SYNERGY

Tungsten Carbide Drilling Products

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AMERISERV SUPPLY

SYNERGY

Our Story

For over 30 years, the professionals at AmeriServ Supply have been providing quality products and memorable customer experiences. And now, they proudly offer the Synergy Carbide™ brand of drilling and hole opening products for the energy industry.

Available exclusively through AmeriServ Supply, the broad offering includes a wide range of chisel, conical, and ovoid profile compacts for tri-cone drilling and hole opening applications, as well as a complete line of gage and wear protection products, including serrated stabilizers and domed compacts. Rounding out the offering is a comprehensive line of inserts for drag bits, an array of industry- standard non-shrouded and threaded fluid nozzles, as well as CrushCut™ crushed carbide composite rods and grit for non-critical cutting and wear applications.

At Your Service

More than just another carbide distributor. As a distributor, AmeriServ Supply offers a broad array of carbide products from a host of domestic and global manufacturers, ensuring the most economical, highest quality products available. But we are also a manufacturer with full design capability, comprehensive process knowledge, and decades of metallurgical expertise. From legacy items abandoned by other manufacturers to your latest idea, we can help.

We are committed to providing exceptional customer care. Our friendly and experienced team is available 24/7 for service and technical support. Whether it's product selection, process optimization, or troubleshooting, our 30 years of manufacturing expertise and industry knowledge are at your service.

Recycling Has Never Been Easier

Our sustainability initiative allows our customers to become part of the effort by recycling scrap tungsten carbide materials. Our sister company, Tungsten Carbide Recycling LLC, arranges freight, sorts and weighs your material, and provides detailed settlement reports along with prompt payment.

It couldn't be easier to do your part to preserve and protect our environment. Visit www.tungstencarbiderecycling.com for more information.

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SYNERGY

Grade	Cobalt %	Grain Size	Hardness (Ra)	T.R.S. (p.s.i.)	Product / Application
SC106	6	Medium / Coarse	90.2	350,000	Ovoid inserts for percussion and hammer bits
SC106M	6	Medium	90.9	350,000	Ovoid inserts for percussion and hammer bits
SC108M	8	Medium	90.0	360,000	Conical and ovoid inserts for rotary cone, percussion and hammer bits
SC110C	10	Coarse	87.8	420,000	Chisel, ballistic and conical inserts for rotary cone bits
SC1010	10	Medium / Coarse	88.3	420,000	Roller reamers, stabilizers and inserts for geophysical / drag bits
SC110	10	Medium / Coarse	88.5	445,000	Chisel, ballistic and conical inserts for rotary cone bits
SC110N	10 (nickel)	Fine / Medium	90.5	350,000	Non-magnetic grade for wear protection inserts
SC110M	10.25	Medium	89.0	435,000	Chisel, ballistic and conical inserts for rotary cone bits
SC1010M	10	Medium	89.5	435,000	Roller reamers, stabilizers and inserts for geophysical / drag bits
SC111M	11	Medium	88.8	430,000	Chisel, ballistic and conical inserts for rotary cone bits
SC1012C	12	Coarse	87.0	430,000	Inserts for geophysical / drag bits
SC1012	12	Medium / Coarse	87.4	420,000	Inserts for geophysical / drag bits and gage protection
SC1012M	12	Medium	88.0	425,000	Inserts for geophysical / drag bits
SC113	13	Medium	88.2	430,000	Ballistic and chisel inserts for rotary cone bits
SC116M	16	Medium	86.7	450,000	Ballistic and chisel inserts for rotary cone bits, PDC substrates

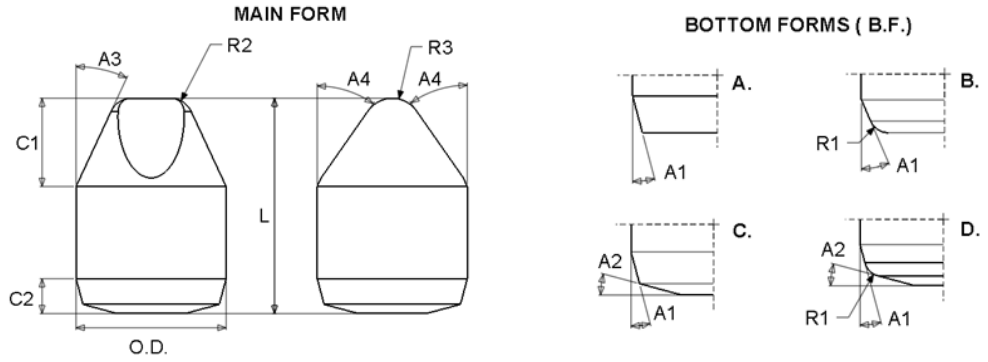
Grade Dynamics Chart		…these are affected like this:				
		Cobalt %	Grain Size	Wear Resistance	Hardness	Toughness
As these increase…	Cobalt %	-	No relation	▼	▼	▲
	Grain Size	No relation	-	▼	▼	▲
	Wear Resistance	▼	▼	-	▲	▼
	Hardness	▼	▼	▲	-	▼
	Toughness	▲	▲	▼	▼	-

Profile compacts are used in rotary cone and percussive bits to drill through all types of rock formations. Choosing the right product for a particular drilling operation depends on the compressive strength and silica content of the type of formation being drilled, the direction of the drilling, whether any rock joints or fractures exist, and other factors. While Synergy Carbide offers several styles of profile compacts made in grades specifically designed for use in particular types of formations, we are also able to manufacture to customer specifications. The information below may be used a guideline for choosing a product.

Rock Formation	Formation Examples	Insert Extension Shape	Extension Length	Suggested Cobalt % of Grade
Soft to Medium	Anhydrites, soft limestones, sands, dolomites, firm shales, mudstone	Chisel, scoop chisel	Long	10-16
Medium	Sands, shales, salts, gumbo, clays	Ballistic	Medium/Long	10-13
Medium/Hard to Hard	Dolomites, hard limestones, hard sandy shales, marble	Conical, double conical	Medium	8-10
Hard to Very Hard	Sandy shales, dolomites	Ballistic	Medium/Short	6-8
Very Hard	Basalt, quartzite, granite, cherts, quartzitic sands, taconite	Ovoid	Short	6

Chisel

For high penetration rates in soft formations using rotary cone bits



Part Number	Dimensions (inches)											
	Main Form								Bottom Form			
	O.D.	L	C1	C2	A3	A4	R2	R3	TYPE	A1	A2	R1
M17752	.1900	.312	.089	.041	25°	43°	.029	.038	D	15°	15°	.010
CHZ1/4X350D1	.2530	.350	.115	.040	33°	45°	.031	.047	B	15°	-	.020
CHZ1/4X350D2	.2550	.350	.115	.040	33°	45°	.031	.047	B	15°	-	.020
CHZ1/4X350D3	.2570	.350	.115	.040	33°	45°	.031	.047	B	15°	-	.020
M17183	.2580	.379	.188	.060	31°	45°	.038	.050	C	15°	15°	-
CHZ1/4X350D4	.2590	.350	.115	.040	33°	45°	.031	.047	B	15°	-	.020
M17305	.2600	.366	.150	.059	25°	35°	.098	.050	C	15°	15°	-
M17274	.2610	.295	.118	.060	31°	45°	.038	.050	C	15°	15°	-
M17302	.2610	.318	.188	.060	31°	45°	.038	.050	C	15°	15°	-
CHZ516X410RBD1	.3150	.410	.155	.050	20°	34°	.050	.100	B	15°	-	.020
M17103D1	.3160	.456	.206	.079	20°	35°	.094	.094	C	15°	15°	-
CHZ516X410RBD2	.3170	.410	.155	.050	20°	34°	.050	.100	B	15°	-	.020
M17103D4	.3170	.456	.206	.079	20°	35°	.094	.094	C	15°	15°	-
CHZ516X410RBD3	.3190	.410	.155	.050	20°	34°	.050	.100	B	15°	-	.020
M17103D2	.3190	.456	.206	.079	20°	35°	.094	.094	C	15°	15°	-
M17301	.3210	.356	.156	.078	20°	35°	.094	.094	C	15°	15°	-
CHZ516X410RBD4	.3210	.410	.155	.050	20°	34°	.050	.100	B	15°	-	.020
M17103D3	.3210	.456	.206	.079	20°	35°	.094	.094	C	15°	15°	-
M17103	.3230	.456	.206	.079	20°	35°	.094	.094	C	15°	15°	-
M17788	.3700	.455	.170	.054	25°	45°	.125	.094	C	15°	15°	-

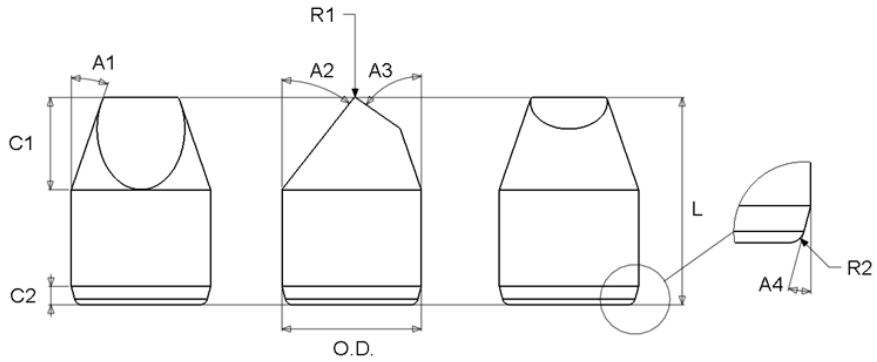
Continued on next page

Chisel (continued)

Part Number	Dimensions (inches)											
	Main Form								Bottom Form			
	O.D.	L	C1	C2	A3	A4	R2	R3	TYPE	A1	A2	R1
CHZ375X560	.3750	.560	.250	.062	23°	26°	.047	.109	A	15°	-	-
M17774	.3860	.486	.171	.058	16°	45°	.080	.050	B	15°	-	.015
M17277	.3860	.491	.217	.082	22°	35°	.060	.090	C	15°	15°	-
M17276	.3860	.585	.217	.082	22°	35°	.060	.090	C	15°	15°	-
B10102D1	.4300	.562	.245	.075	20°	35°	.070	.125	C	15°	15°	-
M17433	.4460	.641	.245	.075	20°	35°	.070	.125	C	15°	15°	-
B10102	.4480	.562	.245	.075	20°	35°	.070	.125	C	15°	15°	-
M17633D5	.4940	.740	.271	.100	20°	31°	.075	.160	C	15°	15°	-
B10134D1	.5040	.622	.284	.129	20°	32°	.125	.156	C	16°	15°	-
M17633D1	.5040	.740	.271	.100	20°	31°	.075	.160	C	15°	15°	-
B10134D2	.5050	.622	.284	.129	20°	32°	.125	.150	C	16°	15°	-
M17663D2	.5050	.740	.271	.100	20°	31°	.075	.160	C	15°	15°	-
B101034D3	.5060	.622	.284	.129	20°	32°	.125	.156	C	16°	15°	-
M17633D3	.5060	.740	.271	.100	20°	31°	.075	.160	C	15°	15°	-
B10134D4	.5070	.622	.284	.129	20°	32°	.125	.156	C	16°	15°	-
M17633D4	.5070	.740	.271	.100	20°	31°	.075	.160	C	15°	15°	-
M17633	.5080	.740	.271	.100	20°	31°	.075	.160	C	15°	15°	-
B10140	.5100	.685	.290	.112	22°	40°	.055	.130	C	15°	15°	-
B10134	.5130	.622	.284	.129	20°	32°	.125	.156	C	16°	15°	-
M17196D1	.6230	.910	.440	.096	20°	28°	.125	.156	C	15°	15°	-
M17196D2	.6250	.910	.440	.096	20°	28°	.125	.156	C	15°	15°	-
M17196	.6360	.910	.440	.096	20°	28°	.125	.156	C	15°	15°	-

Scoop chisel

For high penetration rates in soft formations using rotary cone bits

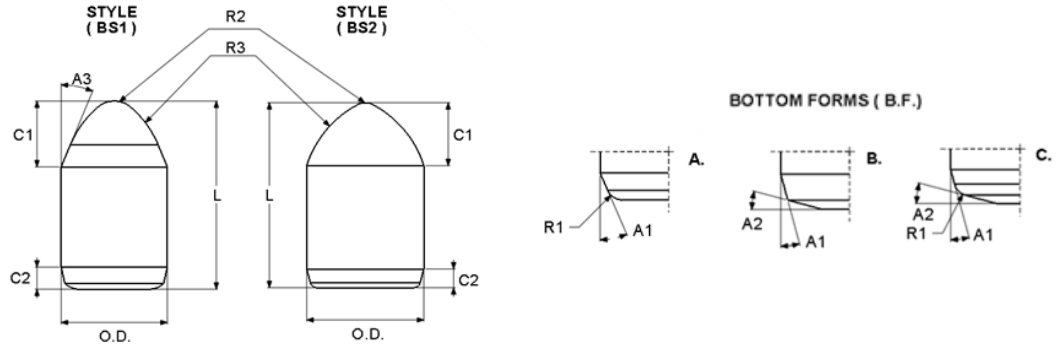


Part Number	Dimensions (inches)									
	Main Form								Bottom Form	
	O.D.	L	C1	C2	A1	A2	A3	R1	A4	R2
CHZ3775X562MOD	.3775	.562	.250	.050	19°	38°	55°	.005	15°	.020
CHZ4375X650MOD	.4375	.625	.250	.055	19°	38°	55°	.005	15°	.020
M17670	.5030	.852	.313	.064	12°	25°	60°	.015	15°	.050

SYNERGY

Ballistic

For medium-hard formations in rotary cone and percussion bits

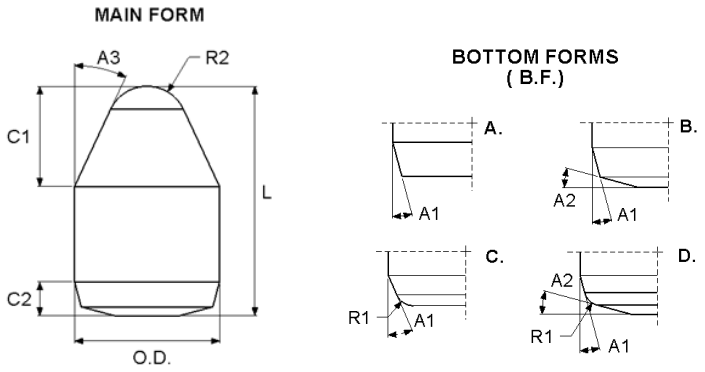


Part Number	Dimensions (inches)											
	Main Form								Bottom Form			
	O.D.	L	C1	C2	A3	R2	R3	STYLE	TYPE	A1	A2	R1
M17546D1	.3770	.605	.206	.061	-	.050	.342	BS2	A	15°	-	.021
M17536D2	.3772	.663	.232	.078	22°	.088	.354	BS1	A	14°	-	.075
M17546D2	.3780	.605	.206	.610	-	.050	.342	BS2	A	15°	-	.021
M17536D4	.3782	.663	.232	.078	22°	.088	.354	BS1	A	14°	-	.075
M17536D5	.3783	.663	.232	.078	22°	.088	.354	BS1	A	14°	-	.075
M17659D1	.3795	.625	.232	.078	22°	.088	.354	BS1	A	14°	-	.075
M17536D1	.3800	.663	.232	.078	22°	.088	.354	BS1	A	14°	-	.075
M17702D1	.3810	.625	.206	.061	-	.050	.342	BS2	A	15°	-	.021
M17659	.3830	.625	.232	.078	22°	.088	.354	BS1	A	14°	-	.075
M17536D2	.3830	.663	.232	.078	22°	.088	.354	BS1	A	14°	-	.075
M17546D3	.3870	.605	.206	.061	-	.050	.342	BS2	A	15°	-	.021
M17546	.3900	.605	.206	.061	-	.050	.342	BS2	A	15°	-	.021
M17702	.3900	.625	.206	.061	-	.050	.342	BS2	A	15°	-	.021
M17644D1	.4360	.528	.200	.075	-	.100	.300	BS2	B	15°	15°	-
M17644D2	.4375	.528	.200	.075	-	.100	.300	BS2	B	15°	15°	-
M17644D3	.4385	.528	.200	.075	-	.100	.300	BS2	B	15°	15°	-
M17644D4	.4395	.528	.200	.075	-	.100	.300	BS2	B	15°	15°	-
M17644D5	.4405	.528	.200	.075	-	.100	.300	BS2	B	15°	15°	-
M17644D6	.4420	.528	.200	.075	-	.100	.300	BS2	B	15°	15°	-
M17525D1	.4440	.874	.295	.061	22°	.109	.433	BS1	A	15°	-	.075
M17644	.4460	.528	.200	.075	-	.100	.300	BS2	B	15°	15°	-
M17525D1	.4460	.874	.295	.061	22°	.109	.433	BS1	A	15°	-	.075
M17544D4	.5000	.873	.335	.108	22°	.128	.512	BS1	A	18°	-	.076
M17547D3	.5000	.850	.313	.100	-	.125	.531	BS2	A	15°	-	.075
M17547D1	.5020	.850	.313	.100	-	.125	.531	BS2	A	15°	-	.075
M17544D5	.5022	.873	.335	.108	22°	.128	.512	BS1	A	18°	-	.760
M17517D1	.5027	.913	.335	.108	22°	.128	.512	BS1	A	18°	-	.076
M17547D2	.5030	.850	.313	.100	-	.125	.531	BS2	A	15°	-	.075
M17759	.5030	.875	.340	.097	23°	.125	.550	BS1	C	15°	15°	.015
M17517D3	.5037	.913	.335	.108	22°	.128	.512	BS1	A	18°	-	.076
M17544D1	.5040	.873	.335	.108	22°	.128	.512	BS1	A	18°	-	.076
M17701D1	.5050	.820	.313	.100	-	.125	.531	BS2	A	15°	-	.075
M17544D2	.5060	.873	.335	.108	22°	.128	.512	BS1	A	18°	-	.076
M17701	.5080	.820	.313	.100	-	.125	.531	BS2	A	15°	-	.075
M17547	.5080	.850	.313	.100	-	.125	.531	BS2	A	15°	-	.075
M17544D3	.5080	.873	.335	.108	22°	.128	.512	BS1	A	18°	-	.076
M17517	.5080	.913	.335	.108	22°	.128	.512	BS1	A	18°	-	.076
M17757	.5655	.793	.350	.090	-	.094	.512	BS2	C	15°	15°	.020

SYNERGY

Conical

For medium-hard formations in rotary cone and percussion bits



Part Number	Dimensions (inches)									
	Main Form						Bottom Form			
	O.D.	L	C1	C2	A3	R2	TYPE	A1	A2	R1
M17628D5	.1880	.235	.109	.033	30°	.063	C	23°	-	.020
M17753	.1900	.210	.069	.041	35°	.090	D	15°	15°	.010
M17628D1	.1900	.235	.109	.033	30°	.063	C	23°	-	.020
M17628D2	.1910	.235	.109	.033	30°	.063	C	23°	-	.020
M17628D3	.1920	.235	.109	.033	30°	.063	C	23°	-	.020
M17628D4	.1930	.235	.109	.033	30°	.063	C	23°	-	.020
M17628	.2000	.235	.109	.033	30°	.063	C	23°	-	.020
M17520D1	.2515	.320	.130	.071	30°	.094	B	15°	15°	-
M17651D1	.2515	.350	.130	.047	30°	.094	A	15°	-	-
M17520D2	.2530	.320	.130	.071	30°	.094	B	15°	15°	-
M17651D2	.2530	.350	.130	.047	30°	.094	A	15°	-	-
CONC1/4X360D1	.2530	.360	.125	.040	30°	.094	C	15°	-	.020
M17520D3	.2550	.320	.130	.071	30°	.094	B	15°	15°	-
M17651D3	.2550	.350	.130	.047	30°	.094	A	15°	-	-
CONC1/4X360D2	.2550	.360	.125	.040	30°	.094	C	15°	-	.020
M17520D4	.2570	.320	.130	.071	30°	.094	B	15°	15°	-
CONC1/4X360D3	.2570	.360	.125	.040	30°	.094	C	15°	-	.020
M17520	.2580	.320	.130	.071	30°	.094	B	15°	15°	-
M17651	.2580	.350	.130	.047	30°	.094	A	15°	-	-
M17723	.2580	.400	.175	.059	25°	.070	B	15°	15°	-
CONC1/4X360D4	.2590	.360	.125	.040	30°	.094	C	15°	-	.020
M17651D4	.2605	.350	.130	.047	30°	.094	A	15°	-	-
M17684D1	.3140	.450	.226	.068	21°	.109	D	15°	15°	.031
M17523D2	.3150	.503	.155	.093	36°	.100	D	15°	15°	.003
M17523D3	.3153	.503	.155	.093	36°	.100	D	15°	15°	.003
M17523D1	.3160	.503	.155	.093	36°	.100	D	15°	15°	.003
M17638D1	.3170	.400	.149	.068	36°	.100	B	15°	15°	-
M17523D5	.3180	.503	.155	.093	36°	.100	D	15°	15°	.003
M17523D4	.3183	.503	.155	.093	36°	.100	D	15°	15°	.003
M17638D2	.3190	.400	.149	.068	36°	.100	B	15°	15°	-
M17638D3	.3210	.400	.149	.068	36°	.100	B	15°	15°	-
M17638	.3260	.400	.149	.068	36°	.100	B	15°	15°	-
M17684	.3290	.450	.226	.068	21°	.109	D	15°	15°	.031
M17523	.3360	.503	.155	.093	36°	.100	D	15°	15°	.003
M17505D5	.3768	.605	.189	.061	36°	.100	C	15°	-	.021

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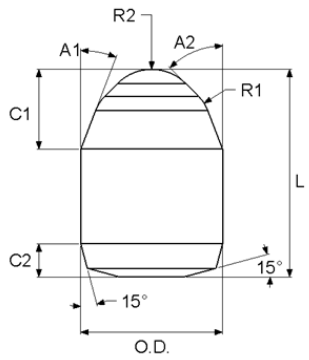
SYNERGY

Conical (continued)

Part Number	Dimensions (inches)									
	Main Form						Bottom Form			
	O.D.	L	C1	C2	A3	R2	TYPE	A1	A2	R1
M17505D2	.3770	.605	.189	.061	36°	.100	C	15°	-	.021
M17505D3	.3783	.605	.189	.061	36°	.100	C	15°	-	.021
M17187D1	.3790	.504	.226	.082	21°	.148	B	15°	15°	-
M17505D1	.3800	.605	.189	.061	36°	.100	C	15°	-	.021
M17505D4	.3813	.605	.189	.061	36°	.100	C	15°	-	.021
M17436	.3830	.528	.200	.071	25°	.148	B	15°	15°	-
M17685	.3840	.547	.274	.082	21°	.120	B	14°	15°	-
M17715	.3860	.497	.205	.082	25°	.148	B	14°	15°	-
M17187	.3860	.504	.226	.082	21°	.148	B	15°	15°	-
M17505	.3880	.605	.189	.061	36°	.100	C	15°	-	.021
M17643D1	.4360	.612	.265	.075	17°	.184	B	15°	15°	-
M17643D2	.4375	.612	.265	.075	17°	.184	B	15°	15°	-
M17643D3	.4385	.612	.265	.075	17°	.184	B	15°	15°	-
M17643D4	.4395	.612	.265	.075	17°	.184	B	15°	15°	-
M17643D5	.4405	.612	.265	.075	17°	.184	B	15°	15°	-
M17643D6	.4415	.612	.265	.075	17°	.184	b	15°	15°	-
M17582-1	.4420	.531	.265	.075	17°	.184	b	15°	15°	-
M17643D7	.4425	.612	.265	.075	17°	.184	B	15°	15°	-
M17643D8	.4435	.612	.265	.075	17°	.184	B	15°	15°	-
M17582-2	.4440	.531	.265	.075	17°	.184	B	15°	15°	-
M17643D9	.4445	.612	.265	.075	17°	.184	B	15°	15°	-
M17582-3	.4460	.531	.265	.075	17°	.184	B	15°	15°	-
M17643D10	.4460	.612	.265	.075	17°	.184	B	15°	15°	-
M17686	.4520	.590	.300	.104	15°	.184	B	15°	15°	-
M17689	.4520	.622	.303	.104	27°	.109	B	15°	15°	-
M17365	.5090	.679	.281	.111	30°	.153	B	18°	15°	-
M17692	.5090	.685	.325	.111	21°	.182	B	18°	15°	-
M17722	.5090	.685	.326	.111	27°	.133	B	18°	15°	-
M17691	.5100	.704	.322	.111	26°	.133	B	18°	15°	-
M17776	.5130	.655	.281	.101	26°	.185	C	16°	-	.015
M17716	.5730	.629	.309	.081	25°	.218	B	15°	15°	-
M17717	.5730	.734	.345	.081	27°	.175	B	15°	15°	-
M17719	.5730	.875	.430	.081	21°	.172	B	15°	15°	-
M17773	.5740	.669	.375	.083	26°	.155	C	18°	-	.015
M17777	.5740	.716	.324	.082	23°	.220	C	18°	-	.015
M17362D1	.6294	1.050	.350	.100	31°	.188	C	15°	-	.075
M17362	.6330	1.055	.350	.100	31°	.188	C	15°	-	.075
M17771	.6360	.7680	.442	.058	27°	.145	C	15°	-	.015
M17778	.6360	.8770	.437	.058	21°	.213	C	15°	-	.015
M17721	.6360	.9100	.416	.085	15°	.264	B	15°	15°	-
M17711	.7581	1.186	.596	.069	27°	.118	C	15°	-	.020
M17710	.7639	1.186	.607	.089	27°	.118	C	15°	-	.020
M17661D1	.7650	1.000	.541	.050	21°	.250	C	15°	-	.020
M17661	.7670	1.000	.541	.050	21°	.250	C	15°	-	.020
CONC814X11125	.8145	1.112	.430	.129	28°	.313	B	15°	20°	-

Double conical

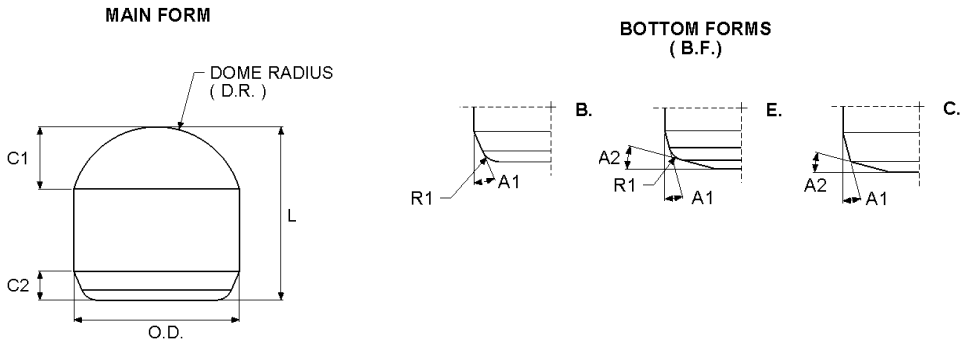
For medium-hard formations in rotary cone bits



Part Number	Dimensions (inches)							
	Main Form							
	O.D.	L	C1	C2	A1	A2	R1	R2
M17383	.3210	.384	.122	.078	30°	75°	.062	.062
M17163	.4520	.650	.250	.104	21°	45°	.125	.150
M17290	.5130	.660	.281	.131	20°	45°	.125	.185

Ovoid

For very hard formations in percussion and rotary cone bits



Part Number	Dimensions (inches)							
	Main Form					Bottom Form		
	O.D.	L	C1	C2	D.R.	TYPE	A1	R1
M17678	.4720	.787	.157	.092	.256	B	15°	.076
503012RB	.5030	.750	.173	.069	.266	B	15°	.076
562512RB	.5625	.750	.202	.082	.297	B	15°	.040
M17727D1	.5625	.750	.210	.114	.297	E	15°	.020
564016RB	.5640	1.000	.204	.085	.297	B	15°	.040
M17727D1	.5760	.750	.210	.114	.297	E	15°	.020
627015RB	.6270	.937	.232	.085	.328	B	15°	.075
628014RB	.6280	.875	.233	.062	.328	B	15°	.075
63015RB	.6300	.937	.237	.090	.328	B	15°	.075
632515RB	.6325	.937	.241	.095	.328	B	15°	.075
633015RB	.6330	.937	.242	.096	.328	B	15°	.075
634015RB	.6340	.937	.244	.098	.328	B	15°	.075
63501RB	.6350	.937	.246	.100	.328	B	15°	.075
636013RB	.6360	.812	.246	.110	.328	B	15°	.075
642015RBD3	.6360	.938	.243	.099	.334	B	15°	.076
642015RBD2	.6370	.938	.243	.099	.334	B	15°	.076
638015RB	.6380	.937	.252	.105	.328	B	15°	.075
639015RB	.6390	.937	.254	.107	.328	B	15°	.075

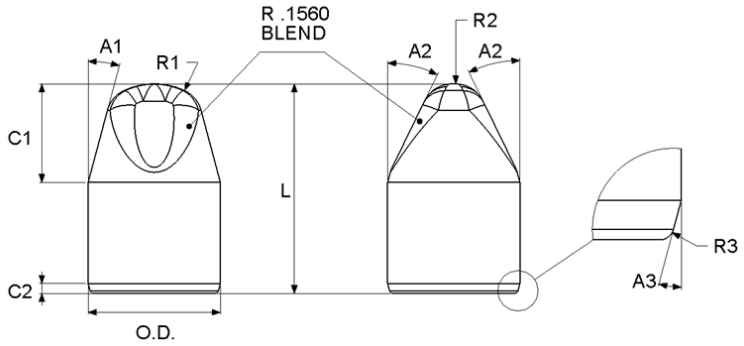
Continued on next page

Ovoid (continued)

Part Number	Dimensions (inches)							
	Main Form					Bottom Form		
	O.D.	L	C1	C2	D.R.	TYPE	A1	R1
642015RBD1	.6420	.938	.243	.099	.334	B	15°	.076
7120X945RBD1	.7120	.945	.270	.100	.371	B	15°	.075
7120X945RB	.7220	.945	.270	.100	.371	B	15°	.075
M17558D1	.7480	1.181	.275	.091	.391	B	15°	.075
750X760RBD1	.7500	.760	.293	.113	.391	B	15°	.075
751017RB	.7510	1.062	.282	.087	.391	B	15°	.075
753018RB	.7530	1.125	.286	.096	.391	B	15°	.075
754017RB	.7540	1.062	.287	.096	.391	B	15°	.075
755014RBD1	.7550	.875	.303	.100	.391	B	15°	.075
755017RBD1	.7550	1.062	.295	.100	.391	B	15°	.075
757017RB	.7570	1.062	.293	.098	.391	B	15°	.075
758017RB	.7580	1.062	.295	.100	.391	B	15°	.075
M17558	.7580	1.180	.275	.091	.391	B	15°	.075
760017RB	.7600	1.062	.291	.107	.391	B	15°	.075
7500X760RB	.7670	.760	.293	.113	.391	B	15°	.075
755017RBD1	.7680	1.062	.295	.100	.391	B	15°	.075
770017RB	.7700	1.063	.323	.113	.391	C	15°	.075
755014RB	.7720	.875	.303	.100	.391	B	15°	.075

Modified chisel

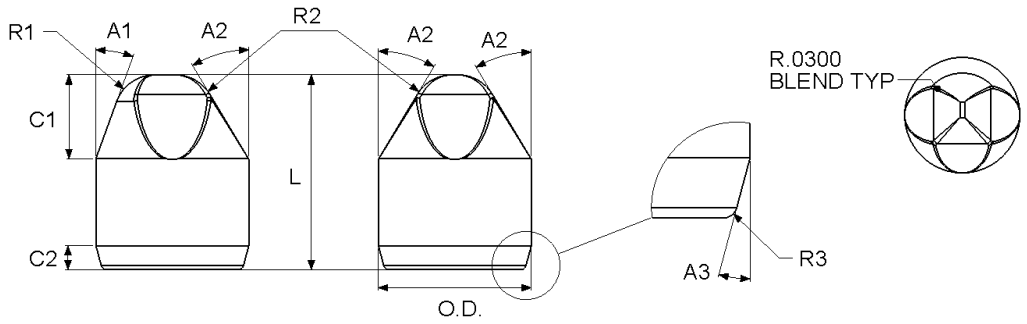
For high penetration rates in soft formations using rotary cone bits



Part Number	Dimensions (inches)									
	Main Form								Bottom Form	
	O.D.	L	C1	C2	A1	A2	R1	R2	A3	R3
CHZ750X1187	.7500	1.187	.558	.056	15°	26°	.172	.172	15°	.020
CHZ770X1187	.7700	1.187	.558	.056	15°	26°	.172	.172	15°	.020

Wedge-crested chisel

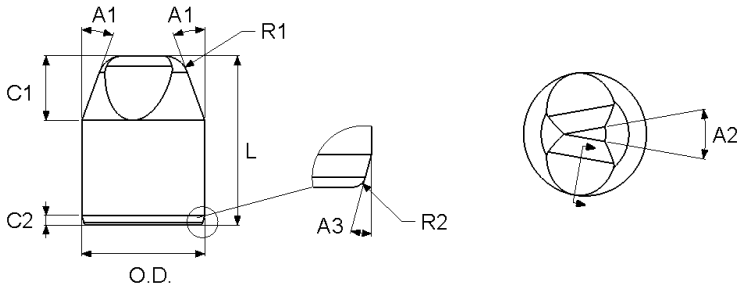
For use on the outer (gage) row of rotary cone bits



Part Number	Dimensions (inches)									
	Main Form								Bottom Form	
	O.D.	L	C1	C2	A1	A2	R1	R2	A3	R3
CHZ568X723	.5680	.723	.311	.089	20°	31°	.150	.150	15°	.021

Wedge-crested offset chisel

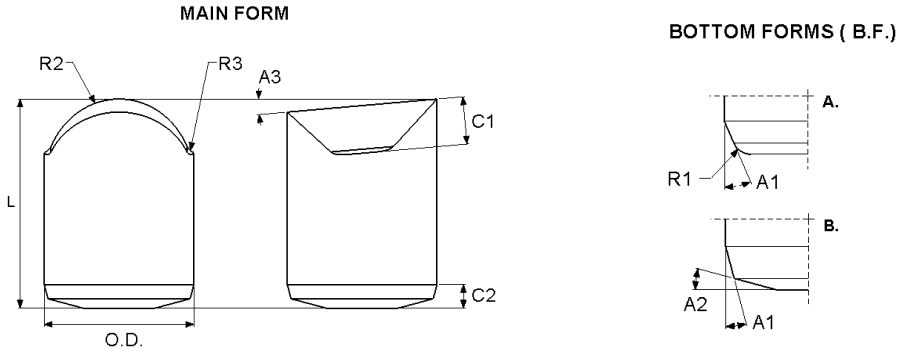
For use on the outer (gage) row of rotary cone bits



Part Number	Dimension (inches)								
	Main Form							Bottom Form	
	O.D.	L	C1	C2	A1	A2	R1	A3	R2
B1728	.6282	.863	.329	.050	20°	20°	.125	35°	.020

Wing-tip chisel

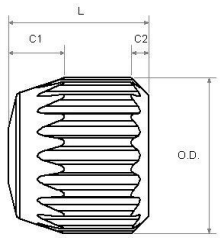
For raised bore drilling

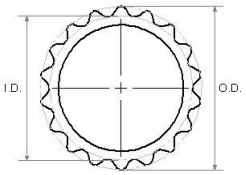


Part Number	Dimensions (inches)										
	Main Form							Bottom Form			
	O.D.	L	C1	C2	A3	R2	R3	TYPE	A1	A2	R1
CHZ3775X487M	.3775	.487	.400	.0790	5°	.2190	.020	A	15°	-	.030
CHZ24375X612	.4375	.612	.139	.0690	5°	.2187	.020	B	15°	15°	-

All gage and wear protection compacts and stabilizer inserts are produced in our standard grade, SC1010, which exhibits a good balance of the wear resistance and toughness essential for reducing wear on friction-heavy gage surfaces of rotary cone and diamond bits. Rectangular stabilizers and round wear protection inserts are available from inventory in our standard grade, SC1012, specially formulated to enhance wear characteristics.

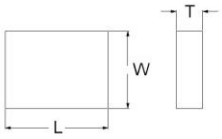
Serrated stabilizers

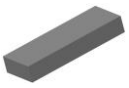




Part Number	Dimensions (inches)					Model
	O.D.	I.D.	C1	C2	Length (L)	
M17745	.273	.242	.100	.031	1/4	
M17683	.334	.309	.059	.015	.145	
M17504	.334	.309	.059	.015	.200	
M17457	.334	.309	.059	.015	.268	
M10025	.406	.374	.125	.031	1/4	
M17697	.406	.374	.125	.023	.305	
M10040	.406	.374	.103	.031	5/16	
M10020	.406	.374	.125	.031	3/8	
M17519	.458	.418	.137	.015	1/4	
M17642	.458	.418	.137	.015	.348	
M17649	.458	.418	.137	.015	7/16	
M17420	.458	.418	.137	.015	.475	
M17580	.583	.551	.140	.015	1/4	
M17623	.583	.551	.140	.015	5/16	
M10038	.583	.551	.139	.015	3/8	
M10010	.583	.551	.139	.015	1/2	
SDS406438	.406	.374	.125	.122	7/16	
SDS583625	.583	.551	.139	.175	5/8	

Rectangular stabilizers

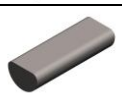


Part Number	Length (L)	Width (W)	Thickness (T)	Model
TILE6.5X5X2	6.5 mm	5 mm	2 mm	
TILE13X5X2	13 mm	5 mm	2 mm	
TILE6.5X5X3	6.5 mm	5 mm	3 mm	
TILE13X5X3	13 mm	5 mm	3 mm	
TILE13X5X3.2	13 mm	5 mm	3.2 mm	
TILE13X5X4	13 mm	5 mm	4 mm	

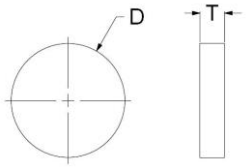
Trapezoidal stabilizers

Part Number	Dimensions (inches)			Model
	Width	Thick. / Height	Length	
ANC803	3/8	1/4	1/2	
ANC804	3/8	1/4	1	

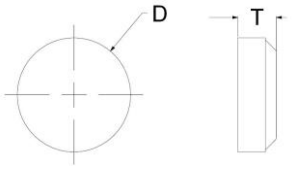
Half-round stabilizers

ANC9228	3/8	1/4	1	

Round wear protection inserts

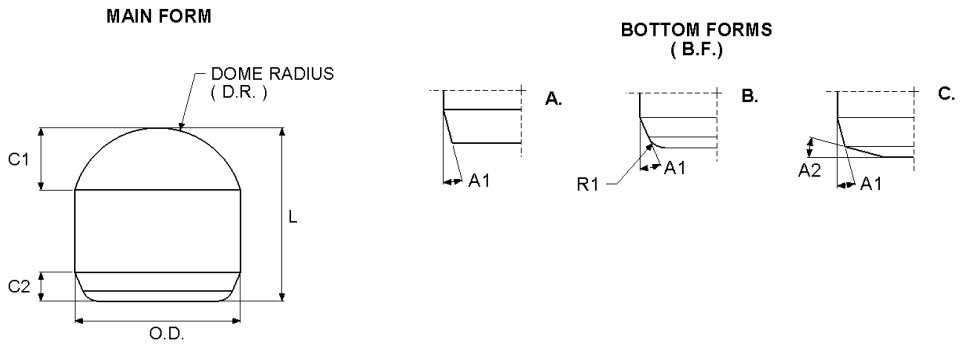


Part Number	Diameter (D)	Thickness (T)	Model
DISC240X200	.240	.200	
M17632	.245	.125	
DISC245X133	.245	.133	
DISC245X200	.245	.200	
DISC370X080	.370	.080	
DISC370X133	.370	.133	
DISC370X200	.370	.200	
DISC370X311	.370	.311	
M17804	.375	.125	
M17805	.375	.188	
M17806	.375	.250	
M17510	.375	.305	
M17648D4	.367	.125	
M17648D5	.367	.133	
M17648D6	.367	.188	
M17648D2	.367	.265	
M17648D1	.367	.290	
M17648D3	.367	.365	



Gage and wear protection compacts – ovoid

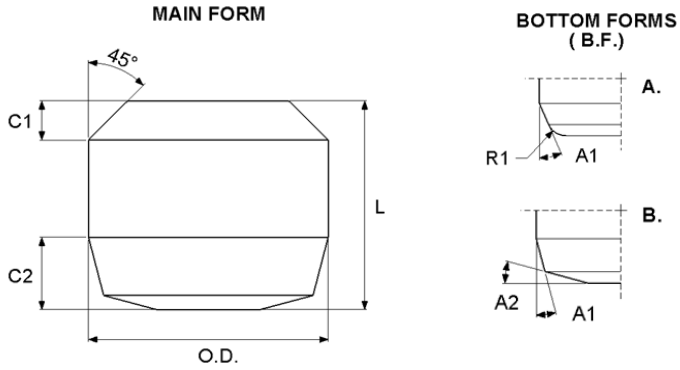
For use on roller reamers or other downhole tools where domed gage protection is needed



Part Number	Dimensions (inches)								
	Main Form					Bottom Form			
	O.D.	L	C1	C2	D.R.	TYPE	A1	A2	R1
M17521D2	.1900	.205	.074	.034	.102	B	23°	-	.020
M17521D1	.1915	.205	.074	.034	.102	B	23°	-	.020
M17521	.2020	.205	.074	.034	.102	B	23°	-	.020
M171821D1	.2500	.338	.081	.060	.141	C	15°	15°	-
M17545D6	.2510	.310	.076	.060	.141	C	15°	15°	-
M17545D1	.2515	.310	.076	.060	.141	C	15°	15°	-
M17303D2	.2520	.256	.083	.076	.141	C	15°	15°	-
M17545D2	.2530	.310	.076	.060	.141	C	15°	15°	-
M17645D1	.2535	.478	.076	.031	.141	A	45°	-	-
M17303D3	.2540	.256	.083	.076	.141	C	15°	15°	-
M17545D3	.2550	.310	.076	.060	.141	C	15°	15°	-
M17545D5	.2555	.310	.076	.060	.141	C	15°	15°	-
M17303D1	.2560	.256	.083	.076	.141	C	15°	15°	-
M17545D4	.2570	.310	.076	.060	.141	C	15°	15°	-
M17545	.2580	.310	.076	.060	.141	C	15°	15°	-
M17182	.2610	.338	.081	.060	.140	C	15°	15°	-
M17698	.2630	.248	.048	.076	.196	C	15°	15°	-
M17303	.2630	.256	.083	.076	.141	C	15°	15°	-
M17775	.2630	.266	.084	.055	.140	B	15°	-	.010
3816RB	.3810	.375	.133	.065	.203	B	15°	-	.020
M17275	.3850	.400	.129	.082	.203	C	15°	15°	-
M17728	.3880	.633	.156	.083	.194	C	15°	15°	-
M17737	.3950	.299	.145	.059	.203	B	15°	-	.008
M17738D1	.4390	.351	.162	.062	.235	B	15°	-	.010
4448RB	.4440	.500	.160	.089	.234	B	15°	-	.020
M17738D1	.4550	.351	.162	.062	.235	B	15°	-	.010
M17402	.5080	.542	.177	.076	.271	C	15°	15°	-
M17625	.5080	.585	.187	.105	.266	C	15°	15°	-
M17624	.5080	.614	.180	.105	.266	C	15°	15°	-
5698RB	.5690	.500	.212	.094	.297	B	15°	-	.040

SYNERGY

Gage and wear protection compacts – flat

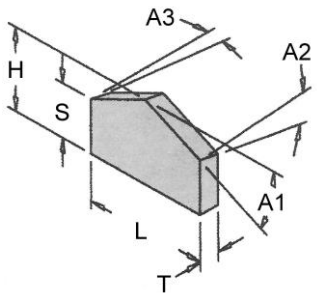


Part Number	Dimensions (inches)							
	Main Form				Bottom Form			
	O.D.	L	C1	C2	TYPE	A1	A2	R1
M17767	.1580	.175	.010	.035	A	15°	-	.020
GAGE190X156D1	.1900	.156	.019	.036	A	15°	-	.020
M17084D1	.1900	.186	.020	.062	B	15°	15°	-
GAGE190X156D2	.1920	.156	.019	.036	A	15°	-	.020
M17084D2	.1920	.186	.020	.062	B	15°	15°	-
M17528	.1920	.186	.020	.057	B	15°	15°	-
M17084D3	.1940	.186	.020	.062	B	15°	15°	-
GAGE190X156D3	.1940	.156	.019	.036	A	15°	-	.020
GAGE190X156D4	.1960	.156	.019	.036	A	15°	-	.020
M17084D4	.1960	.186	.020	.062	B	15°	15°	-
M178084D5	.1980	.186	.020	.062	B	15°	15°	-
M17084	.1990	.186	.020	.062	B	15°	15°	-
M17817	.2520	.220	.041	.076	B	15°	15°	-
M17786	.2520	.233	.041	.098	B	15°	15°	-
M17828D4	.2530	.210	.020	.040	A	15°	-	.020
M17437D1	.2540	.219	.000	.076	B	15°	15°	-
M17828D3	.2550	.210	.020	.040	A	15°	-	.020
M17828D2	.2570	.210	.020	.040	A	15°	-	.020
M17828D1	.2590	.210	.020	.040	A	15°	-	.020
M17437	.2630	.219	.000	.076	B	15°	15°	-
B10116	.2630	.219	.041	.076	B	15°	15°	-
B10172D1	.3130	.275	.015	.085	B	15°	14°	-
B10172D2	.3140	.275	.015	.085	B	15°	14°	-
B10172D3	.3150	.275	.015	.085	B	15°	14°	-
B10172D4	.3155	.275	.015	.085	B	15°	14°	-
B10172	.3250	.275	.015	.085	B	15°	14°	-
B10126D1	.3750	.250	.015	.071	B	15°	15°	-
M17751D1	.3790	.350	.025	.066	B	15°	15°	-
B10126	.3830	.250	.015	.071	B	15°	15°	-
M17750D1	.4420	.400	.025	.081	B	15°	15°	-
M17754D1	.4420	.400	.060	.081	B	15°	15°	-
M17703D1	.5000	.245	.000	.086	A	15°	-	.075
M17703	.5120	.245	.000	.086	A	15°	-	.075
M17488	.5710	.275	.015	.132	B	15°	15°	-
M17706	.5760	.437	.029	.060	A	15°	-	.075

SYNERGY

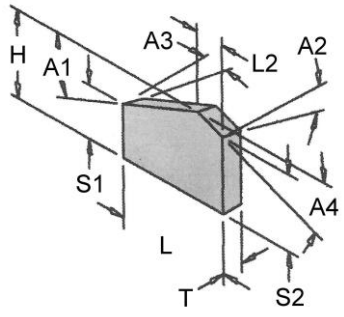
The components for a geophysical / drag bit are determined by the bit manufacturer. Unless otherwise specified, all inserts are produced in our standard grade, SC1010, which exhibits a good balance of the wear resistance and toughness essential in cutting softer rocks, sands and clays. This grade also performs well with the shearing action of the bit. All geophysical / drag bits inserts have a 45° degree chamfer at the base of the non-cutting side to facilitate brazing, unless the part number is italicized. All inserts are finished using our proprietary surface-treatment process for enhanced brazeability.

Symmetrical apex



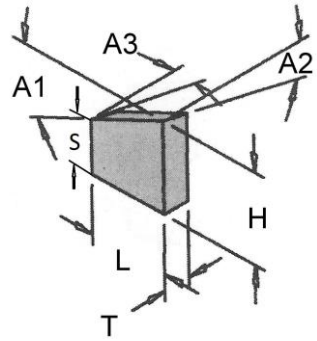
Part Number	Dimensions (inches)						
	Main Form				Angles		
	Length (L)	H	Thick (T)	S	A1	A2	A3
ANC240	1.000	.500	.125	.200	31°	10°	0°
ANC237	1.000	.500	.188	.200	31°	10°	0°
ANC386	1.000	.775	.188	.500	25°	10°	7°
ANC505	1.000	.875	.188	.625	25°	12°	0°
ANC462	1.125	.625	.188	.400	25°	10°	7°
ANC467	1.125	.625	.250	.420	20°	10°	3°
ANC466	1.125	.750	.250	.545	20°	10°	3°
ANC460	1.125	.775	.250	.500	25°	10°	7°
ANC465	1.125	.938	.250	.733	20°	10°	3°
ANC470	1.438	.875	.250	.613	20°	12°	7°
ANC471	1.438	.590	.250	.328	20°	12°	7°

Asymmetrical apex



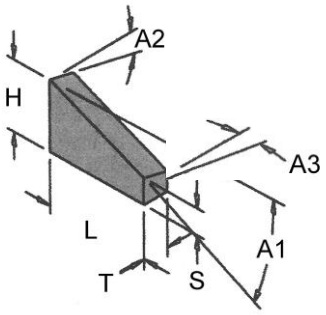
Part Number	Dimensions (inches)									
	Main Form						Angles			
	Length (L)	H	Thick (T)	L2	S1	S2	A1	A2	A3	A4
ANC808	1.000	.675	.188	.250	.312	.577	25°	12°	0°	20°
ANC809	1.000	.675	.250	.250	.312	.577	25°	12°	0°	20°
ANC387	1.000	.700	.188	.250	.400	.675	22°	12°	7°	22°
ANC383	1.000	.775	.188	.250	.475	.675	22°	12°	7°	22°
ANC845	1.000	.788	.200	.250	.485	.687	22°	12°	7°	22°
ANC813	1.000	.875	.188	.250	.500	.750	26°	12°	12°	26°
ANC825	1.250	.775	.188	.250	.375	.675	20.5°	12°	6°	20.5°
ANC843	1.933	1.20	.318	.967	.734	.834	21°	8°	7°	26°

Wing – right hand



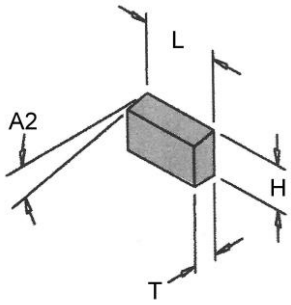
Part Number	Dimensions (inches)						
	Main Form				Angles		
	Length (L)	H	Thick (T)	S	A1	A2	A3
ANC819	.560	.642	.188	.380	25°	12°	6°
ANC810	.560	.642	.250	.380	25°	12°	6°
ANC815	.687	.642	.188	.320	25°	12°	6°

Wing – left hand



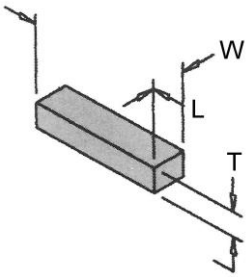
Part Number	Dimensions (inches)						
	Main Form				Angles		
	Length (L)	H	Thick (T)	S	A1	A2	A3
ANC501	.400	.500	.188	.310	25°	12°	0°
ANC820	.560	.642	.188	.380	25°	12°	6°
ANC811	.560	.642	.250	.380	25°	12°	6°
ANC502	.675	.500	.188	.185	25°	12°	0°
ANC816	.687	.642	.188	.320	25°	12°	6°
ANC818	.687	.642	.250	.320	25°	12°	6°
ANC831	.750	.687	.188	.400	21°	12°	0°
ANC503	.875	.500	.188	.090	25°	12°	0°
ANC504	.875	.500	.250	.090	25°	10°	0°
ANC776	.900	.775	.188	.450	20°	0°	0°
ANC777	.900	.775	.250	.450	20°	0°	0°
ANC495	1.000	.625	.125	.050	30°	0°	0°
ANC496	1.000	.625	.156	.050	30°	0°	0°
ANC497	1.000	.625	.188	.050	30°	0°	0°
ANC384	1.000	.675	.188	.250	21.5°	12°	0°
ANC826	1.000	.675	.188	.312	20.5°	12°	0°
ANC385	1.000	.675	.250	.250	21.5°	12°	0°
ANC827	1.000	.675	.250	.312	20.5°	12°	0°
ANC807	1.188	.577	.188	.125	20°	12°	0°
ANC419	1.250	.675	.188	.188	21°	12°	0°
ANC420	1.250	.665	.250	.188	21°	12°	0°

Gage blank – with angle



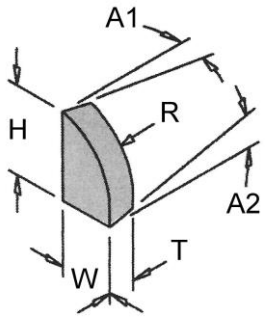
Part Number	Dimensions (inches)			
	Main Form			Angles
	Length (L)	Height (H)	Thick (T)	A2
ANC814	.273	.525	.147	60°
ANC410	.375	.750	.250	60°
ANC341	.500	.375	.125	12°
ANC340	.500	.375	.188	12°
ANC239	.625	.375	.125	12°
ANC823	.625	.375	.156	12°
ANC238	.625	.375	.188	12°
ANC345	.625	.375	.250	12°
ANC805	.750	.500	.188	11°
ANC802	1.000	.500	.188	11°
ANC828	1.000	.500	.250	11°

Gage blank – no angle



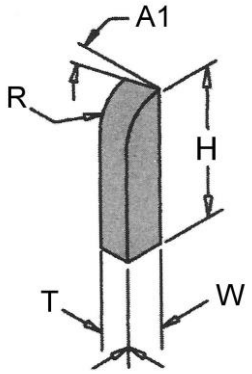
Part Number	Dimensions (inches)		
	Length (L)	Width (W)	Thick (T)
TWL0010	.312	.250	.125
TWL0004	.750	.500	.125
ANC480	1.000	.250	.125
ANC481	1.000	.250	.188
TWL0014	1.000	.375	.188
TWL0015	1.000	.625	.217
ANC485	2.250	.143	.195
ANC487	2.650	.250	.188

Gage blank – radiused, left hand or neutral



Part Number	Dimensions (inches)					
	Main Form			Angles		Radius
	Height (H)	Width (W)	Thick (T)	A1	A2	R
ANC178	.625	.375	.125	12°	0°	.250
ANC179	.625	.375	.188	12°	0°	.250
ANC833	.625	.375	.125	12°	12°	.500
ANC822	.625	.375	.188	12°	12°	.500
ANC342	1.000	.250	.125	0°	0°	.250
ANC343	1.000	.250	.188	0°	0°	.250
ANC344	1.000	.250	.250	0°	0°	.250

Gage blank – radiused, right hand

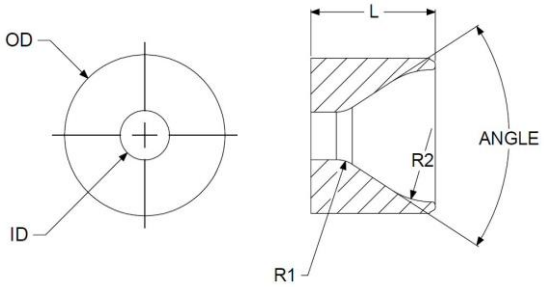


Part Number	Dimensions (inches)				
	Main Form			Angles	Radius
	Height (H)	Width (W)	Thick (T)	A1	R
ANC821	1.000	.250	.188	12°	.500

SYNERGY

Synergy Carbide produces and stock a wide selection of industry-standard, non-shrouded and threaded fluid nozzles. Manufactured from a proven, wear resistant grade of tungsten carbide, the nozzles create a high velocity flow of drilling fluid to clean the bit teeth and bottom of the hole, allowing for faster evacuation of material. We also have in-house design capability to produce made-to-order nozzles.

Standard non-shrouded fluid nozzles



Part Number	Orifice Size (in inches)	Dimensions (inches)					
		Main Form					
		Outer Diameter (OD)	Body Length (L)	Inner Diameter (ID)	Small Radius (R1)	Large Radius (R2)	Inside Angle (°)
NOZ674500	-8 (8/32)	.674	.500	.250	.218	.406	33
	-9 (9/32)	.674	.500	.281	.218	.406	33
	-10 (10/32)	.674	.500	.312	.218	.406	25
	-11 (11/32)	.674	.500	.344	.218	.406	23
	-12 (12/32)	.674	.500	.375	.218	.516	22
	-13 (13/32)	.674	.500	.406	.218	.516	-
	-14 (14/32)	.674	.500	.437	.218	.625	-
	-15 (15/32)	.674	.500	.469	.218	.750	-
	-16 (16/32)	.674	.500	.500	-	-	-
NOZ720630	-8 (8/32)	.720	.630	.250	.250	.630	30
	-9 (9/32)	.720	.630	.281	.250	.630	24
	-10 (10/32)	.720	.630	.312	.250	.630	20
	-11 (11/32)	.720	.630	.343	.250	.630	17
	-12 (12/32)	.720	.630	.375	.250	.630	14
	-13 (13/32)	.720	.630	.406	.250	.630	11
	-14 (14/32)	.720	.630	.438	.250	.630	9
	-15 (15/32)	.720	.630	.469	.250	.630	7
	-16 (16/32)	.720	.630	.500	.250	.630	5
NOZ800685 Also known as: B-Style NJJR-Style	-6 (6/32)	.800	.685	.188	.250	.375	38
	-8 (8/32)	.800	.685	.250	.250	.500	33
	-9 (9/32)	.800	.685	.281	.250	.500	33
	-10 (10/32)	.800	.685	.312	.250	.500	25
	-11 (11/32)	.800	.685	.344	.250	.500	23
	-12 (12/32)	.800	.685	.375	.250	.630	22
	-13 (13/32)	.800	.685	.406	.250	.630	20
	-14 (14/32)	.800	.685	.437	.250	.750	18
	-15 (15/32)	.800	.685	.469	.250	.750	14
	-16 (16/32)	.800	.685	.500	.250	.750	10
	-18 (18/32)	.800	.685	.562	.380	.750	7
NOZ803500 Also known as: NMMR-Style	-13 (13/32)	.803	.500	.406	.250	.406	-
	-15 (15/32)	.803	.500	.469	.125	.406	-
	-16 (16/32)	.803	.500	.500	.125	.406	-
	-18 (18/32)	.803	.500	.562	.125	.406	-

Standard non-shrouded fluid nozzles (continued)

Part Number	Orifice Size (in inches)	Dimensions (inches)					
		Main Form					
		Outer Diameter (OD)	Body Length (L)	Inner Diameter (ID)	Small Radius (R1)	Large Radius (R2)	Inside Angle (°)
NOZ925750 Also known as: F-Style NNNR-Style	-12 (12/32)	.925	.750	.375	.250	.500	35
	-13 (13/32)	.925	.750	.406	.250	.500	35
	-14 (14/32)	.925	.750	.437	.250	.500	35
	-16 (16/32)	.925	.750	.500	.250	.500	-
	-18 (18/32)	.925	.750	.562	.250	.500	-
	-20 (20/32)	.925	.750	.625	.250	.500	-
NOZ1055625 Also known as: NNLR-Style	-8 (8/32)	1.055	.625	.242	.115	.635	-
	-10 (10/32)	1.055	.625	.313	.210	.340	-
	-12 (12/32)	1.055	.625	.375	.210	.375	-
	-14 (14/32)	1.055	.625	.437	.210	.425	-
	-16 (16/32)	1.055	.625	.500	.210	.498	-
	-18 (18/32)	1.055	.625	.562	.189	.625	-
NOZ1171812 Also known as: H-Style NQQR-Style	-10 (10/32)	1.171	.812	.312	.250	.440	38
	-11 (11/32)	1.171	.812	.344	.250	.500	38
	-12 (12/32)	1.171	.812	.375	.250	.500	37
	-13 (13/32)	1.171	.812	.406	.250	.500	37
	-14 (14/32)	1.171	.812	.437	.250	.500	35
	-16 (16/32)	1.171	.812	.500	.250	.500	34
	-18 (18/32)	1.171	.812	.562	.250	.500	35
	-20 (20/32)	1.171	.812	.625	.250	.630	35
	-22 (22/32)	1.171	.812	.687	.250	.630	25
	-24 (24/32)	1.171	.812	.750	.250	.630	20
NOZ12971060 Also known as: K-Style NUUR-Style	-13 (13/32)	1.297	1.060	.406	.250	.625	33
	-14 (14/32)	1.297	1.060	.438	.375	.750	33
	-15 (15/32)	1.297	1.060	.469	.375	.750	33
	-16 (16/32)	1.297	1.060	.500	.375	.750	33
	-18 (18/32)	1.297	1.060	.562	.375	.750	31
	-20 (20/32)	1.297	1.060	.625	.375	.750	28
	-22 (22/32)	1.297	1.060	.688	.375	.750	25
	-24 (24/32)	1.297	1.060	.750	.375	.750	26
	-28 (28/32)	1.297	1.060	.875	.375	.750	16

Synergy Carbide produces a variety of standard threaded nozzles in a virgin tungsten carbide grade specifically engineered with the wear and corrosion resistance required for drilling applications. See example pictures below.

Our line includes **Series 44, 60, and 65** threaded nozzles for PDC bits in a wide array of orifice sizes and installation configurations, including castle top, internal hex top, and external hex top. We can also produce nozzles to your specific design or print. Call for pricing and availability on our impressive offering of threaded nozzles.

Standard threaded fluid nozzles

SYNERGY

HARDFACING PRODUCTS
composite rod and grit for cutting and wear applications

CrushCut™ Rod

CrushCut™ Grit

CrushCut Rod Part Number	CrushCut Grit Part Number	Particle Size (in.)
CCROD70-1018M	CC10-18	10-18 MESH
CCROD70-18116	CC18-116	1/8 X 1/16
CCROD70-31618	CC316-18	3/16 X 1/8
CCROD70-316316	CC316-316	3/16 X 3/16
CCROD65-14316	CC14-316	1/4 X 3/16
CCROD65-1414	CC14-14	1/4 X 1/4
CCROD65-51614	CC516-14	5/16 X 1/4
CCROD65-516516	CC516-516	5/16 X 5/16
CCROD65-38516	CC38-516	3/8 x 5/16
CCROD65-1238	CC12-38	1/2 x 3/8

CrushCut™ composite rod is cast in a nickel / silver matrix with a tensile strength of up to 100,000 PSI and is offered without flux in one-pound increments.

A 65/35 ratio of carbide to matrix is used for cutting applications, and for wear applications a 70/30 ratio is used.

CrushCut™ premium grit is available in industry-standard sizes from 1018 mesh through 3/8". Sintered virgin tungsten carbide material is crushed and screened to ensure unmatched consistency.

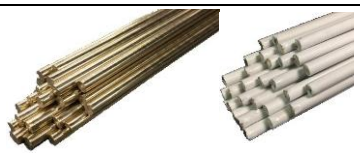
Synergy Carbide offers Type B high-temperature flux, in powder and paste forms, tailored for use with nickel-silver alloys. Non-corrosive, washes away with water, and cleans contaminants on the brazing surface.

Our tinning rod comes bare or fluxed in standard sizes. Made from the same durable nickel-silver alloy used on all our composite rod products, from AWS and ASME class RBCuZn-D.

Flux
High-temperature flux for nickel-silver alloys (RBCuZn)

Part Number	Form	Weight (lbs.)
FLUX43860	Powder	1
FLUX43001	Paste	1

Tinning Rod
Nickel-silver alloy for composite rod



Part Number	Flux	Dia. (in.)	Length (in.)
TROD1/8		1/8	36
TROD1/8C	✓	1/8	36
TROD3/16		3/16	36
TROD3/16C	✓	3/16	36

We have a lifelong respect for the sacrifices our nation's military and first responders make to keep our country safe and free. It is the mission of AmeriServ Supply to support these heroes by donating a portion of our profits to charities benefiting these elite groups.

We take pride in making contributions to organizations like the Wounded Warrior Project, the Fisher House Foundation, and the Gary Sinise Foundation. Every dollar we earn means we're helping improve the lives of these amazing people. We sincerely appreciate you joining us in this effort.