

Hardness Conversion Chart

Box C D E F 15-N 30-N 45-N 30-T 3000 500 kg 136 Approx Training 500 kg 136 kg		Rockwell						ockwe	II Supe	rficial	Brinell		Vickers	Shore	
	Α	В	С	D	E	F	15-N	30-N	45-N	30-T		500 kg	136		Tensile Strength
86.0 69 77.7 93.5 85.0 76.5 10444 99 85.6 68 76.9 93.2 84.4 75.4 940 97 85.0 67 76.1 92.9 83.6 74.2 900 95 84.5 66 75.4 92.2 81.9 72.0 739 832 91 83.4 64 73.8 91.8 81.1 71.0 722 800 88 82.3 62 72.2 91.1 79.3 88.8 688 746 85 81.8 61 <td< th=""><th></th><th>1/16"</th><th></th><th></th><th>1/8"</th><th>1/16"</th><th></th><th></th><th></th><th>30 kg 1/16" Ball</th><th>Ball</th><th></th><th></th><th></th><th>(psı)</th></td<>		1/16"			1/8"	1/16"				30 kg 1/16" Ball	Ball				(psı)
85.6 68 76.9 93.2 84.4 75.4 940 97 86.0 67 76.1 92.9 83.6 74.2 900 95 84.5 66 75.4 92.2 81.9 72.0 739 865 92 83.9 65 74.5 92.2 81.9 72.0 739 832 91 82.8 63 73.0 91.4 80.1 69.9 705 772 87 82.3 62 72.2 91.1 79.3 68.8 688 746 85 81.8 61 71.5 90.7 78.4 67.7 670 <t< td=""><td>86.5</td><td></td><td>70</td><td>78.5</td><td></td><td></td><td>94.0</td><td>86.0</td><td>77.6</td><td></td><td></td><td></td><td>1076</td><td>101</td><td></td></t<>	86.5		70	78.5			94.0	86.0	77.6				1076	101	
86.0 67 76.1 92.9 83.6 74.2 900 95 84.5 66 75.4 92.5 82.8 73.2 865 92 83.9 65 74.5 92.2 81.9 72.0 739 832 91 83.4 64 73.8 91.8 81.1 71.0 722 800 88 82.8 63 73.0 91.4 80.1 69.9 705 772 87 81.8 61 71.5 90.7 78.4 67.7 670 720 83 81.2 60 70.7 90.2 77.5 66.6 654 697 81 320.000	86.0		69	77.7			93.5	85.0	76.5				1044	99	
84.5 66 75.4 92.5 82.8 73.2 865 92 83.9 65 74.5 92.2 81.9 72.0 739 832 91 82.8 64 73.8 91.8 81.1 71.0 722 800 88 82.3 62 72.2 91.1 79.3 68.8 668 746 85 81.8 61 71.5 90.7 78.4 67.7 670 720 83 81.2 60 70.7 90.2 77.5 66.6 654 697 81 320,000 80.7 59 89.3 75.7 64.3 615 674 80 310,000 80.1	85.6		68	76.9			93.2	84.4	75.4				940	97	
83.9 65 74.5 92.2 81.9 72.0 73.9 83.2 91 82.4 64 73.8 91.8 81.1 71.0 722 800 88 82.3 62 72.2 91.1 79.3 68.8 688 746 85 81.8 61 71.5 90.7 78.4 67.7 670 720 83 81.2 60 70.7 90.2 77.5 66.6 654 697 81 320,000 80.7 59 69.9 89.3 75.7 64.3 615 674 80 310,000 79.0 58 69.2 89.3 75.7 64.3 <td>85.0</td> <td></td> <td>67</td> <td>76.1</td> <td></td> <td></td> <td>92.9</td> <td>83.6</td> <td>74.2</td> <td></td> <td></td> <td></td> <td>900</td> <td>95</td> <td></td>	85.0		67	76.1			92.9	83.6	74.2				900	95	
83.4 64 73.8 91.8 81.1 71.0 722 800 88 82.8 63 73.0 91.1 79.3 68.8 705 772 87 82.3 62 72.2 91.1 79.3 68.8 688 746 85 81.8 61 71.5 90.7 78.4 67.7 670 720 83 81.2 60 70.7 90.2 77.5 66.6 654 697 81 320,000 80.7 59 69.9 89.3 75.7 64.3 674 80 310,000 80.1 58 69.2 89.3 75.7 64.3 615 683 76 290,000 <t< td=""><td>84.5</td><td></td><td>66</td><td>75.4</td><td></td><td></td><td>92.5</td><td>82.8</td><td>73.2</td><td></td><td></td><td></td><td>865</td><td>92</td><td></td></t<>	84.5		66	75.4			92.5	82.8	73.2				865	92	
82.8 63 73.0 91.4 80.1 69.9 705 772 87 82.3 62 72.2 91.1 79.3 68.8 688 746 85 81.8 61 71.5 90.7 78.4 67.7 670 720 83 81.2 60 70.7 90.2 77.5 66.6 654 697 81 320,000 80.7 59 69.9 89.8 76.6 65.5 634 674 80 310,000 80.1 58 69.2 89.3 75.7 64.3 615 653 78 300,000 79.0 56 67.7 88.9 74.8 63.2 </td <td>83.9</td> <td></td> <td>65</td> <td>74.5</td> <td></td> <td></td> <td>92.2</td> <td>81.9</td> <td>72.0</td> <td></td> <td>739</td> <td></td> <td>832</td> <td>91</td> <td></td>	83.9		65	74.5			92.2	81.9	72.0		739		832	91	
82.3 62 72.2 91.1 79.3 68.8 688 746 85 81.8 61 71.5 90.7 78.4 67.7 670 720 83 81.2 60 70.7 90.2 77.5 66.6 654 697 81 320,000 80.7 59 69.9 89.8 76.6 65.5 634 674 80 310,000 80.1 58 69.2 89.3 75.7 64.3 615 653 78 300,000 79.6 57 68.5 88.9 74.8 63.2 595 633 76 290,000 79.0 56 67.7 88.3 73.9 62.0 577	83.4		64	73.8			91.8	81.1	71.0		722		800	88	
81.8 61 71.5 90.7 78.4 67.7 670 720 83 81.2 60 70.7 90.2 77.5 66.6 654 697 81 320,000 80.7 59 69.9 89.8 76.6 65.5 634 674 80 310,000 80.1 58 69.2 89.3 75.7 64.3 615 653 78 300,000 79.6 57 68.5 88.9 74.8 63.2 595 633 76 290,000 79.0 56 67.7 88.3 73.9 62.0 577 613 75 282,000 78.5 120 55 66.9 87.9 73.0 60.9 <	82.8		63	73.0			91.4	80.1	69.9		705		772	87	
81.2 60 70.7 90.2 77.5 66.6 654 697 81 320,000 80.7 59 69.9 89.8 76.6 65.5 634 674 80 310,000 80.1 58 69.2 89.3 75.7 64.3 615 653 78 300,000 79.6 57 68.5 88.9 74.8 63.2 595 633 76 290,000 79.0 56 67.7 88.3 73.9 62.0 577 613 75 282,000 78.5 120 55 66.9 87.9 73.0 60.9 560 595 74 274,000 78.0 120 54 66.1 87.9 73.0 60.9	82.3		62	72.2			91.1	79.3	68.8		688		746	85	
80.7 59 69.9 89.8 76.6 65.5 634 674 80 310,000 80.1 58 69.2 89.3 75.7 64.3 615 653 78 300,000 79.6 57 68.5 88.9 74.8 63.2 595 633 76 290,000 79.0 56 67.7 88.3 73.9 62.0 577 613 75 282,000 78.5 120 55 66.9 87.9 73.0 60.9 560 595 74 274,000 78.0 120 54 66.1 87.4 72.0 59.8 543 577 72 266,000 77.4 119 53 65.4 86.9 71.2 58.6 525 560 71 257,000	81.8		61	71.5			90.7	78.4	67.7		670		720	83	
80.1 58 69.2 89.3 75.7 64.3 615 653 78 300,000 79.6 57 68.5 88.9 74.8 63.2 595 633 76 290,000 79.0 56 67.7 88.3 73.9 62.0 577 613 75 282,000 78.5 120 55 66.9 87.4 72.0 59.8 560 595 74 274,000 78.0 120 54 66.1 87.4 72.0 59.8 543 577 72 266,000 77.4 119 53 65.4 86.9 71.2 58.6 525 560 71 257,000 76.8 119 52 64.6 86.4 70.2	81.2		60	70.7			90.2	77.5	66.6		654		697	81	320,000
79.6 57 68.5 88.9 74.8 63.2 595 633 76 290,000 79.0 56 67.7 88.3 73.9 62.0 577 613 75 282,000 78.5 120 55 66.9 87.4 72.0 59.8 560 595 74 274,000 78.0 120 54 66.1 87.4 72.0 59.8 543 577 72 266,000 77.4 119 53 65.4 86.9 71.2 58.6 525 560 71 257,000 76.8 119 52 64.6 86.4 70.2 57.4 500 544 69 245,000 <t< td=""><td>80.7</td><td></td><td>59</td><td>69.9</td><td></td><td></td><td>89.8</td><td>76.6</td><td>65.5</td><td></td><td>634</td><td></td><td>674</td><td>80</td><td>310,000</td></t<>	80.7		59	69.9			89.8	76.6	65.5		634		674	80	310,000
79.0 56 67.7 88.3 73.9 62.0 577 613 75 282,000 78.5 120 55 66.9 87.9 73.0 60.9 560 595 74 274,000 78.0 120 54 66.1 87.4 72.0 59.8 543 577 72 266,000 77.4 119 53 65.4 86.9 71.2 58.6 525 560 71 257,000 76.8 119 52 64.6 86.4 70.2 57.4 500 544 69 245,000 76.3 118 51 63.8 85.9 69.4 56.1 487 528 68 239,000 75.9 117 49 62.1 85.5 68.5 55.0	80.1		58	69.2			89.3	75.7	64.3		615		653	78	300,000
78.5 120 55 66.9 87.9 73.0 60.9 560 595 74 274,000 78.0 120 54 66.1 87.4 72.0 59.8 543 577 72 266,000 77.4 119 53 65.4 86.9 71.2 58.6 525 560 71 257,000 76.8 119 52 64.6 86.4 70.2 57.4 500 544 69 245,000 76.3 118 51 63.8 85.9 69.4 56.1 528 68 239,000 75.9 117 50 63.1 85.5 68.5 55.0 475 513 67 233,000 75.2 117 49 62.1 85.0 67.6 53.8 464	79.6		57	68.5			88.9	74.8	63.2		595		633	76	290,000
78.0 120 54 66.1 87.4 72.0 59.8 543 577 72 266,000 77.4 119 53 65.4 86.9 71.2 58.6 525 560 71 257,000 76.8 119 52 64.6 86.4 70.2 57.4 500 544 69 245,000 76.3 118 51 63.8 85.9 69.4 56.1 487 528 68 239,000 75.9 117 50 63.1 85.5 68.5 55.0 475 513 67 233,000 75.2 117 49 62.1 85.0 67.6 53.8 464 498 66 227,000 74.7 116 48 61.4 84.5 66.7 52.5	79.0		56	67.7			88.3	73.9	62.0		577		613	75	282,000
77.4 119 53 65.4 86.9 71.2 58.6 525 560 71 257,000 76.8 119 52 64.6 86.4 70.2 57.4 500 544 69 245,000 76.3 118 51 63.8 85.9 69.4 56.1 487 528 68 239,000 75.9 117 50 63.1 85.5 68.5 55.0 475 513 67 233,000 75.2 117 49 62.1 85.0 67.6 53.8 464 498 66 227,000 74.7 116 48 61.4 84.5 66.7 52.5 451 484 64 221,000 73.6 115 46 60.0 83.5 64.8 50.3	78.5	120	55	66.9			87.9	73.0	60.9		560		595	74	274,000
76.8 119 52 64.6 86.4 70.2 57.4 500 544 69 245,000 76.3 118 51 63.8 85.9 69.4 56.1 487 528 68 239,000 75.9 117 50 63.1 85.5 68.5 55.0 475 513 67 233,000 75.2 117 49 62.1 85.0 67.6 53.8 464 498 66 227,000 74.7 116 48 61.4 84.5 66.7 52.5 451 484 64 221,000 73.6 115 46 60.0 83.5 64.8 50.3 432 458 62 212,000 73.1 115 45 59.2 83.0 64.0 49.0	78.0	120	54	66.1			87.4	72.0	59.8		543		577	72	266,000
76.3 118 51 63.8 85.9 69.4 56.1 487 528 68 239,000 75.9 117 50 63.1 85.5 68.5 55.0 475 513 67 233,000 75.2 117 49 62.1 85.0 67.6 53.8 464 498 66 227,000 74.7 116 48 61.4 84.5 66.7 52.5 451 484 64 221,000 74.1 116 47 60.8 83.9 65.8 51.4 442 471 63 217,000 73.6 115 46 60.0 83.5 64.8 50.3 432 458 62 212,000 73.1 115 45 59.2 83.0 64.0	77.4	119	53	65.4			86.9	71.2	58.6		525		560	71	257,000
75.9 117 50 63.1 85.5 68.5 55.0 475 513 67 233,000 75.2 117 49 62.1 85.0 67.6 53.8 464 498 66 227,000 74.7 116 48 61.4 84.5 66.7 52.5 451 484 64 221,000 74.1 116 47 60.8 83.9 65.8 51.4 442 471 63 217,000 73.6 115 46 60.0 83.5 64.8 50.3 432 458 62 212,000 73.1 115 45 59.2 83.0 64.0 49.0 421 446 60 206,000 72.5 114 44 58.5 82.5 63.1	76.8	119	52	64.6			86.4	70.2	57.4		500		544	69	245,000
75.2 117 49 62.1 85.0 67.6 53.8 464 498 66 227,000 74.7 116 48 61.4 84.5 66.7 52.5 451 484 64 221,000 74.1 116 47 60.8 83.9 65.8 51.4 471 63 217,000 73.6 115 46 60.0 83.5 64.8 50.3 432 458 62 212,000 73.1 115 45 59.2 83.0 64.0 49.0 421 446 60 206,000 72.5 114 44 58.5 82.5 63.1 47.8 409 434 58 200,000	76.3	118	51	63.8			85.9	69.4	56.1		487		528	68	239,000
74.7 116 48 61.4 84.5 66.7 52.5 451 484 64 221,000 74.1 116 47 60.8 83.9 65.8 51.4 442 471 63 217,000 73.6 115 46 60.0 83.5 64.8 50.3 432 458 62 212,000 73.1 115 45 59.2 83.0 64.0 49.0 421 446 60 206,000 72.5 114 44 58.5 82.5 63.1 47.8 409 434 58 200,000	75.9	117	50	63.1			85.5	68.5	55.0		475		513	67	233,000
74.1 116 47 60.8 83.9 65.8 51.4 442 471 63 217,000 73.6 115 46 60.0 83.5 64.8 50.3 432 458 62 212,000 73.1 115 45 59.2 83.0 64.0 49.0 421 446 60 206,000 72.5 114 44 58.5 82.5 63.1 47.8 409 434 58 200,000	75.2	117	49	62.1			85.0	67.6	53.8		464		498	66	227,000
73.6 115 46 60.0 83.5 64.8 50.3 432 458 62 212,000 73.1 115 45 59.2 83.0 64.0 49.0 421 446 60 206,000 72.5 114 44 58.5 82.5 63.1 47.8 409 434 58 200,000	74.7	116	48	61.4			84.5	66.7	52.5		451		484	64	221,000
73.1 115 45 59.2 83.0 64.0 49.0 421 446 60 206,000 72.5 114 44 58.5 82.5 63.1 47.8 409 434 58 200,000	74.1	116	47	60.8			83.9	65.8	51.4		442		471	63	217,000
72.5 114 44 58.5 82.5 63.1 47.8 409 434 58 200,000	73.6	115	46	60.0			83.5	64.8	50.3		432		458	62	212,000
	73.1	115	45	59.2			83.0	64.0	49.0		421		446	60	206,000
72.0 113 43 57.7 82.0 62.2 46.7 400 423 57 196,000	72.5	114	44	58.5			82.5	63.1	47.8		409		434	58	200,000
	72.0	113	43	57.7			82.0	62.2	46.7		400		423	57	196,000



71.5 113 42 56.9 81.5 61.3 45.5 390 412 56 1 70.9 112 41 56.2 80.9 60.4 44.3 381 402 55 1 70.4 112 40 55.4 79.9 58.6 41.9 371 392 54 1 69.9 111 39 54.6 79.4 57.7 40.8 362 382 52 1 69.4 110 38 53.8 77.4 57.7 40.8 353 372 51 1 68.9 110 37 53.1 77.8 56.8 39.6 344 363 50 1 68.4 109
70.4 112 40 55.4 80.4 59.5 43.1 371 392 54 1 69.9 111 39 54.6 79.9 58.6 41.9 362 382 52 1 69.4 110 38 53.8 79.4 57.7 40.8 353 372 51 1 68.9 110 37 53.1 78.8 56.8 39.6 344 363 50 1 68.4 109 36 52.3 77.7 55.0 37.2 327 345 48 1 67.9 109 35 51.5 77.7 55.0 37.2 327 345 48 1 67.4
69.9 111 39 54.6 79.9 58.6 41.9 362 382 52 1 69.4 110 38 53.8 79.4 57.7 40.8 353 372 51 1 68.9 110 37 53.1 78.8 56.8 39.6 344 363 50 1 68.4 109 36 52.3 77.7 55.0 37.2 327 345 48 1 67.9 109 35 51.5 77.7 55.0 37.2 327 345 48 1 67.4 108 34 50.8 77.2 54.2 36.1 319 336 47 1 66.8 108
69.4 110 38 53.8 79.4 57.7 40.8 353 372 51 1 68.9 110 37 53.1 78.8 56.8 39.6 344 363 50 1 68.4 109 36 52.3 78.3 55.9 38.4 336 354 49 1 67.9 109 35 51.5 77.2 55.0 37.2 327 345 48 1 66.8 108 33 50.0 76.6 53.3 34.9 311 327 46 1 66.8 108 33 50.0 76.6 53.3 34.9 311 327 46 1 66.8 106
68.9 110 37 53.1 78.8 56.8 39.6 344 363 50 1 68.4 109 36 52.3 78.3 55.9 38.4 336 354 49 1 67.9 109 35 51.5 77.7 55.0 37.2 327 345 48 1 67.4 108 34 50.8 77.2 54.2 36.1 319 336 47 1 66.8 108 33 50.0 76.6 53.3 34.9 311 327 46 1 66.3 107 32 49.2 76.1 52.1 33.7 301 318 44 1 65.3 105 30 47.7 75.6 51.3 32.5 294
68.4 109 36 52.3 78.3 55.9 38.4 336 354 49 1 67.9 109 35 51.5 77.7 55.0 37.2 327 345 48 1 67.4 108 34 50.8 77.2 54.2 36.1 319 336 47 1 66.8 108 33 50.0 76.6 53.3 34.9 311 327 46 1 66.3 107 32 49.2 76.6 51.3 32.5 294 310 43 44 1 65.8 106 31 48.4 75.0 50.4 31.3 294 310 42 1 64.7
67.9 109 35 51.5 77.7 55.0 37.2 327 345 48 1 67.4 108 34 50.8 77.2 54.2 36.1 319 336 47 1 66.8 108 33 50.0 76.6 53.3 34.9 311 327 46 1 66.3 107 32 49.2 76.1 52.1 33.7 301 318 44 1 65.8 106 31 48.4 75.6 51.3 32.5 294 310 43 1. 65.3 105 30 47.7 75.0 50.4 31.3 286 302 42 1. 64.7 104
67.4 108 34 50.8 77.2 54.2 36.1 319 336 47 1 66.8 108 33 50.0 76.6 53.3 34.9 311 327 46 1 66.3 107 32 49.2 76.1 52.1 33.7 301 318 44 1 65.8 106 31 48.4 75.6 51.3 32.5 294 310 43 1 65.3 105 30 47.7 75.0 50.4 31.3 286 302 42 1 64.7 104 29 47.0 74.5 49.5 30.1 279 294 41 1 64.3 104 28 46.1 73.9 48.6 28.9 271
66.8 108 33 50.0 76.6 53.3 34.9 311 327 46 1. 66.3 107 32 49.2 76.1 52.1 33.7 301 318 44 1. 65.8 106 31 48.4 75.6 51.3 32.5 294 310 43 1. 65.3 105 30 47.7 75.0 50.4 31.3 286 302 42 1. 64.7 104 29 47.0 74.5 49.5 30.1 279 294 41 1. 64.3 104 28 46.1 73.9 48.6 28.9 271 286 41 1 63.8 103 27 45.2 73.3 47.7 27.8 </td
66.3 107 32 49.2 76.1 52.1 33.7 301 318 44 1 65.8 106 31 48.4 75.6 51.3 32.5 294 310 43 1. 65.3 105 30 47.7 75.0 50.4 31.3 286 302 42 1. 64.7 104 29 47.0 74.5 49.5 30.1 279 294 41 1 64.3 104 28 46.1 73.9 48.6 28.9 271 286 41 1 63.8 103 27 45.2 73.3 47.7 27.8 264 279 40 1 63.3 103 26 44.6 72.8 46.8 26.7
65.8 106 31 48.4 75.6 51.3 32.5 294 310 43 1 65.3 105 30 47.7 75.0 50.4 31.3 286 302 42 1 64.7 104 29 47.0 74.5 49.5 30.1 279 294 41 1 64.3 104 28 46.1 73.9 48.6 28.9 271 286 41 1 63.8 103 27 45.2 73.3 47.7 27.8 264 279 40 1 63.3 103 26 44.6 72.8 46.8 26.7 258 272 39 1 62.8 102
65.3 105 30 47.7 75.0 50.4 31.3 286 302 42 1 64.7 104 29 47.0 74.5 49.5 30.1 279 294 41 1 64.3 104 28 46.1 73.9 48.6 28.9 271 286 41 1 63.8 103 27 45.2 73.3 47.7 27.8 264 279 40 1 63.3 103 26 44.6 72.8 46.8 26.7 258 272 39 1 62.8 102 25 43.8 72.2 45.9 25.5 253 266 38 1 62.4 101 24 43.1 71.6 45.0 24.3
64.7 104 29 47.0 74.5 49.5 30.1 279 294 41 1 64.3 104 28 46.1 73.9 48.6 28.9 271 286 41 1 63.8 103 27 45.2 73.3 47.7 27.8 264 279 40 1 63.3 103 26 44.6 72.8 46.8 26.7 258 272 39 1 62.8 102 25 43.8 72.2 45.9 25.5 253 266 38 1 62.4 101 24 43.1 71.6 45.0 24.3 247 260 37 1 62.0 100 23 42.1 71.0 44.0 23.1 82.0
64.3 104 28 46.1 73.9 48.6 28.9 271 286 41 1 63.8 103 27 45.2 73.3 47.7 27.8 264 279 40 1 63.3 103 26 44.6 72.8 46.8 26.7 258 272 39 1 62.8 102 25 43.8 72.2 45.9 25.5 253 266 38 1 62.4 101 24 43.1 71.6 45.0 24.3 247 260 37 1 62.0 100 23 42.1 71.0 44.0 23.1 82.0 240 201 254 36 1 61.5 99 22 41.6 70.5 43.2 22.0 81.5 234
63.8 103 27 45.2 73.3 47.7 27.8 264 279 40 1. 63.3 103 26 44.6 72.8 46.8 26.7 258 272 39 1. 62.8 102 25 43.8 72.2 45.9 25.5 253 266 38 1. 62.4 101 24 43.1 71.6 45.0 24.3 247 260 37 1. 62.0 100 23 42.1 71.0 44.0 23.1 82.0 240 201 254 36 1 61.5 99 22 41.6 70.5 43.2 22.0 81.5 234 195 248 35 1 61.0 98 21 40.9 69.9 42.3 20.7 81.0 </td
63.3 103 26 44.6 72.8 46.8 26.7 258 272 39 1. 62.8 102 25 43.8 72.2 45.9 25.5 253 266 38 1. 62.4 101 24 43.1 71.6 45.0 24.3 247 260 37 1. 62.0 100 23 42.1 71.0 44.0 23.1 82.0 240 201 254 36 1 61.5 99 22 41.6 70.5 43.2 22.0 81.5 234 195 248 35 1 61.0 98 21 40.9 69.9 42.3 20.7 81.0 228 189 243 35 1 60.5 97 20 40.1 69.4 41.5 19.6 80.5
62.8 102 25 43.8 72.2 45.9 25.5 253 266 38 1 62.4 101 24 43.1 71.6 45.0 24.3 247 260 37 1 62.0 100 23 42.1 71.0 44.0 23.1 82.0 240 201 254 36 1 61.5 99 22 41.6 70.5 43.2 22.0 81.5 234 195 248 35 1 61.0 98 21 40.9 69.9 42.3 20.7 81.0 228 189 243 35 1 60.5 97 20 40.1 69.4 41.5 19.6 80.5 222 184 238 34 10 59.0 96 18 80.0 216 179
62.4 101 24 43.1 71.6 45.0 24.3 247 260 37 1 62.0 100 23 42.1 71.0 44.0 23.1 82.0 240 201 254 36 1 61.5 99 22 41.6 70.5 43.2 22.0 81.5 234 195 248 35 1 61.0 98 21 40.9 69.9 42.3 20.7 81.0 228 189 243 35 1 60.5 97 20 40.1 69.4 41.5 19.6 80.5 222 184 238 34 1 59.0 96 18 80.0 216 179 230 33 1 58.0 95 16 79.0 210 175 222 32 <td< td=""></td<>
62.0 100 23 42.1 71.0 44.0 23.1 82.0 240 201 254 36 1 61.5 99 22 41.6 70.5 43.2 22.0 81.5 234 195 248 35 1 61.0 98 21 40.9 69.9 42.3 20.7 81.0 228 189 243 35 1 60.5 97 20 40.1 69.4 41.5 19.6 80.5 222 184 238 34 1 59.0 96 18 80.0 216 179 230 33 1 58.0 95 16 79.0 210 175 222 32 1
61.5 99 22 41.6 70.5 43.2 22.0 81.5 234 195 248 35 1 61.0 98 21 40.9 69.9 42.3 20.7 81.0 228 189 243 35 1 60.5 97 20 40.1 69.4 41.5 19.6 80.5 222 184 238 34 1 59.0 96 18 80.0 216 179 230 33 1 58.0 95 16 79.0 210 175 222 32 1
61.0 98 21 40.9 69.9 42.3 20.7 81.0 228 189 243 35 1 60.5 97 20 40.1 69.4 41.5 19.6 80.5 222 184 238 34 1 59.0 96 18 80.0 216 179 230 33 1 58.0 95 16 79.0 210 175 222 32 1
60.5 97 20 40.1 69.4 41.5 19.6 80.5 222 184 238 34 11 59.0 96 18 80.0 216 179 230 33 11 58.0 95 16 79.0 210 175 222 32 11
59.0 96 18 80.0 216 179 230 33 1 58.0 95 16 79.0 210 175 222 32 1
58.0 95 16 79.0 210 175 222 32 1
57.5 94 15 78.5 205 171 213 31 1
57.0 93 13 78.0 200 167 208 30 9
56.5 92 12 77.5 195 163 204 29
56.0 91 10 77.0 190 160 196 28 9
55.5 90 9 76.0 185 157 192 27 9
55.0 89 8 75.5 180 154 188 26 8
54.0 88 7 75.0 176 151 184 26 8
53.5 87 6 74.5 172 148 180 26 8
53.0 86 5 74.0 169 145 176 25 8
52.5 85 4 73.5 165 142 173 25 8
52.0 84 3 73.0 162 140 170 25 7
51.0 83 2 72.0 159 137 166 24 7



50.5	82	1							71.5	156	135	163	24	76,000
50.0	81	0					 		71.0	153	133	160	24	75,000
49.5	80					 			70.0	150	130			73,000
49.0	79								69.5	147	128			
48.5	78								69.0	144	126			
48.0	77								68.0	141	124			
						<u> </u>					122			
47.0	76								67.5	139	120			
46.5	75				99.5	 			67.0	137				
46.0	74				99.0	 			66.0	135	118			
45.5	73				98.5				65.5	132	116			
45.0	72		 		98.0				65.0	130	114			
44.5	71			100.0	97.5				64.2	127	112			
44.0	70			99.5	97.0				63.5	125	110			
43.5	69			99.0	96.0				62.8	123	109			
43.0	68			98.0	95.5				62.0	121	107			
42.5	67			97.5	95.0				61.4	119	106			
42.0	66			97.0	94.5				60.5	117	104			
41.8	65			96.0	94.0				60.1	116	102			
41.5	64			95.5	93.5				59.5	114	101			
41.0	63			95.0	93.0				58.7	112	99			
40.5	62			94.5	92.0				58.0	110	98			
40.0	61			93.5	91.5				57.3	108	96			
39.5	60			93.0	91.0				56.5	107	95			
39.0	59			92.5	90.5				55.9	106	94			
38.5	58			92.0	90.0				55.0	104	92			
38.0	57			91.0	89.5				54.6	102	91			
37.8	56			90.5	89.0				54.0	101	90			
37.5	55			90.0	88.0				53.2	99	89			
37.0	54			89.5	87.5				52.5		87			
36.5	53			89.0	87.0				51.8		86			
36.0	52			88.0	86.5				51.0		85			
35.5	51			87.5	86.0				50.4		84			
35.0	50			87.0	85.5				49.5		83			
34.8	49			86.5	85.0				49.1		82			
34.5	48			85.5	84.5				48.5		81			
34.0	47			85.0	84.0				47.7		80			
33.5	46			84.5	83.0				47.0		79			
			<u> </u>	1									<u> </u>	



33.0										
32.0 43 82.5 81.5 44.8 <	33.0	45	 	84.0	82.5	 	 46.2	 79	 	
31.5 42 82.0 81.0 44.0 <	32.5	44	 	83.5	82.0	 	 45.5	 78	 	
31.0 41 81.5 80.5 43.4 76 30.8 40 81.0 79.5 <	32.0	43	 	82.5	81.5	 	 44.8	 77	 	
30.8 40 81.0 79.5 43.0 74 30.5 39 80.0 79.0 42.1 74 30.0 38 79.5 78.5 441.5 73	31.5	42	 	82.0	81.0	 	 44.0	 76	 	
30.5 39 80.0 79.0 42.1 74 </td <td>31.0</td> <td>41</td> <td> </td> <td>81.5</td> <td>80.5</td> <td> </td> <td> 43.4</td> <td> 75</td> <td> </td> <td></td>	31.0	41	 	81.5	80.5	 	 43.4	 75	 	
30.0 38 79.5 78.5 41.5 73 40.7 72 <td< td=""><td>30.8</td><td>40</td><td> </td><td>81.0</td><td>79.5</td><td> </td><td> 43.0</td><td> 74</td><td> </td><td></td></td<>	30.8	40	 	81.0	79.5	 	 43.0	 74	 	
29.5 37 79.0 78.0 40.7 72 <td< td=""><td>30.5</td><td>39</td><td> </td><td>80.0</td><td>79.0</td><td> </td><td> 42.1</td><td> 74</td><td> </td><td></td></td<>	30.5	39	 	80.0	79.0	 	 42.1	 74	 	
29.0 36 78.5 77.5 40.0 71 <td< td=""><td>30.0</td><td>38</td><td> </td><td>79.5</td><td>78.5</td><td> </td><td> 41.5</td><td> 73</td><td> </td><td></td></td<>	30.0	38	 	79.5	78.5	 	 41.5	 73	 	
28.5 35 78.0 77.0 39.3 71 <td< td=""><td>29.5</td><td>37</td><td> </td><td>79.0</td><td>78.0</td><td> </td><td> 40.7</td><td> 72</td><td> </td><td></td></td<>	29.5	37	 	79.0	78.0	 	 40.7	 72	 	
28.0 34 77.0 76.5 38.5 70 27.8 33 76.5 75.5 37.9 69 27.5 32 76.0 75.0 37.5 68 26.5 30 75.0 74.0 36.0 67 26.0 29 74.0 73.5 36.0 67 25.5 28 73.5 73.0 34.5 66 25.0 27 73.0 72.5 33.1 </td <td>29.0</td> <td>36</td> <td> </td> <td>78.5</td> <td>77.5</td> <td> </td> <td> 40.0</td> <td> 71</td> <td> </td> <td></td>	29.0	36	 	78.5	77.5	 	 40.0	 71	 	
27.8 33 76.5 75.5 37.9 69 27.5 32 76.0 75.0 37.5 68 26.5 30 75.0 74.0 36.0 67 26.0 29 74.0 73.5 35.2 66 25.5 28 73.5 73.0 33.8 65 25.0 27 73.0 72.5 33.1 65 24.5 26 72.0 71.0 33.1 65 <td>28.5</td> <td>35</td> <td> </td> <td>78.0</td> <td>77.0</td> <td> </td> <td> 39.3</td> <td> 71</td> <td> </td> <td></td>	28.5	35	 	78.0	77.0	 	 39.3	 71	 	
27.5 32 76.0 75.0 37.5 68 27.0 31 75.5 74.5 <	28.0	34	 	77.0	76.5	 	 38.5	 70	 	
27.0 31 75.5 74.5 36.6 68 26.5 30 75.0 74.0 67 26.0 29 74.0 73.5 66 25.5 28 73.0 72.5 66 25.0 27 73.0 72.5 66 24.5 26 72.5 72.0 65 24.2 25 72.0 71.0 33.1 24.0 24 70.5	27.8	33	 	76.5	75.5	 	 37.9	 69	 	
26.5 30 75.0 74.0 67 26.0 29 74.0 73.5 35.2 66 25.5 28 73.5 73.0 66 25.0 27 73.0 72.5 33.8 65 24.5 26 72.5 72.0	27.5	32	 	76.0	75.0	 	 37.5	 68	 	
26.0 29 74.0 73.5 <td< td=""><td>27.0</td><td>31</td><td> </td><td>75.5</td><td>74.5</td><td> </td><td> 36.6</td><td> 68</td><td> </td><td></td></td<>	27.0	31	 	75.5	74.5	 	 36.6	 68	 	
25.5 28 73.5 73.0 34.5 66 25.0 27 73.0 72.5 33.8 65 24.5 26 72.0 71.0 33.1 65 24.2 25 72.0 71.0 32.4 64 24.0 24 71.0 70.5 32.0 64 23.5 23 70.5 70.0 31.1 63 23.0 22 70.0 69.5 30.4 63 22.5 </td <td>26.5</td> <td>30</td> <td> </td> <td>75.0</td> <td>74.0</td> <td> </td> <td> 36.0</td> <td> 67</td> <td> </td> <td></td>	26.5	30	 	75.0	74.0	 	 36.0	 67	 	
25.0 27 73.0 72.5 33.8 65 24.5 26 72.0 71.0 33.1 65 24.2 25 71.0 32.4 64 24.0 24 71.0 70.5 32.0 64 23.5 23 70.5 70.0 31.1 63 23.0 22 70.0 69.5 30.4 63 22.5 21 69.5 69.0 29.7 62 22.0 20 <td>26.0</td> <td>29</td> <td> </td> <td>74.0</td> <td>73.5</td> <td> </td> <td> 35.2</td> <td> 66</td> <td> </td> <td></td>	26.0	29	 	74.0	73.5	 	 35.2	 66	 	
24.5 26 72.0 33.1 65	25.5	28	 	73.5	73.0	 	 34.5	 66	 	
24.2 25 72.0 71.0 32.4 64 24.0 24 71.0 70.5 33.0 64 23.5 23 70.0 69.5 30.4 63 23.0 22 70.0 69.5 30.4 63 22.5 21 69.5 69.0 29.7 62 22.0 20 68.5 68.5 29.0 62 21.5 19 68.5 68.5 29.0 62 21.5 </td <td>25.0</td> <td>27</td> <td> </td> <td>73.0</td> <td>72.5</td> <td> </td> <td> 33.8</td> <td> 65</td> <td> </td> <td></td>	25.0	27	 	73.0	72.5	 	 33.8	 65	 	
24.0 24 71.0 70.5 32.0 64 <td< td=""><td>24.5</td><td>26</td><td> </td><td>72.5</td><td>72.0</td><td> </td><td> 33.1</td><td> 65</td><td> </td><td></td></td<>	24.5	26	 	72.5	72.0	 	 33.1	 65	 	
23.5 23 70.5 70.0 31.1 63 23.0 22 70.0 69.5 30.4 63 <	24.2	25	 	72.0	71.0	 	 32.4	 64	 	
23.0 22 70.0 69.5 30.4 63 <td< td=""><td>24.0</td><td>24</td><td> </td><td>71.0</td><td>70.5</td><td> </td><td> 32.0</td><td> 64</td><td> </td><td></td></td<>	24.0	24	 	71.0	70.5	 	 32.0	 64	 	
22.5 21 69.5 69.0 29.7 62 22.0 20 68.5 68.5 62 21.5 19 68.0 68.0 28.1 61 21.2 18 67.5 67.0 27.4 61 21.0 17 67.0 66.5 26.7 60 20.5 16 66.5 66.0 26.0 60 20.0 15 65.5 65.5 25.3 59 14	23.5	23	 	70.5	70.0	 	 31.1	 63	 	
22.0 20 68.5 68.5 29.0 62 <td< td=""><td>23.0</td><td>22</td><td> </td><td>70.0</td><td>69.5</td><td> </td><td> 30.4</td><td> 63</td><td> </td><td></td></td<>	23.0	22	 	70.0	69.5	 	 30.4	 63	 	
21.5 19 68.0 68.0 28.1 61 21.2 18 67.5 67.0 27.4 61 21.0 17 67.0 66.5 26.7 60 20.5 16 66.5 66.0 26.0 60 20.0 15 65.5 65.5 25.3 59 14 65.0 65.0 24.6 59 13 64.5 64.5 23.9 58 11 63.5 63.5 <td>22.5</td> <td>21</td> <td> </td> <td>69.5</td> <td>69.0</td> <td> </td> <td> 29.7</td> <td> 62</td> <td> </td> <td></td>	22.5	21	 	69.5	69.0	 	 29.7	 62	 	
21.2 18 67.5 67.0 27.4 61 21.0 17 67.0 66.5 26.7 60 20.5 16 66.5 66.0 26.0 60 20.0 15 65.5 65.5 25.3 59 14 65.0 65.0 24.6 59 13 64.5 64.5 23.9 58 12 64.0 64.0 22.6 57 10 62.5 63.0	22.0	20	 	68.5	68.5	 	 29.0	 62	 	
21.0 17 67.0 66.5 26.7 60 20.5 16 66.5 66.0 26.0 60 20.0 15 65.5 65.5 25.3 59 14 65.0 65.0 24.6 59 13 64.5 64.5 23.9 58 12 64.0 64.0 23.5 58 11 63.5 63.5 22.6 57 10 62.5	21.5	19	 	68.0	68.0	 	 28.1	 61	 	
20.5 16 66.5 66.0 26.0 60 20.0 15 65.5 65.5 25.3 59 14 65.0 65.0 24.6 59 13 64.5 64.5 23.9 58 12 64.0 64.0 23.5 58 11 63.5 63.5 22.6 57 10 62.5 63.0 21.9 57	21.2	18	 	67.5	67.0	 	 27.4	 61	 	
20.0 15 65.5 65.5 25.3 59 14 65.0 65.0 24.6 59 13 64.5 64.5 23.9 58 12 64.0 64.0 23.5 58 11 63.5 63.5 22.6 57 10 62.5 63.0 21.9 57	21.0	17	 	67.0	66.5	 	 26.7	 60	 	
14 65.0 65.0 24.6 59 13 64.5 64.5 23.9 58 12 64.0 64.0 23.5 58 11 63.5 63.5 22.6 57 10 62.5 63.0 21.9 57	20.5	16	 	66.5	66.0	 	 26.0	 60	 	
13 64.5 64.5 23.9 58 12 64.0 64.0 23.5 58 11 63.5 63.5 22.6 57 10 62.5 63.0 21.9 57	20.0	15	 	65.5	65.5	 	 25.3	 59	 	
12 64.0 64.0 23.5 58 11 63.5 63.5 22.6 57 10 62.5 63.0 21.9 57		14	 	65.0	65.0	 	 24.6	 59	 	
11 63.5 63.5 22.6 57 10 62.5 63.0 21.9 57		13	 	64.5	64.5	 	 23.9	 58	 	
10 62.5 63.0 21.9 57		12	 	64.0	64.0	 	 23.5	 58	 	
		11	 	63.5	63.5	 	 22.6	 57	 	
9 62.0 62.0 21.2 56		10	 	62.5	63.0	 	 21.9	 57	 	
<u> </u>		9	 	62.0	62.0	 	 21.2	 56	 	



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 8	 	61.5	61.5	 	 20.5	 56	 	
 7	 	61.0	61.0	 	 19.8	 56	 	
 6	 	60.5	60.5	 	 19.1	 55	 	
 5	 	60.0	60.0	 	 18.4	 55	 	
 4	 	59.0	59.5	 	 18.0	 55	 	
 3	 	58.5	59.0	 	 17.1	 54	 	
 2	 	58.0	58.0	 	 16.4	 54	 	
 1	 	57.5	57.5	 	 15.7	 53	 	
 0	 	57.0	57.0	 	 15.0	 53	 	