.0030 - .0040	.0025 - .0033	.0014 - .0018	.0019 - .0025	
	HR	.0037 - .0050	.0032 - .0043	.0030 - .0040	.0027 - .0036	.0032 - .0043	.0030 - .0040	.0027 - .0036	.0037 - .0050	.0031 - .0042	.0017 - .0023	.0023 - .0032	
	LR	.0046 - .0063	.0040 - .0054	.0037 - .0050	.0033 - .0045	.0040 - .0054	.0037 - .0050	.0033 - .0045	.0046 - .0063	.0039 - .0052	.0021 - .0029	.0029 - .0040	
	Finish	.0033 - .0044	.0028 - .0038	.0026 - .0035	.0023 - .0032	.0028 - .0038	.0026 - .0035	.0023 - .0032	.0033 - .0044	.0027 - .0037	.0015 - .0020	.0021 - .0028	
3/4	Slot	.0036 - .0048	.0031 - .0041	.0029 - .0039	.0026 - .0035	.0031 - .0041	.0029 - .0039	.0026 - .0035	.0036 - .0048	.0030 - .0040	.0016 - .0022	.0022 - .0030	
	HR	.0045 - .0060	.0038 - .0052	.0036 - .0048	.0032 - .0043	.0038 - .0052	.0036 - .0048	.0032 - .0043	.0045 - .0060	.0037 - .0050	.0020 - .0028	.0028 - .0038	
	LR	.0056 - .0075	.0048 - .0065	.0045 - .0060	.0040 - .0054	.0048 - .0065	.0045 - .0060	.0040 - .0054	.0056 - .0075	.0046 - .0063	.0026 - .0035	.0035 - .0047	
	Finish	.0039 - .0053	.0034 - .0046	.0031 - .0043	.0028 - .0038	.0034 - .0046	.0031 - .0043	.0028 - .0038	.0039 - .0053	.0033 - .0044	.0018 - .0024	.0025 - .0033	
1	Slot	.0048 - .0064	.0041 - .0055	.0038 - .0052	.0034 - .0046	.0041 - .0055	.0038 - .0052	.0034 - .0046	.0048 - .0064	.0039 - .0053	.0022 - .0029	.0030 - .0040	
	HR	.0060 - .0081	.0051 - .0069	.0048 - .0064	.0043 - .0058	.0051 - .0069	.0048 - .0064	.0043 - .0058	.0060 - .0081	.0049 - .0067	.0027 - .0037	.0037 - .0051	
	LR	.0074 - .0101	.0064 - .0086	.0060 - .0081	.0053 - .0072	.0064 - .0086	.0060 - .0081	.0053 - .0072	.0074 - .0101	.0062 - .0083	.0034 - .0046	.0047 - .0063	
	Finish	.0052 - .0071	.0045 - .0061	.0042 - .0057	.0037 - .0051	.0045 - .0061	.0042 - .0057	.0037 - .0051	.0052 - .0071	.0043 - .0059	.0024 - .0032	.0033 - .0045	



Depth of Cut Guide: REGULAR STYLE

		Slotting (S)	Heavy Roughing (HR)	Light Roughing (LR)	Finishing (F)
Length of Cut (LOC)	≤ Regular LOC	ADOC = up to 50% x dia.	ADOC = up to 1.5 x dia. RDOC = 30% to 50% of dia.	ADOC = LOC RDOC = 15% to 25% of dia.	ADOC = LOC RDOC = 3% to 5% of dia.
	> Regular LOC	We recommend using reduced neck (RN) tooling for long reach	ADOC = up to 1 x dia. RDOC = 20% to 30% of dia.	ADOC = up to 2 x dia. RDOC = 10% to 15% of dia.	ADOC = up to 3 x dia. RDOC = 3% to 5% of dia.



Depth of Cut Guide: REDUCED NECK STYLE

		Slotting (S)	Heavy Roughing (HR)	Light Roughing (LR)	Finishing (F)
Length Below Shank (LBS)	≤ Regular LBS	ADOC = up to 50% of dia.	ADOC = up to 1 x dia. RDOC = 30% to 50% of dia.	ADOC = LOC RDOC = 15% to 25% of dia.	ADOC = LOC RDOC = 3% to 5% of dia.
	> Regular LBS	ADOC = up to 25% of dia.	ADOC = up to 40% of dia. RDOC = 15% to 25% of dia.	ADOC = up to 75% of dia. RDOC = 10% to 15% of dia.	ADOC = up to 1x dia. RDOC = 3% to 5% of dia.



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