



Relationships between the Diamond Trading Company (DTC) round aperture Diamond Sieve (DS) plates.

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Introduction

The relationships between the various round aperture DTC, formerly Central Selling Organisation (CSO) diamond sieves have been an enigma for many years and despite many enquiries and efforts, sensible mathematical relationships could not be established for the relationship(s) between the diameters of the apertures of the round DTC diamond sieve plates.

Results

Separate replies from two long-serving CSO/DTC members alleged that these apertures were based on the sizes of buck and/or bird shot pellets. This allegation was investigated and it was found that out of the 19 DTC sieve plates often used, i.e. 23, 21, 19, 17, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2 and 1 there were 13 double matches with various shot sizes to within 0.002 inches and 4 double matches to within 0.004 inches. The DTC permitted tolerance for DS plates is +/- 0.002 inches.

Two of the larger buck shot pellet sizes, #4 and 'F', could have been equivalent to the 18 and 16 DTC DS which currently do not exist. Another two buck shot sizes, #000 and #2, could also have been equivalent to the 22 and 20 DTC DS but these sieves also do not currently exist. The #1 DTC DS has an equivalent to what is termed #13 Pest Shot or "Dust". There are no buck nor bird shot equivalents for the apertures of the 23 and 5 DTC DS plates. There are a further four buck shot, #0000, #00 #0, 'T', and one bird shot, 'B', pellet sizes which have no DTC DS equivalents.

The 21 DTC DS does not match any buck or bird shot sizes. The #1 and #2 buck shot sizes fall between the 21 and 19 DTC DS but the 20 DTC DS does not exist. Despite many further enquiries it has not been possible to discover the reason(s) for the current non-existence of the 22, 20, 18 and 16 DTC DS and also if they ever existed.

The correlation between buck and bird shot sizes and the DTC DS was enhanced by a statement that because buck/bird shot sizes had been standardized for many years in the United Kingdom, and were then readily available, manufacture of DS plates with consistent apertures could be achieved using these pellets.

Table 1 illustrates the various 'matches' which are colour-coded with explanatory 'Notes' below the table.

Table 1										
DTC	DTC	DTC	DTC	DTC	BUCK or	DTC	BUCK or	BUCK or	BUCK or	Low er Critical
DIAMOND	"Missing"	DIAMOND	DIAMOND	"Missing"	BIRD	DIAMOND	BIRD	BIRD	BIRD	Stone Size
SIEVE	DIAMOND	SIEVE	SIEVE	DIAMOND	Shot	SIEVE	Shot	Shot	Shot	per Diamond
CLASS	SIEVE	ROUND	ROUND	SIEVE	Pellet	Aperture	Pellet	Pellet	Pellet	Sieve Class
	CLASSES	APERTURE	APERTURE	ROUND	diameter	permitted	diameter	Label	Type	southern African
		as per tables	actual	APERTURE	permitted	tolerances	compiled			Primary
		normal use	as per tables	Interpolated	tolerances	+ / --	from Internet			Kimberlites
		mm	inches	inches	inches	inches	inches			carats/ stone
+23		10.312	0.406		0.002					8.0360
					0.002		0.380	0000	buck shot #	
					0.002		0.370	0001/2	buck shot #	
	? +22			0.356	0.002	0.002	0.360	000	buck shot #	5.4506
					0.002		0.340	001/2	buck shot #	
					0.002		0.330	00	buck shot #	
					0.002		0.320	0	buck shot #	
+21		7.925	0.312		0.002	0.002	0.310	1 1/2	buck shot#	3.6910
					0.002		0.300	1	buck shot #	
					0.002		0.290	2 1/2	buck shot #	
	? +20		0.279	0.279	0.002		0.270	2	buck shot #	2.6681
					0.002		0.260	3 1/2	buck shot #	
+19		6.350	0.250		0.002	0.002	0.250	3	buck shot #	1.9180
	? +18		0.238	0.238	0.002	0.240	0.240	4	buck shot #	1.6591
+17		5.740	0.226		0.002	0.228	0.230	FF	buck shot #	1.4230
	? +16		0.219	0.219			0.220	F	buck shot #	1.3104
+15		5.410	0.213		0.001	0.212	0.210	TT	buck shot #	1.1950
							0.200	T	Bird shot #	
+14		4.750	0.187		0.001	0.188	0.190	BBB	Bird shot #	0.8184
+13		4.521	0.178		0.001	0.179	0.180	BB	Bird shot #	0.7030
							0.170	B	Bird shot #	
+12		4.089	0.161		0.001	0.160	0.160	1	Bird shot #	0.5230
							0.150	2	Bird shot #	
+11		3.454	0.136		0.001	0.137	0.140	3	Bird shot #	0.3170
+10		3.277	0.129		0.001	0.130	0.130	4	Bird shot #	0.2741
							0.125	4 1/2	Bird Shot #	
							0.120	5	Bird shot #	
+ 9		2.845	0.112		0.001	0.111	0.110	6	Bird shot #	0.1790
+ 8		2.515	0.099		0.0005	0.100	0.099	6 1/2	Bird shot #	0.1257
								7	Bird shot #	
+ 7		2.464	0.097		0.0005	0.096	0.095	7 1/2	Bird shot #	0.1165
							0.090	8	Bird shot #	
+ 6		2.159	0.085		0.0005	0.084	0.085	8 1/2	Bird shot #	0.0792
							0.080	9	Bird shot #	
+ 5		1.829	0.072							0.0485
+ 4		1.753	0.069		0.0005	0.070	0.070	10	Bird shot #	0.0443
+ 3		1.473	0.058		0.0005	0.059	0.060	11	Bird shot #	0.0256
+ 2		1.321	0.052		0.0005	0.051	0.050	12	Bird shot #	0.0186
+ 1		1.092	0.043		0.0005	0.044	0.040	13	Pest Shot#	0.0106
Totals		19	23				36			
Notes		19	Actual DTC Diamond Sieves							
		23	Possible DTC Diamond Sieves includes 'missing' DS 22, 20, 18, 16							
		37	Shot Sizes = 16 Buck, 20 Bird & 1 Pest							
		13	double matches to within 0.002 inches							
		4	possible more double matches to within 0.004 inches							
		2	possible more matches to 0.004 ins but DS does not exist, i.e. Missing DS 18 & 16							
		10	Larger Buck Shot sizes exist with no DS equivalent, but could be 22 or 20 DS							
		7	Bird Shot sizes exist with no DS equivalent,							
		2	DS +23 & +05 match no shot sizes							

Figures 1 and 2 show the correlations between the buck and bird shot sizes and the DTC Diamond Sieves.

Figure 1 shows the buck and bird shot size labels on the horizontal axis.

Figure 1

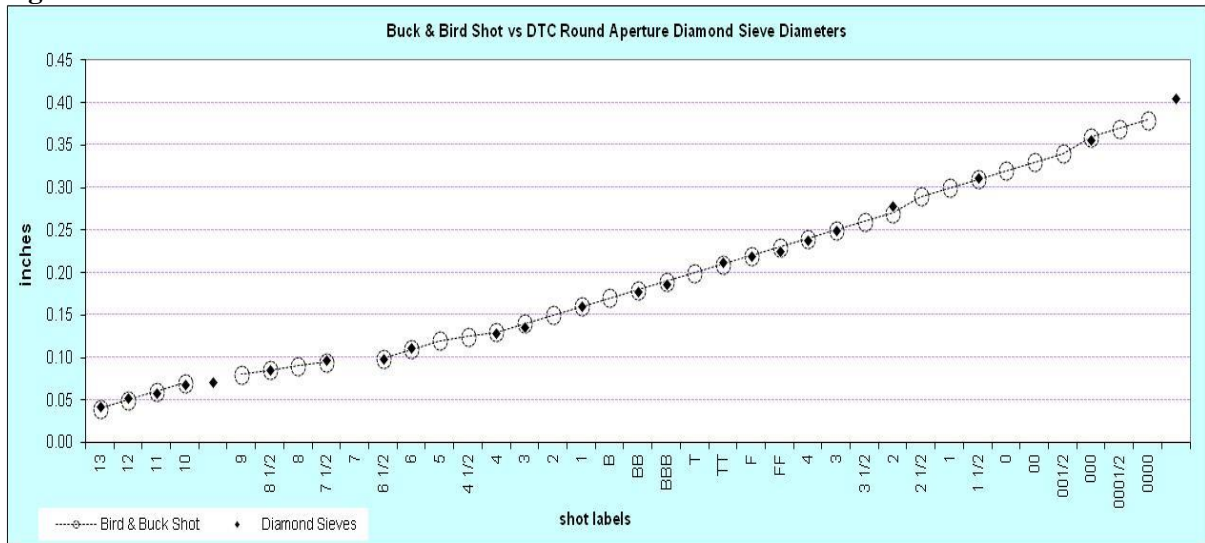
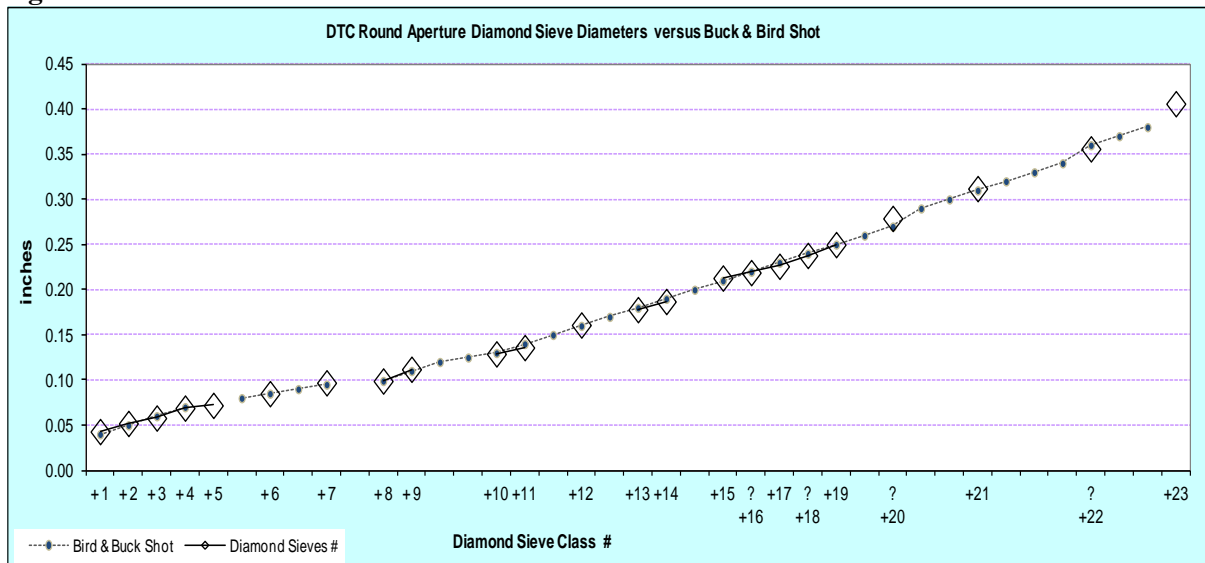


Figure 2 displays the DTC Diamond Sieve class numbers on the horizontal axis.

Figure 2



Inspection of Table 1 with Figures 1 and 2, on the balance of probabilities, substantiate, although do not ‘prove’, the allegation that the round apertures of the DTC Diamond Sieves were based on buck and bird shot pellets sizes.

References

DTC Reference Sheets

Endecotts: http://www.endecotts.com/dltmp/www/56607c62-8044-4b33-ba08-2482bc282b86-400f14323e75/brochure_endecotts_general_en.pdf

Numerous from Wikipedia particularly

[https://en.wikipedia.org/wiki/Shot_\(pellet\)#Comparison_chart](https://en.wikipedia.org/wiki/Shot_(pellet)#Comparison_chart)