

General Information

Contents

As all engineers would agree, the selection of the right tool is paramount for the efficient machining of the component and for achieving the required tool life. This fact, coupled with the advancement in materials used in aerospace and related industries, has led to the development of the A777, a heavy duty drill in high speed cobalt, with a split point geometry.

High temperatures are the major cause of unsatisfactory tool life, as well as placing limitations on cutting speeds. The A777 is able to withstand the high temperatures generated when drilling into high tensile tough materials, so it is a particularly versatile tool, recommended for a wide range of materials, from high strength steels to Cast Iron and Nickel Alloys.

The A777 can be used in hand held and machine applications in the aerospace industry and for general purpose drilling.

To complement the A777, Dormer Tools has introduced two new ranges of aircraft extension drills, each with an overall length of six inches (150mm) for drilling Aluminium alloyed laminates and air frames, where access to the work piece is difficult. Both ranges have all the advantages that a split point gives and are available in a choice of 135° point angle (A243) and 118° point angle (A244).

A777

HSCo Jobber Drill,
Heavy Duty, Right Hand.
DIN 338 RN/BS 328/ISO 235.

A243

HSS Straight Shank Aircraft
Extension Drill with 135°
split point - 6" (150mm)
Overall Length.
ANSI.

A244

HSS Straight Shank Aircraft
Extension Drill with 118°
split point - 6" (150mm)
Overall Length.
ANSI.

Features & Benefits

A777

Features

Flutes

Web Design

Tool Material

Marking

Finish

Web Taper

Helix

Split Point



Benefits

Ground finish for easier chip flow.

Thick Web construction for tool rigidity.

Cobalt High Speed Steel. Improved tool life and resists tool softening from heat generation during drilling.

For easy identification.

Bronze for Cobalt identification and prevention of metal to metal contact.

Tapered web increasing towards flute run out to provide added strength.

Helix optimised to suit AMG's and swarf evacuation requirements.

Reduced chisel edge width, thrust forces, easy penetration, precise positioning, improved hole size, hole finish and straightness.

A243/A244

Features

Flutes

Web Design

Tool Material

Marking

Finish

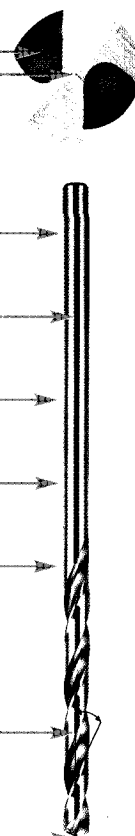
Long Plain Shank

Flute Length

Web Taper

Helix

Split Point



Benefits

Ground finish for easier chip flow.

Standard web design provides open chip space availability.

High quality high speed steel for wear prevention.

For easy identification.

Bright finish to suit recommended AMG's.

Enables reach into difficult to access areas.

Jobber length flutes for tool rigidity on long reaching applications.

Heavy web taper provides increased tool rigidity.

Standard helix providing adequate swarf removal.

Hand held application usage, reduced chisel edge, easier penetration, reduced thrust forces, improved hole quality, hole finish and hole straightness.

AMG Chart

■ Excellent for application

● Good for application

Example: 25 = Mid peripheral speed metres/minute $\pm$ 10%

F = Feed Range - see drill feed chart

	Application Material Groups (AMG)	Hardness HB	Tensile Strength N/mm ²	Normal Chip Form	A777	A243	A244
1. Steel	1.1 Magnetic soft steel	<120	<400	extra long			
	1.2 Structural steel / Case carburizing steel	<200	<700	middle/long			
	1.3 Plain Carbon steel	<250	<850	long		●25F	●25F
	1.4 Alloy Steel	<250	<850	long	●24F	●20F	●20F
	1.5 Alloy Steel	>250	>850	long	■17E	■13E	■13E
	Hardened and tempered steel	<350	<1200				
	1.6 Alloy Steel	>350	>1200	long	■10D	■9D	■9D
	Hardened and tempered steel		<1620				
	1.7 Alloy steel Hardened	49-55 HRC	>1620	long			
2. Stainless Steel	2.1 Free machining Stainless Steel	<250	<850	middle	●22E	●15E	●15E
	2.2 Austenitic	<250	<850	long		■8G	■8G
	2.3 Ferritic, Austenitic	<300	<1000	long		■9C	■9C
	Ferritic, Martensitic						
3. Cast Iron	3.1 Lamellar Graphite	<150	<700	extra short	●35H	●30I	●30I
	3.2 Lamellar Graphite	>150	>500	extra short	●28D	●24F	●24F
		<300	<1000				
	3.3 Nodular Graphite	<200	<700	middle/short	●22E	●20E	●20E
	Malleable Cast Iron						
4. Titanium	4.1 Titanium, unalloyed	<200	<700	extra long	■28F	■23F	■23F
	4.2 Titanium, alloyed	<270	<900	middle/short	■20D	■12D	■12D
	4.3 Titanium, alloyed	>270	>900	middle/short	■11C	■6B	■6B
		<350	<1250				
5. Nickel	5.1 Nickel, unalloyed	<150	<500	extra long		■10G	■10G
	5.2 Nickel, alloyed	<270	<900	long	■7E	●6E	●6E
	5.3 Nickel, alloyed	>270	>900	long		●3A	●3A
		<350	<1200				
6. Copper	6.1 Copper	<100	<350	extra long			
	6.2 β -Brass, Bronze	<200	<700	middle/short			
	6.3 α Brass	<200	<700	long		●27H	●27H
	6.4 High Strength Bronze	<470	<1500	short		■16G	■16G
7. Aluminium Magnesium	7.1 Al, Mg, unalloyed	<100	<350	extra long			
	7.2 Al, alloyed, Si<0.5%	<150	<500	middle			
	7.3 Al, alloyed, Si<0.5%	<120	<400	middle/short			
	<10%						
	7.4 Al alloyed, Si>10%	<120	<400	short		■24F	■24F
8. Synthetic Materials	8.1 Thermoplastics	-	-	extra long			
	8.2 Thermosetting plastics	-	-	short			
	8.3 Reinforced plastic materials	-	-	extra short			
9. Hard Materials	9.1 Cermets (metal-ceramics)	<550	<1700	extra short	●6C	●3B	●3B

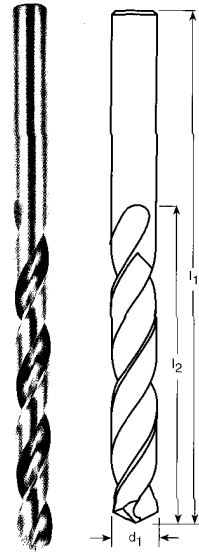
Drill Feed Chart

Feed Code	Diameter / Tool No.										
	1mm	No. 40 2mm	No. 30 3mm	No. 21 No. 20 4mm	No. 11 No. 10 5mm	6mm	8mm	10mm	12mm	15mm	16mm
A	0.012	0.023	0.029	0.032	0.036	0.042	0.054	0.062	0.069	0.082	0.086
B	0.014	0.028	0.037	0.041	0.046	0.053	0.067	0.080	0.090	0.103	0.108
C	0.015	0.032	0.044	0.050	0.056	0.064	0.080	0.098	0.110	0.125	0.130
D	0.016	0.038	0.053	0.060	0.068	0.078	0.098	0.119	0.130	0.149	0.155
E	0.017	0.043	0.062	0.071	0.080	0.092	0.115	0.140	0.150	0.173	0.180
F	0.018	0.050	0.073	0.084	0.095	0.109	0.138	0.165	0.178	0.202	0.210
G	0.019	0.056	0.084	0.096	0.109	0.126	0.160	0.190	0.205	0.231	0.240
H	0.020	0.066	0.102	0.116	0.130	0.150	0.190	0.228	0.243	0.271	0.280
I	0.021	0.076	0.119	0.134	0.150	0.173	0.220	0.265	0.280	0.310	0.320
J	0.024	0.084	0.135	0.152	0.170	0.197	0.250	0.298	0.315	0.349	0.360

FEED IN MM / REV $\pm$ 25%

HSCo Jobber Drill, Heavy Duty, Right Hand DIN 338 RN/BS 328/ISO 235

Flute Geometry	Standard helix, Thick Web, Right Hand Spiral
Point Geometry	118° Conical point — sizes up to and including 0.95mm 135° 4 Facet point — 1.00 to 1.40 mm inclusive 135° split point — sizes 1.50mm & above (Split point geometry to NAS 907 Aerospace Specification — Type P3 point)
Surface Treatment	Bronze
Application	For use when greater heat is generated during drilling, eg on higher tensile tougher materials and in particular, in the Aerospace industry.



d ₁ Øh8 inch/"	d ₁ Øh8 mm	l ₂ mm	l ₁ mm	d ₁ Øh8 inch/"	d ₁ Øh8 mm	l ₂ mm	l ₁ mm	d ₁ Øh8 inch/"	d ₁ Øh8 mm	l ₂ mm	l ₁ mm
	0.30	3	19		4.10	43	75		8.20	75	117
	0.35	4	19		4.20	43	75		8.30	75	117
	0.40	5	20		4.30	47	80	21/64	8.33	75	117
	0.45	5	20	11/64	4.37	47	80		8.40	75	117
	0.50	6	22		4.40	47	80		8.50	75	117
	0.55	7	24		4.50	47	80		8.60	81	125
	0.60	7	24		4.60	47	80		8.70	81	125
	0.65	8	26		4.70	47	80	11/32	8.73	81	125
	0.70	9	28	3/16	4.76	52	86		8.80	81	125
	0.80	10	30		4.80	52	86		8.90	81	125
	0.90	11	32		4.90	52	86		9.00	81	125
	0.95	11	32		5.00	52	86		9.10	81	125
	1.00	12	34		5.10	52	86	23/64	9.13	81	125
	1.10	14	36	13/64	5.16	52	86		9.20	81	125
	1.20	16	38		5.20	52	86		9.30	81	125
	1.30	16	38		5.30	52	86		9.40	81	125
	1.40	18	40		5.40	57	93		9.50	81	125
	1.50	18	40		5.50	57	93	3/8	9.53	87	133
1/16	1.59	20	43	7/32	5.56	57	93		9.60	87	133
	1.60	20	43		5.60	57	93		9.70	87	133
	1.70	20	43		5.70	57	93		9.80	87	133
	1.80	22	46		5.80	57	93		9.90	87	133
	1.90	22	46		5.90	57	93	25/64	9.92	87	133
5/64	1.98	24	49	15/64	5.95	57	93		10.00	87	133
	2.00	24	49		6.00	57	93		10.10	87	133
	2.10	24	49		6.10	63	101		10.20	87	133
	2.20	27	53		6.20	63	101	13/32	10.32	87	133
	2.30	27	53		6.30	63	101		10.50	87	133
3/32	2.38	30	57	1/4	6.35	63	101	27/64	10.72	94	142
	2.40	30	57		6.40	63	101		10.80	94	142
	2.50	30	57		6.50	63	101		11.00	94	142
	2.60	30	57		6.60	63	101	7/16	11.11	94	142
	2.70	33	61		6.70	63	101		11.20	94	142
7/64	2.78	33	61	17/64	6.75	69	109		11.50	94	142
	2.80	33	61		6.80	69	109	29/64	11.51	94	142
	2.90	33	61		6.90	69	109		11.80	94	142
	3.00	33	61		7.00	69	109	15/32	11.91	101	151
	3.10	36	65	9/32	7.10	69	109		12.00	101	151
1/8	3.18	36	65		7.14	69	109		12.20	101	151
	3.20	36	65		7.20	69	109	31/64	12.30	101	151
	3.30	36	65		7.30	69	109		12.50	101	151
	3.40	39	70		7.40	69	109	1/2	12.70	101	151
	3.50	39	70	19/64	7.50	69	109		12.80	101	151
9/64	3.57	39	70		7.54	75	117		12.80	101	151
	3.60	39	70		7.60	75	117		13.00	101	151
	3.70	39	70		7.70	75	117		13.50	108	160
	3.80	43	75		7.80	75	117		14.00	108	160
	3.80	43	75		7.90	75	117		14.50	114	169
	3.90	43	75	5/16	7.94	75	117		15.00	114	169
5/32	3.97	43	75		8.00	75	117		15.50	120	178
	4.00	43	75		8.10	75	117		16.00	120	178

HSS

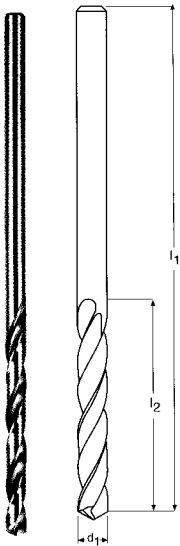
A243

HSS Straight Shank Aircraft Extension Drill with 135° split point —
6" (150mm) overall length ANSI

Flute Geometry	Standard Helix, Heavy Web Taper, Right Hand Spiral
Point Geometry	135° split point (Split point geometry to NAS 907 Aerospace Specification — Type P3 point)
Surface Treatment	Bright
Application	General purpose long shank drill. Particularly used in the Aerospace industry where reach is required into difficult to access areas on hand held applications

d_1 Øh8 inch/"	d_1 Øh8 No.	l_2	l_1
3/32"		1 1/4"	6"
	40	1 3/8"	6"
1/8"		1 5/8"	6"
	30	1 5/8"	6"
5/32"		2"	6"
	21	2 1/8"	6"
	20	2 1/8"	6"
3/16"		2 5/16"	6"
	11	2 5/16"	6"
	10	2 7/16"	6"
1/4"		2 3/4"	6"

Available in other diameters
on special request



* The flute and overall lengths of these tools exclude the point end dimensions.

HSS

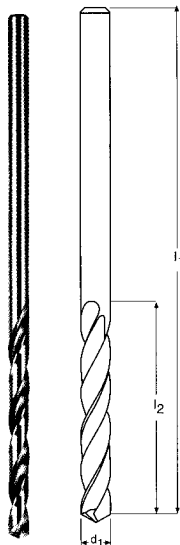
A244

HSS Straight Shank Aircraft Extension Drill with 118° split point —
6" (150mm) overall length ANSI

Flute Geometry	Standard Helix, Heavy Web Taper, Right Hand Spiral
Point Geometry	118° split point. (Split point geometry to NAS 907 Aerospace Specification — Type P5 point)
Surface Treatment	Bright
Application	General purpose long shank drill. Particularly used in the Aerospace industry where reach is required into difficult to access areas on hand held applications.

d_1 Øh8 inch/"	l_2	l_1
1/8"	1 5/8"	6"
5/32"	2"	6"
3/16"	2 5/16"	6"
1/4"	2 3/4"	6"

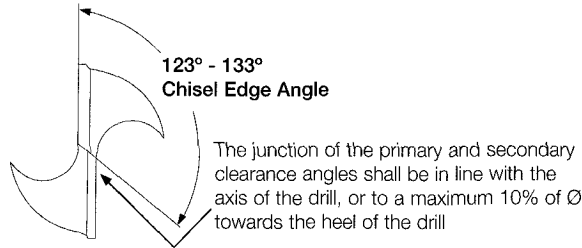
Available in other diameters
on special request



* The flute and overall lengths of these tools exclude the point end dimensions.

Point Regrinding Information A777

4 Facet Geometry



Sizes Below 1.00 have a 118° Conical Point

Sizes 1.00 - 1.40 Incl have a 135° 4 Facet Point Geometry

Point Angle
1.50 & Above
135° +/- 3°

Primary Lip Clearance Angle

1.00	20° +/- 1°
1.10 - 1.30 Incl	19° +/- 1°
1.40	18° +/- 1°

Secondary Lip Clearance Angle

1.00	28° +/- 1°
1.10 - 1.30 Incl	27° +/- 1°
1.40	26° +/- 1°

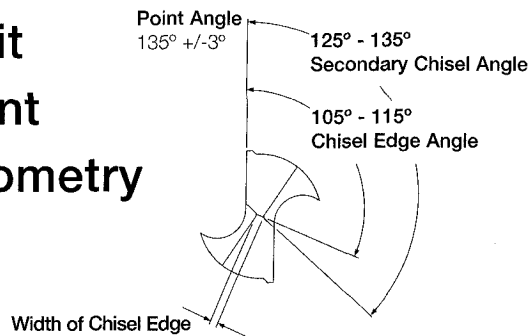
Relative Lip Height Tolerance (Max T.I.V.)

1.00	0.01
1.10 - 1.40 Incl.	0.02

Chisel Edge Centrality

Tolerance (Max T.I.V.) 0.02

Split Point Geometry



Thinning Rake Angle
3° - 8° Positive to Drill Axis

Lip Clearance Angle
Up to 3.00 Incl 16° +/- 3°
Over 3.00 - 6.00 Incl 14° +/- 3°
Over 6.00 - 10.00 Incl 12° +/- 2°
Over 10.00 10° +/- 2°

Secondary Clearance Angle to Drill Axis
35° - 45°

Width of Chisel Edge

Up to 3.00 Incl	0.05 - 0.13
Over 3.00 - 6.00 Incl	0.05 - 0.15
Over 6.00 - 10.00 Incl	0.08 - 0.18
Over 10.00	0.08 - 0.23

Chisel Edge Centrality Tolerance (Max T.I.V.)

Up to 1.99 Incl	0.02
2.00 - 2.99 Incl	0.04
3.00	0.05
Over 3.00 - 6.00 Incl	0.08
Over 6.00 - 10.00 Incl	0.10
Over 10.00 - 13.00 Incl	0.12
Over 13.00	0.08

Relative Lip Height Tolerance (Max T.I.V.)

Up to 2.20 - Incl	0.02	Over 10.00 - 11.80 Incl	0.08
Over 2.20 - 3.60 Incl	0.03	Over 11.80 - 13.60 Incl	0.09
Over 3.60 - 5.05 Incl	0.04	Over 13.60 - 15.40 Incl	0.10
Over 5.05 - 6.65 Incl	0.05	Over 15.40	0.11
Over 6.65 - 8.30 Incl	0.06		
Over 8.30 - 10.00 Incl	0.07		

A243

Point Angle
135° +/- 5°

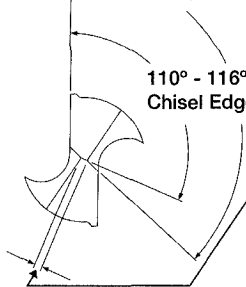
127° - 132°
Secondary Chisel Angle

110° - 116°
Chisel Edge Angle

Chisel Edge Centrality Tolerance (Max T.I.V.)
0.05

Secondary Clearance Angle to Drill Axis 35° - 45°

Lip Clearance Angle
3/32" 16° +/- 3°
No.40 - 1/4" 12° +/- 2°



Thinning Rake Angle
4° - 7° Positive to Drill Axis

Relative Lip Height Tolerance (Max T.I.V.) 0.05

A244

Point Angle
118° +/- 5°

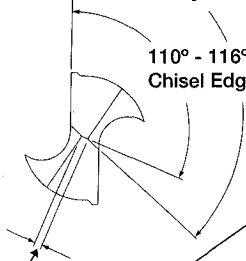
127° - 132°
Secondary Chisel Angle

110° - 116°
Chisel Edge Angle

Chisel Edge Centrality Tolerance (Max T.I.V.)
0.05

Secondary Clearance Angle to Drill Axis 35° - 45°

Lip Clearance Angle
All sizes 12° +/- 2°



Thinning Rake Angle
4° - 7° Positive to Drill Axis

Relative Lip Height Tolerance (Max T.I.V.) 0.05