

Visual Index - Drills

Feed Rate Chart - Drills

Alpha Code	Feed in Inches per Revolution (IPR) ± 25%													Ø Diameter		
	1mm/ 1/32"	2mm/ 3/32"	3mm/ 1/8"	4mm/ 5/32"	5mm/ 3/16"	6mm/ 1/4"	8mm/ 5/16"	10mm/ 3/8"	12mm/ 1/2"	15mm/ 9/16"	16mm/ 5/8"	20mm/ 3/4"	25mm/ 1"	30mm/ 1.1/8"	40mm/ 1.5/8"	50mm/ 2"
A	0.0004	0.0009	0.0011	0.0013	0.0014	0.0017	0.0021	0.0024	0.0027	0.0032	0.0034	0.0043	0.0049	0.0053	0.0061	0.0069
B	0.0006	0.0011	0.0015	0.0016	0.0018	0.0021	0.0026	0.0031	0.0035	0.0041	0.0043	0.0053	0.0060	0.0065	0.0074	0.0082
C	0.0006	0.0013	0.0017	0.0020	0.0022	0.0025	0.0031	0.0039	0.0043	0.0049	0.0051	0.0063	0.0071	0.0077	0.0087	0.0094
D	0.0006	0.0015	0.0021	0.0024	0.0027	0.0031	0.0039	0.0047	0.0051	0.0059	0.0061	0.0074	0.0083	0.0090	0.0100	0.0108
E	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068	0.0071	0.0085	0.0094	0.0102	0.0112	0.0122
F	0.0007	0.0020	0.0029	0.0033	0.0037	0.0043	0.0054	0.0065	0.0070	0.0080	0.0083	0.0098	0.0108	0.0116	0.0126	0.0135
G	0.0007	0.0022	0.0033	0.0038	0.0043	0.0050	0.0063	0.0075	0.0081	0.0091	0.0094	0.0110	0.0122	0.0130	0.0140	0.0148
H	0.0008	0.0026	0.0040	0.0046	0.0051	0.0059	0.0075	0.0090	0.0096	0.0107	0.0110	0.0126	0.0140	0.0148	0.0157	0.0165
I	0.0008	0.0030	0.0047	0.0053	0.0059	0.0068	0.0087	0.0104	0.0110	0.0122	0.0126	0.0142	0.0157	0.0165	0.0173	0.0181
J	0.0009	0.0033	0.0053	0.0060	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137	0.0142	0.0159	0.0175	0.0183	0.0191	0.0198
K	0.0010	0.0036	0.0059	0.0067	0.0075	0.0087	0.0110	0.0130	0.0138	0.0153	0.0157	0.0177	0.0193	0.0201	0.0209	0.0215
L	0.0011	0.0040	0.0065	0.0073	0.0082	0.0094	0.0120	0.0142	0.0152	0.0165	0.0169	0.0191	0.0207	0.0215	0.0224	0.0231
M	0.0012	0.0043	0.0071	0.0080	0.0089	0.0102	0.0130	0.0154	0.0165	0.0177	0.0181	0.0205	0.0220	0.0228	0.0238	0.0248
N	0.0013	0.0047	0.0077	0.0086	0.0095	0.0110	0.0140	0.0165	0.0179	0.0189	0.0193	0.0219	0.0234	0.0242	0.0253	0.0265
S	0.0003	0.0006	0.0008	0.0010	0.0012	0.0015	0.0020	0.0031	0.0039	0.0048	0.0051	0.0059	0.0070	0.0070	0.0090	
T	0.0006	0.0011	0.0016	0.0020	0.0024	0.0028	0.0035	0.0043	0.0051	0.0063	0.0067	0.0075	0.0080	0.0090	0.0100	
U	0.0010	0.0019	0.0028	0.0031	0.0035	0.0042	0.0055	0.0067	0.0079	0.0088	0.0091	0.0094	0.0110	0.0120	0.0140	
V	0.0015	0.0027	0.0039	0.0045	0.0051	0.0060	0.0079	0.0098	0.0110	0.0122	0.0126	0.0134	0.0160	0.0170	0.0200	
W	0.0019	0.0035	0.0051	0.0059	0.0067	0.0079	0.0102	0.0130	0.0150	0.0165	0.0169	0.0177	0.0190	0.0190	0.0200	
X	0.0022	0.0041	0.0059	0.0071	0.0083	0.0098	0.0130	0.0165	0.0189	0.0210	0.0217	0.0228				
Y	0.0027	0.0049	0.0071	0.0087	0.0102	0.0125	0.0169	0.0217	0.0276	0.0276	0.0276	0.0291				
Z	0.0037	0.0068	0.0098	0.0128	0.0157	0.0210	0.0315	0.0394	0.0433	0.0463	0.0472	0.0472				

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code)
2. Find the closest diameter for your cutting application on the chart to find your IPR

Application Material Groups (AMG)	Hardness HRC	ISO		
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2. Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3. Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG4-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4. Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6Al4V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7Al14V-4Mo, 4911-4967	>28<38	S 3
5. Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286	>28<38	S 3
6. Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 β-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7. Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8. Synthetic Materials	8.1 Thermoplastics	Ultrad, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9. Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10. Graphite	10.1 Standard graphite		---	O





























Visual Index - Drills

Tool Material:	HM	HM	HM	HM	HM	HM	HM	HSS	HSS-E	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E
Standard:	DIN 6539	DIN 6537 K	DIN 6537 K	DIN 338	DIN 6537 L	DIN 6537 L	DORNER	DIN 1897	DIN ANSI	DIN ANSI	DIN 338	DORNER	DIN ANSI	DIN ANSI	DIN ANSI
Depth of Cut:	2.5XD	3XD	3XD	4XD	5XD	5XD	8XD	2.5XD	3XD	3XD	4XD	5XD	6XD	6XD	10XD
Point Style:															
Finish/Coating:															
Shank:		DIN 6535HA	DIN 6535HA		DIN 6535HA	DIN 6535HA	DIN 6535HA					DIN 6535HA			
Flute Form:	N			N					W	W			W	W	W
Direction of Cut:															
Coolant Through:															
Style:	R520	R458	R457	R510	R454	R453	R459	A520	A920	A921	A510	A553	A900	A901	A940
Range:	3.00 - 16.50	3.00 - 20.00	3.00 - 20.00	3.00 - 14.25	3.00 - 20.00	3.00 - 20.00	3.00 - 16.00	3.00 - 13.00	1.00 - 20.00	2.50 - 16.00	3.00 - 14.00	5.00 - 20.00	1.00 - 20.00	1.50 - 16.00	1.00 - 20.00
Page #	38	40	40	44	46	46	50	53	56	56	60	63	65	65	68
1.1	328X	510W	510W	328W	510V	510V	443V	187M	131J	197M	187M	279L	125H	197J	125F
1.2	295X	440W	460W	295W	440V	460V	394V	154M	112J	171M	154M	230L	108H	164J	108F
1.3	295X	360W	440W	295W	360V	440V	361U	131K	105I	174J	131K	197L	85H	144I	72G
1.4	262X	330V	375V	262W	330V	375V	328U	105I	105I	174J	98H	148H	85H	144I	72G
1.5	180X	245V	295V	180V	245V	295V	262U	69G	75E	125G	69F	92F	69E	108G	56C
1.6	148W	164U	213U	148V	164U	213U	180T	36E	62E	98G	36D	49D	52E	85G	39C
1.7	115U	98U	98U	115T	98U	98U									
1.8	98T	82U	82U	98S	82U	82U									
2.1	164W	148U	246V	164V	148U	246V	246V	98I	49F	56F	92G	131G	49E	56E	49C
2.2		131T	115V		131T	115V	115V	52I	23F	30F	46I	62I	23E	30E	23E
2.3		115T	98U		115T	98U	98U	66G	30D	36D	62G	89G	30C	36C	30B
2.4		115T			115T										
3.1	295Y	295W	394W	295X	295W	394W	394W	157M	112L	174L	138K	230K	79J	190I	
3.2	295Y	295W	394W	295X	295W	394W	394W	121K	85L	138L	105J	164J	62J	154I	52I
3.3	213X	230V	262V	213W	230V	262V	262V	98J	85L	138L	92J	148J	62J	112J	52I
3.4	213X	230V	262V	213W	230V	262V	262V	85F	62J	118J	82F	138F	46I	92I	39H
4.1	197W	164U	180V	148V	164U	180V		112I	98G	157I	105G	148G	72E	115G	59E
4.2	148V	131U	148V		131U	148V		66G	59G	95I	66H	98E	49E	79G	43C
4.3	115U	115T	131U		115T	131U		13B	33C	52E	13B	26C	20C	33E	20C
5.1	164W			164V				56I	49I	79L	56I	82I	46G	72I	
5.2								36G	30G	46I	30E	49E	23G	36I	
5.3								23E	20E	33G	20E	33G	20C	33E	
6.1		328V	410W		328V	410W	410V	131E	213H		131D	230G	213G		213F
6.2		656V	722W		656V	722W	722V	164I	216J		164I	279I	174I		230F
6.3		656V	722W		656V	722W	722V	148K	131J	233J	148I	262I	112H	184I	112G
6.4		262U	328V		262U	328V	328U	66F	102G	164I	66F	115G	98G	157I	98G
7.1	738Z	738W	820W	738Y	738W	820W	935W	180I	246L		164G	230H	197J		174H
7.2	738Z	738W	820W	738Y	738W	820W	935W	164M	148N		164M	328M	148N		148N
7.3	492Y	590V	656V	492X	590V	656V	623V	121K	131N		102I	180I	131N		131N
7.4	213Y	394V	492V	213X	394V	492V	312V	115I	118J	157J	108I	180J	92I	157I	98G
8.1	246Z			246X				213G	180J		213G	295G	180I		180H
8.2	377V			377V				164G	131H		164G		131G		131F
8.3								115F			115F				
9.1															
10.1															

Visual Index - Drills

	HSS-E	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	
	DIN ANSI	DIN 1869/1	DIN 1869/2	DIN 1869/3	ANSI	ANSI	ANSI	ANSI	DIN 338	DIN 338	DIN 338	DIN 338	DIN 338	ANSI	DIN 338	ANSI
	10XD	15XD	20XD	25XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD
	130°	130°	130°	130°	118°	118°	118°	118°	118°	118°	118°	118°	118°	118°	118°	135°
	Alcrona Top					ST	TIN	TIN		ST	ST	TIN	TIN		ST	Purple Bond
	W	W	W	W			N	N	N	N	N	N	N		N	
	A941	A976	A977	A978	R10P R15P R18P	R10 R15 R18	A012	A012S	2A	2AB	A100	A002	A002S	L10	A101	HX10 HX15 HX18
	1.00 - 16.00	1.50 - 14.00	1.50 - 14.00	3.00 - 10.00	N97 - 11/16	N80 - 11/16	N80 - 3/4	1/16 - 1/2	0.15 - 15.00	1.00 - 17.50	0.20 - 20.00	1.00 - 16.00	2.00 - 13.00	1/32 - 1/2	1.00 - 12.00	1/16 - 1/2
	68	71	71	71	74	74	78	78	82	82	82	82	82	89	90	92
1.1	174G	102C	102B	102A	115H	115H	154J	154J	115H	115H	115H	154J	154J	115H	35H	115H
1.2	151G	85C	85B	85A	98H	98H	131J	131J	98H	98H	98H	131J	131J	98H	30H	69H
1.3	118G	72C	72B	72A	82F	82F	115F	115F	82F	82F	82F	115F	115F	82F	25F	75I
1.4	118G	72C	72B	72A	66F	66F	98F	98F	66F	66F	66F	98F	98F	66F	20F	69H
1.5	75D	39A	39A	39A	43E	43E	59F	59F	43E	43E	43E	59F	59F	43E	13E	56F
1.6	56D	33A	33A	33A	30D	30D	33E	33E	30D	30D	30D	33E	33E	30D	9D	
1.7																
1.8																
2.1	56C	39B	39B	39A	49E	49E	66F	66F	49E	49E	49E	66F	66F	49E	15E	105I
2.2	30E	23C	23B	23A	26G	26G	39G	39G	26G	26G	26G	39G	39G	26G	8G	59H
2.3	36B	26A	26A	26A	30C	30C	52C	52C	30C	30C	30C	52C	52C	30C	9C	56F
2.4																
3.1	118I				98H	98H	131J	131J	98H	98H	98H	131J	131J	98H	30H	171L
3.2	98I	75C	75B	75A	79F	79F	98E	98E	79F	79F	79F	98E	98E	79F	24F	89I
3.3	98I	52C	52B	52A	66E	66E	92E	92E	66E	66E	66E	92E	92E	66E	20E	95H
3.4	79H	36A	36A	36A	46E	46E	85E	85E	46E	46E	46E	85E	85E	46E	14E	59F
4.1	82F	49C	49B	49A	75E	75E	75F	75F	75E	75E	75E	75F	75F	75E	23E	95H
4.2	59D	36A	36A	36A	39D	39D	43D	43D	39D	39D	39D	43D	43D	39D	12D	75H
4.3	26D	16A	16A	16A	20B	20B	23B	23B	20B	20B	20B	23B	23B	20B	6B	
5.1					33G	33G	43G	43G	33G	33G	33G	43G	43G	33G	10G	59H
5.2					20E	20E	23E	23E	20E	20E	20E	23E	23E	20E	6E	
5.3					10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	3A	
6.1					108G	108G	164G	164G	108G	108G	108G	164G	164G	108G	33G	
6.2					115I	115I	108I	108I	115I	115I	115I	108I	108I	115I	35I	
6.3	157H	98D	98C	98B	89H	89H	128H	128H	89H	89H	89H	128H	128H	89H	27H	
6.4	138H	89D	89C	89B	52G	52G	98G	98G	52G	52G	52G	98G	98G	52G	16G	
7.1					108J	108J	134K	134K	108J	108J	108J	134K	134K	108J	33J	
7.2					98I	98I	125J	125J	98I	98I	98I	125J	125J	98I	30I	
7.3					89H	89H	108I	108I	89H	89H	89H	108I	108I	89H	27H	
7.4	138H	89D	89C	89B	79F	79F	108I	108I	79F	79F	79F	108I	108I	79F	24F	
8.1					98J	98J	98I	98I	98J	98J	98J	98I	98I	98J	30J	
8.2					92H	92H	164H	164H	92H	92H	92H	164H	164H	92H	28H	
8.3					46F	46F	115F	115F	46F	46F	46F	115F	115F	46F	14F	
9.1					10B	10B	10B	10B	10B	10B	10B	10B	10B	10B	3B	
10.1																

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS
	ANSI	ANSI	ANSI	DIN 338	ANSI	ANSI	DIN 338	DIN 338	ANSI	DIN 338	NAS 907	ANSI	DIN ANSI	ANSI
	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	3XD	2.5XD	2.5XD	2.5XD
	118°	135°	118°	135°	135°	135°	135°	135°	135°	135°	135°	118°	135°	135°
	ST	ST		ST		TIN		TIN	Bronze	Bronze	Bronze		TIN	ST
			W	W						N			N	
														
														
	R10A R15A R18A	R10B R15B R18B	R10H R18H	A108	QC21P	QC21G	QC21PM	QC21GM	R10CO R15CO R18CO	2ACO	R88CO R89CO	R40 R41 R42	A022	R40C R41C R42C
	1/16 - 1/2	1/16 - 1/2	N80 - 1/2	1.00 - 16.00	1/16 - 11/16	1/16 - 1/2	1.50 - 17.50	1.50 - 13.00	N80 - 11/16	1.00 - 13.00	1/16 - 1/2	N60 - 2"	0.50 - 16.00	N60 - 1/2
	95	98	101	101	106	106	109	109	110	110	115	117	120	123
1.1	115J	115J	108I	115I	98F	115F	98F	115F	115J	115J	115J	115J	115K	115J
1.2	98H	98H	92I	98I	59F	69F	59F	69F	98H	98H	98H	98J	105K	98J
1.3	89G	89G		82G	66H	75H	66H	75H	89G	89G	89G	89G	82I	89G
1.4	79F	79F		66F	59F	69F	59F	69F	79F	79F	79F	69G	75H	69G
1.5	56E	56E		43E	46D	56D	46D	56D	56E	56E	56E	46F	52G	46F
1.6	33D	33D		30D					33D	33D	33D	33E	33E	33E
1.7														
1.8														
2.1	72E	72E		49E	89H	105H	89H	105H	72E	72E	72E	52F	49G	52F
2.2	36G	36G		30G	49F	59F	49F	59F	36G	36G	36G	30H	26I	30H
2.3	49C	49C		33D	49D	59D	49D	59D	49C	49C	49C	33D	30E	33D
2.4														
3.1	115H	115H	82F	98H	151H	171H	151H	171H	115H	115H	115H	105J	105K	105J
3.2	92D	92D	66D	79F	79H	89H	79H	89H	92D	92D	92D	89G	82I	89G
3.3	72E	72E	52C	66E	79F	95F	79F	95F	72E	72E	72E	66F	66G	66F
3.4	56E	56E	33C	46E		59D		59D	56E	56E	56E	52F	52G	52F
4.1	92F	92F	49C	82G	89H		89H		92F	92F	92F	89G	82I	89G
4.2	66D	66D		52E	49F		49F		66D	66D	66D	52E	46F	52E
4.3	36C	36C		23B					36C	36C	36C	26C	26C	26C
5.1	49G	49G	23E	39G	49F	59H	49F	59H	49G	49G	49G	43H	43H	43H
5.2	23E	23E		23G					23E	23E	23E	26F	26F	26F
5.3	20B	20B		20E					20B	20B	20B	13B	13B	13B
6.1	125H	125H	115H	108G	89I	98I	89I	98I	125H	125H	125H	118H	118H	118H
6.2	131F	131F	118G	115I	79H	89H	79H	89H	131F	131F	131F	125J	125K	125J
6.3	89H	89H		102H	79H	89H	79H	89H	89H	89H	89H	89I	89I	89I
6.4	69F	69F		52G					69F	69F	69F	52H	52I	52H
7.1	108J	108J	148J	108J	351H	400H	351H	400H	108J	108J	108J	108K	131F	108K
7.2	98I	98I	115J	98I	325H	351H	325H	351H	98I	98I	98I	98J	105K	98J
7.3	98H	98H	98G	89H					98H	98H	98H	98I	105J	98I
7.4	89F	89F	95G	79F	276H	315H	276H	315H	89F	89F	89F	82I	82J	82I
8.1			138J	98J								98K	98K	98K
8.2			131I	92H								115I	115I	115I
8.3			66G	46F								56G	56G	56G
9.1	20C	20C		10B					20C	20C	20C	13C	13C	13C
10.1														

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS	HSS
	ANSI	DIN 1897	ANSI	ANSI	DIN 1899	ANSI	DIN 1897	ANSI	DIN 340	ANSI	ANSI	ANSI	DIN 340	DIN 340	ANSI	ANSI	ANSI
	2.5XD	2.5XD	3XD	3XD	2.5XD	2.5XD	2.5XD	6XD	6XD	6XD	6XD	6XD	6XD	6XD	6XD	12XD	15XD
	135°	135°	135°	135°	118°	135°	135°	118°	118°	118°	135°	135°	135°	135°	135°	118°	118°
	ST	ST		TIN		Bronze	Bronze					TIN	TIN	Bronze			
		N			N		N		N	W							
	A245	4ASM	QC41P	QC41G	A720	M40CO M41CO M42CO	4ASMC0	R51 R52 R55	5ATL	R51FS	QC91P	QC91G	QC91PM	QC91GM	M51CO M52CO	0860 1290	1511 1813
	N40 - 29/64	1.00 - 12.50	1/16 - 11/16	1/16 - 1/2	0.15 - 1.40	N60 - 3/4	2.30 - 12.00	N80 - 1.3/4	1.00 - 31.00	1/16 - 1/2	1/16 - 11/16	1/16 - 1/2	1.50 - 17.00	1.50 - 12.50	1/16 - 1"	1/8 - 3/4	3/16 - 1"
	123	126	128	128	130	131	134	135	139	141	142	142	144	144	145	147	149
1.1	115J	115J	98F	115F	115A	125K	125K	89G	89G		98F	115F	98F	115F	89G	79E	79E
1.2	98J	98J	59F	69F	98A	108H	108H	82G	82G		59F	69F	59F	69F	82G	72E	72E
1.3	89G	89G	66H	75H	89A	98G	98G	66E	66E		66H	75H	66H	75H	66E	52C	52C
1.4	69G	69G	59F	69F	75A	89G	89G	52E	52E		59F	69F	59F	69F	52E	49C	49C
1.5	46F	46F	46D	56D	56A	59F	59F	30D	30D		46D	56D	46D	56D	30D	20A	20A
1.6	33E	33E			33A	36E	36E	20B	20B						20B	16A	16A
1.7																	
1.8																	
2.1	52F	52F	89H	105H	72A	72F	72F	33D	33D		89H	105H	89H	105H	33D	30C	30C
2.2	30H	30H	49F	59F	33A	36H	36H	20F	20F		49F	59F	49F	59F	20F	13E	13E
2.3	33D	33D	49D	59D	49A	49D	49D	13B	13B		49D	59D	49D	59D	13B	26A	26A
2.4																	
3.1	105J	105J	151H	171H	98A	112K	112K	92H	92H		151H	171H	151H	171H	92H	72G	72G
3.2	89G	89G	79H	89H	79A	98F	98F	69E	69E		79H	89H	79H	89H	69E	59D	59D
3.3	66F	66F	79F	95F	66A	72F	72F	49D	49D		79F	95F	79F	95F	49D	43C	43C
3.4	52F	52F		59D	46A	56F	56F	43D	43D			59D		59D	43D	30C	30C
4.1	89G	89G	89H		75A	98G	98G	56E	56E		89H		89H	56E	36D	36D	
4.2	52E	52E	49F		56A	59F	59F	30C	30C		49F		49F	30C	30B	30B	
4.3	26C	26C			26A	33C	33C	13A	13A					13A	16A	16A	
5.1	43H	43H	49F	59H	33A	49H	49H	26F	26F		49F	59H	49F	59H	26F	16E	16E
5.2	26F	26F			23A	30F	30F	13D	13D					13D	13C	13C	
5.3	13B	13B			13A	20C	20C	10A	10A					10A	10A	10A	
6.1	118H	118H	89I	98I	115A	125I	125I	98E	98E	89I	89I	98I	89I	98I	98E	79D	79D
6.2	125J	125J	79H	89H	131A	131K	131K	105H	105H		79H	89H	79H	89H	105H	108G	108G
6.3	89I	89I	79H	89H	115A	89J	89J	89G	89G		79H	89H	79H	89H	89G	72F	72F
6.4	52H	52H			89A	52I	52I	52E	52E					52E	52D	52D	
7.1	108K	108K	351H		115A	115K	115K	105I	105I	348H	351H	400H	351H	400H	105I	79H	79H
7.2	98J	98J	325H		98A	108J	108J	89H	89H	325H	325H	351H	325H	351H	89H	72G	72G
7.3	98I	98I			89A	102I	102I	89G	89G						89G	72F	72F
7.4	82I	82I	276H		89A	98G	98G	82E	82E	276H	276H	315H	276H	315H	82E	66E	66E
8.1	98K	98K			157A	115M	115M	115I	115I						115I	98H	98H
8.2	115I	115I			82A	92K	92K	85G	85G						85G	85F	85F
8.3	56G	56G			56I	56I	56I	39E	39E						39E	33D	33D
9.1	13C	13C				20C	20C	10A	10A						10A	10A	10A
10.1																	

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	
	BS 328	ANSI	NAS 907	NAS 907	NAS 907	NAS 907	NAS 907	NAS 907	ANSI	DIN 345	DIN 345	DIN 341	DIN 1870/1	DIN 1870/1	DIN 1870/2	ANSI
	10XD	10XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	6XD	10XD	15XD	20XD	4XD
	ST				ST	ST	Bronze	Bronze	ST	ST	TIN	ST	ST	ST	ST	Bronze
	N		N	N						N	N	N	N	W	W	
	A125	QC0860P QC1290P	A243	A244	500-6 501-6 502-6	500-12 501-12 502-12	CO500-6 CO501-6	CO500-12 CO500-12	209 S209	5ATS	A530	A350	A345	A951	A952	209CO
	1.40 - 1"	1/8 - 1/2	3/32 - 1/4	1/8 - 1/4	N60 - 1/2	3/64 - 1/2	1/16 - 1/4	1/16 - 1/4	1/8 - 2"	5.00 - 50.00	8.50 - 40.00	5.00 - 50.00	8.00 - 50.00	10.00 - 30.00	8.00 - 40.00	1/4 - 1.1/2
	149	154	156	156	157	160	162	162	164	167	167	167	170	172	172	174
1.1	79E	98F							115I	115I	154I	89I	79G	89G	89G	115J
1.2	72E	59F							98I	98I	131I	82I	72G	72G	72G	98H
1.3	52C	66H	82F	82F	82F	82F			82F	82F	98F	66G	56E	62E	62E	89G
1.4	49C	59F	66F	66F	66F	66F			66F	66F	89F	52F	49D	49D	49D	75F
1.5	20A	46D	43E	43E	43E	43E			39E	39E	66E	33E	20C	26C	26C	56E
1.6	16A		30D	30D	30D	30D	20B	20B	30D	30D	33D	20D	16B	20B	20B	33D
1.7																
1.8																
2.1	30C	89H	49E	49E	49E	49E	95H	95H	49E	49E	79E	43E	39C	39C	39C	79E
2.2	13E	49F	26G	26G	26G	26G	56F	56F	30G	30G	43G	13G	13E	20E	20E	36G
2.3	26A	49D	30C	30C	30C	30C	56D	56D	33C	33C	66C	26C	26A	39A	39A	56C
2.4							30D	30D								
3.1	72G	151H	98I	98I	98I	98I	161H	161H	98I	98I	118I	85I	72G	72G	72G	115J
3.2	59D	79H	79F	79F	79F	79F	85H	85H	79E	79E	92E	66F	59D	52D	52D	92G
3.3	43C	79F	66E	66E	66E	66E	85F	85F	66E	66E	89E	59E	43C	43C	43C	72E
3.4	30C		46E	46E	46E	46E	56D	56D	46E	46E	72E	36E	30C	30C	30C	56E
4.1	36D		75F	75F	75F	75F			75F	75F	105F	52F	49D	59D	59D	92G
4.2	30B		39D	39D	39D	39D			43D	43D	59D	30D	30B	33B	33B	66D
4.3	16A		20B	20B	20B	20B	20D	20D	23B	23B	43B	16B	16A	20A	20A	36C
5.1	16E	49F	33G	33G	33G	33G			33G	33G	43G	26G	26E	23E	23E	49G
5.2	13C		20E	20E	20E	20E	20B	20B	23E	23E	20E	13E	13C	16C	16C	23E
5.3	10A		10A	10A	10A	10A	16B	16B	13A	13A	10A	10A	10A	10A	10A	20B
6.1	79D								108F	108F	197G	108F	89D	72D	72D	125L
6.2	108G	79H							115I	115I	180I	115I	108G	108G	108G	131J
6.3	72F	75H	89H	89H	89H	89H			115H	115H	131G	115H	89F	72F	72F	89H
6.4	52D		52G	52G	52G	52G			52F	52F	115E	52F	52D	52D	52D	69F
7.1	79H	348H							85J	85J	180I	108J	108H	98H	98H	108J
7.2	72G	325H							98I	98I	148I	82I	89G	89G	89G	98I
7.3	72F								92H	92H	115G	89H	89F	79F	79F	98H
7.4	66E	276H	79F	79F	79F	79F			75H	75H	92G	82H	79F	72F	72F	89F
8.1	98H	151D							98K	98K	164J	115L	98J	98J	98J	115K
8.2	85F	125D							92J	92J	164H	85J	98H	98H	98H	92J
8.3	33D								46H	46H	115F	39H	33F	33F	33F	66H
9.1	10A		10B	10B	10B	10B			10B	10B	10B	10B	10A	10A	10A	16C
10.1																

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS-E	HSS HM	HSS HM	HM	HM	HM	HSS	HSS	HSS	HSS	HSS	HSS
		ANSI	ANSI	ANSI	ANSI		DIN 338									
	4XD	4XD	4XD	1.5XD	4XD	4XD	4XD	3XD	3XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD
	ST	ST	ST	ST	ST	ST	ST					TIN		TIN		TIN
							N									
	A170	R56	R57	R58	R56CO	D444	A160	D33F D33W D33L	D33M	DS-90 DS-120 DS-142	SPS-90	SPSG-90	SPS-120	SPSG-120	SPR-90	SPRG-90
	13.00 - 1.1/2	33/64 - 1.1/2	33/64 - 1.1/2	1" - 2"	33/64 - 1"	N32 - 1/2	4.00 - 16.00	N68 - 1/2	0.80 - 12.00	1/8 - 1/2	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"
	176	178	180	182	183	184	186	187	190	191	192	192	192	192	193	193
1.1	115H	115H	115H	98F	115H	197E	197E	279S	279S	279S	115E	115E	115E	115E	115E	115E
1.2	98H	98H	98H	59F	98H	197E	197E	246S	246S	246S	98E	98E	98E	98E	98E	98E
1.3	82F	82F	82F	66H	82F	180D	180D	246S	246S	246S	89C	89C	89C	89C	89C	89C
1.4	66E	66E	66E	59F	66E	164D	164D	230S	230S	230S	69C	69C	69C	69C	69C	69C
1.5	43D	43D	43D	46D	43D	131C	131C	148S	148S	148S	46C	46C	46C	46C	46C	46C
1.6	30C	30C	30C		30C	121A	121A	148S	148S	148S	33B	33B	33B	33B	33B	33B
1.7								98S	98S	98S						
1.8								98S	98S	98S						
2.1	49D	49D	49D	89H	49D	131B	131B	98S	98S	174S	52C	52C	52C	52C	52C	52C
2.2	23F	23F	23F	49F	23F	115C	115C			148S	30D	30D	30D	30D	30D	30D
2.3	23B	23B	23B	49D	23B	115A	115A				33B	33B	33B	33B	33B	33B
2.4																
3.1	89H	89H	89H	151H	89H	164C	164C	246T	246T	246T	105E	105E	105E	105E	105E	105E
3.2	72E	72E	72E	79H	72E	131A	131A	246T	246T	246T	89C	89C	89C	89C	89C	89C
3.3	62D	62D	62D	79F	62D	115A	115A	180T	180T	180T	66C	66C	66C	66C	66C	66C
3.4	39D	39D	39D		39D	98A	98A	180T	180T	180T	52B	52B	52B	52B	52B	52B
4.1	56E	56E	56E	89H	56E	115A	115A			148T	89C	89C	89C	89C	89C	89C
4.2	30C	30C	30C	49F	30C	115A	115A			115T	39B	39B	39B	39B	39B	39B
4.3	16A	16A	16A		16A	82A	82A			82S	23A	23A	23A	23A	23A	23A
5.1	26F	26F	26F	49F	26F	98A	98A			148T	43D	43D	43D	43D	43D	43D
5.2	13D	13D	13D	23F	13D	82A	82A			98S	26C	26C	26C	26C	26C	26C
5.3	10A	10A	10A	13B	10A	66A	66A			66S	13A	13A	13A	13A	13A	13A
6.1	115F	115F	115F	108F	115F	180D	180D			902V	89D	89D	89D	89D	89D	89D
6.2	108H	108H	108H	115H	108H	230G	230G	820V	820V	820V	108E	108E	108E	108E	108E	108E
6.3	89G	89G	89G	115H	89G	197C	197C	820V	820V	820V	89D	89D	89D	89D	89D	89D
6.4	52F	52F	52F	52F	52F	164C	164C			230T	52D	52D	52D	52D	52D	52D
7.1	108I	108I	108I	85I	108I	164I	164I	656V	656V	656V	108E	108E	108E	108E	108E	108E
7.2	98H	98H	98H	98H	98H	148H	148H	656V	656V	656V	98E	98E	98E	98E	98E	98E
7.3	89G	89G	89G	92H	89G	131G	131G	367V	367V	367V	98D	98D	98D	98D	98D	98D
7.4	72G	72G	72G	75H	72G	115F	115F	197V	197V	197V	82D	82D	82D	82D	82D	82D
8.1	98I	98I	98I	98I	98I			197X	197X	197X	98F	98F	98F	98F	98F	98F
8.2	92G	92G	92G	92I	92G	197E	197E	328V	328V	328V	115E	115E	115E	115E	115E	115E
8.3	46E	46E	46E	46H	46E						56D	56D	56D	56D	56D	56D
9.1	10A	10A	10A	10B	10A	30C	30C				39A	39A	39A	39A	39A	39A
10.1																

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS	HSS	HM	HSS	HSS	HSS	HSS-E	HSS	HSS	HSS	HSS	
	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1.5XD				4XD
	SPR-120	SPRG-120	SPL-90	SPLG-90	SPL-120	SPLG-120	DC	76HA	A225	A217	A218	A221	TS41	TS10 TS18	TS51 TS52	ATR41
	1/4 - 1"	1/4 - 1/2	1/4 - 1"	1/4 - 1"	1/4 - 5/8	1/4 - 1/2	N0 - N6	N000 - N8	3/64 - 5/16	N1 - N8	N1 - N8	N00 - N8	N40 - N10	N40 - 1/4	N40 - 1/4	Size 1 - 4
	193	193	194	194	194	194	195	196	197	197	197	198	199	199	199	200
1.1	115E	115E	115E	115E	115E	115E	279S	115I	115I	115I	115I	115I	115J	115J	115J	
1.2	98E	98E	98E	98E	98E	98E	246S	98I	98I	98I	98I	98I	98J	98J	98J	
1.3	89C	89C	89C	89C	89C	89C	246S	82G	82G	82G	82G	82G	89G	89G	89G	82F
1.4	69C	69C	69C	69C	69C	69C	230S	66F	66F	66F	66F	66F	69G	69G	69G	66F
1.5	46C	46C	46C	46C	46C	46C	148S	43E	43E	43E	43E	43E	46F	46F	46F	43E
1.6	33B	33B	33B	33B	33B	33B	148S	30D	30D	30D	30D	30D	33E	33E	33E	30D
1.7							98S									
1.8							98S									
2.1	52C	52C	52C	52C	52C	52C		49E	49E	49E	49E	49E	52F	52F	52F	49E
2.2	30D	30D	30D	30D	30D	30D		26G	26G	26G	26G	26G	30H	30H	30H	26G
2.3	33B	33B	33B	33B	33B	33B		33C	33C	33C	33C	33C	33D	33D	33D	30C
2.4																
3.1	105E	105E	105E	105E	105E	105E	246T	98I	98I	98I	98I	98I	105J	105J	105J	98I
3.2	89C	89C	89C	89C	89C	89C	246T	79F	79F	79F	79F	79F	89G	89G	89G	79F
3.3	66C	66C	66C	66C	66C	66C	180T	66E	66E	66E	66E	66E	66F	66F	66F	66E
3.4	52B	52B	52B	52B	52B	52B	180T	46E	46E	46E	46E	46E	52F	52F	52F	46E
4.1	89C	89C	89C	89C	89C	89C		79F	79F	79F	79F	79F	89G	89G	89G	75F
4.2	39B	39B	39B	39B	39B	39B		43D	43D	43D	43D	43D	52E	52E	52E	39D
4.3	23A	23A	23A	23A	23A	23A		23B	23B	23B	23B	23B	26C	26C	26C	20B
5.1	43D	43D	43D	43D	43D	43D		33G	33G	33G	33G	33G	43H	43H	43H	33G
5.2	26C	26C	26C	26C	26C	26C		16E	16E	16E	16E	16E	26F	26F	26F	20E
5.3	13A	13A	13A	13A	13A	13A		13A	13A	13A	13A	13A	13B	13B	13B	10A
6.1	89D	89D	89D	89D	89D	89D		115G	115G	115G	115G	115G	118H	118H	118H	
6.2	108E	108E	108E	108E	108E	108E	820V	108I	108I	108I	108I	108I	125J	125J	125J	
6.3	89D	89D	89D	89D	89D	89D	820V	89H	89H	89H	89H	89H	89I	89I	89I	89H
6.4	52D	52D	52D	52D	52D	52D		52G	52G	52G	52G	52G	52H	52H	52H	52G
7.1	108E	108E	108E	108E	108E	108E	656V	108J	108J	108J	108J	108J	108K	108K	108K	
7.2	98E	98E	98E	98E	98E	98E	656V	98I	98I	98I	98I	98I	98J	98J	98J	
7.3	98D	98D	98D	98D	98D	98D	367V	89H	89H	89H	89H	89H	98I	98I	98I	
7.4	82D	82D	82D	82D	82D	82D	197V	72H	72H	72H	72H	72H	82I	82I	82I	79F
8.1	98F	98F	98F	98F	98F	98F	197X	98J	98J	98J	98J	98J	98K	98K	98K	
8.2	115E	115E	115E	115E	115E	115E	328V	92H	92H	92H	92H	92H	115I	115I	115I	
8.3	56D	56D	56D	56D	56D	56D		46F	46F	46F	46F	46F	56G	56G	56G	
9.1	39A	39A	39A	39A	39A	39A		10B	10B	10B	10B	10B	13C	13C	13C	10B
10.1																