


























# Technical Information for Endmills

| Endmills       | 2 FL Standard Endmill   | 3 FL Standard Endmill   | 4 FL Standard Endmill   | 2 FL Standard Endmill   | 3 FL Standard Endmill   | 4 FL Standard Endmill   | 2 FL Long Endmill   | 3 FL Long Endmill   | 4 FL Long Endmill   | 2 FL Long Endmill   | 3 FL Long Endmill   | 4 FL Long Endmill   |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|
|                |  |  |  |  |  |  |  |  |  |  |  |  |
| Series         | Uncoated<br>201, 202,<br>209, 213   | Uncoated<br>210, 213,<br>201, 202,<br>540   | Uncoated<br>211, 213,<br>201, 202   | PowerA<br>209, 241,<br>254, 253,<br>204, 213,<br>243                              | PowerA<br>245, 244,<br>257, 256,<br>211, 217                                      | PowerA<br>248, 247,<br>260, 259,<br>209, 215,<br>249                              | Uncoated<br>204   | Uncoated<br>205, 204  | Uncoated<br>206   | PowerA<br>255, 224,<br>226  | PowerA<br>228, 227,<br>229  | PowerA<br>231, 230,<br>232  |
| Material Group | Surface Feet Per Minute   |   |   |   |   |   |   |   |   |   |   |   |
| 1.1            | 260-400   | 260-400   | 260-400   | 525-800   | 525-800   | 525-790   | 160-230   | 160-230   | 160-230   | 330-450   | 330-460   | 330-460   |
| 1.2            | 260-400   | 260-400   | 260-400   | 525-800   | 525-800   | 525-790   | 160-230   | 160-230   | 160-230   | 330-450   | 330-460   | 330-460   |
| 1.3            | 200-260   | 200-260   | 200-260   | 400-525   | 395-525   | 395-525   | 115-165   | 115-165   | 115-165   | 230-330   | 230-330   | 230-330   |
| 1.4            | 200-260   | 200-260   | 200-260   | 395-525   | 395-525   | 395-525   | 115-165   | 115-165   | 115-165   | 230-330   | 230-330   | 230-330   |
| 1.5            | 130-200   | 130-200   | 130-200   | 395-525   | 395-525   | 260-525   | 80-115  | 80-115  | 80-115  | 165-230   | 165-230   | 165-230   |
| 1.6            | 65-130  | 65-130  | 65-130  | 135-270   | 135-270   | 130-260   | 50-65   | 50-65   | 50-65   | 100-150   | 100-150   | 100-150   |
| 1.7            |   |   |   | 135-270   | 135-270   | 130-260   |   |   |   | 100-150   | 100-150   | 100-150   |
| 1.8            |   |   |   | 135-270   | 135-270   | 130-260   |   |   |   | 100-150   | 100-150   | 100-150   |
| 1.9            |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.1            | 130-260   | 130-260   | 130-260   | 260-525   | 260-525   | 260-525   | 80-160  | 80-160  | 80-160  | 160-320   | 160-320   | 160-320   |
| 2.2            | 100-160   | 100-160   | 100-160   | 200-330   | 200-330   | 200-330   | 65-100  | 65-100  | 65-100  | 130-200   | 130-200   | 130-200   |
| 2.3            | 80-130  | 80-130  | 80-130  | 160-260   | 160-260   | 160-260   | 50-80   | 50-80   | 50-80   | 100-160   | 100-160   | 100-160   |
| 2.4            | 70-120  | 70-120  | 70-120  | 150-220   | 150-220   | 150-220   |   |   |   | 80-140  | 80-140  | 80-140  |
| 3.1            | 160-260   | 160-260   | 160-260   | 330-500   | 330-500   | 330-500   | 115-200   | 115-200   | 115-200   | 230-400   | 230-400   | 230-400   |
| 3.2            | 130-230   | 130-230   | 130-230   | 260-460   | 260-460   | 260-460   | 100-160   | 100-160   | 100-160   | 200-330   | 200-330   | 200-330   |
| 3.3            | 115-160   | 115-160   | 115-160   | 230-330   | 230-330   | 230-330   | 80-115  | 80-115  | 80-115  | 160-230   | 160-230   | 160-230   |
| 3.4            | 80-130  | 80-130  | 80-130  | 160-260   | 160-260   | 160-260   | 65-100  | 65-100  | 65-100  | 130-200   | 135-200   | 135-200   |
| 4.1            | 200-330   | 200-330   | 200-330   | 400-650   | 400-650   | 400-650   | 115-200   | 115-200   | 115-200   | 230-395   | 230-400   | 230-400   |
| 4.2            | 130-200   | 130-200   | 130-200   | 260-400   | 260-400   | 260-400   | 80-115  | 80-115  | 80-115  | 160-230   | 165-230   | 165-230   |
| 4.3            | 65-100  | 65-100  | 65-100  | 130-200   | 130-200   | 130-200   | 50-70   | 50-70   | 50-70   | 100-130   | 100-130   | 100-130   |
| 5.1            | 200-330   | 200-330   | 200-330   | 400-650   | 400-650   | 400-650   | 115-200   | 115-200   | 115-200   | 230-395   | 230-400   | 230-400   |
| 5.2            | 100-200   | 100-200   | 100-200   | 200-400   | 200-400   | 200-400   | 65-115  | 65-115  | 65-115  | 130-230   | 130-230   | 130-230   |
| 5.3            | 65-160  | 65-160  | 65-160  | 130-330   | 130-330   | 130-330   | 50-100  | 50-100  | 50-100  | 100-200   | 100-200   | 100-200   |
| 6.1            | 330-660   | 330-660   | 330-660   | 650-1,350   | 650-1,350   | 650-1,350   | 200-400   | 200-400   | 200-400   | 400-800   | 650-800   | 650-800   |
| 6.2            | 425-560   | 425-560   | 425-560   | 850-1,150   | 850-1,150   | 850-1,150   | 330-400   | 330-400   | 330-400   | 660-800   | 650-800   | 650-800   |
| 6.3            | 425-560   | 425-560   | 425-560   | 850-1,150   | 850-1,150   | 850-1,150   | 330-400   | 330-400   | 330-400   | 660-800   | 650-800   | 650-800   |
| 6.4            | 70-160  | 70-160  | 70-160  | 165-330   | 165-330   | 165-330   | 65-115  | 65-115  | 65-115  | 130-230   | 135-230   | 135-230   |
| 7.1            | 500-1,500   | 500-1,500   |   |   |   |   | 330-1,000   | 330-1,000   |   |   |   |   |
| 7.2            | 500-1,500   | 500-1,500   |   |   |   |   | 330-1,000   | 330-1,000   |   |   |   |   |
| 7.3            | 130-260   | 130-260   |   |   |   |   | 100-200   | 100-200   |   |   |   |   |
| 7.4            | 115-160   | 115-160   |   |   |   |   | 80-115  |   |   |   |   |   |
| 8.1            | 260-520   | 260-520   |   |   |   |   | 200-400   | 200-400   |   |   |   |   |
| 8.2            | 230-425   | 230-425   |   |   |   |   | 165-330   | 165-330   |   |   |   |   |
| 8.3            | 230-425   | 230-425   |   |   |   |   | 165-330   | 165-330   |   |   |   |   |
| 9.1            | 13-26   | 13-26   | 13-26   | 25-50   | 25-50   | 25-50   |   |   |   |   |   |   |

| Endmills       | 2 FL X-Long Endmill   | 3 FL X-Long Endmill   | 4 FL X-Long Endmill   | 2 FL X-Long Endmill   | 3 FL X-Long Endmill   | 4 FL X-Long Endmill   | 2 FL Square End, Minimill   | 2 FL Ball End, Minimill   | 4 FL Square End, Minimill   | 4 FL Ball End, Minimill   | 2 FL Square End, Minimill   | 2 FL Ball End, Minimill   | 4 FL Square End, Minimill   | 4 FL Ball End, Minimill   |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Series         | Uncoated<br>215   | Uncoated<br>216   | Uncoated<br>217   | PowerA<br>269,<br>268, 270  | PowerA<br>272,<br>271, 273  | PowerA<br>275,<br>274, 276  | Uncoated<br>207   | Uncoated<br>207   | Uncoated<br>207   | Uncoated<br>207   | PowerA<br>207   | PowerA<br>207   | PowerA<br>207   | PowerA<br>207   |
| Material Group | Surface Feet Per Minute   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.1            | 105-165   | 105-165   | 105-165   | 210-230   | 210-230   | 210-230   | 260-400   | 260-400   | 260-400   | 260-400   | 525-800   | 525-800   | 525-800   | 525-800   |
| 1.2            | 105-165   | 105-165   | 105-165   | 210-230   | 210-230   | 210-230   | 260-400   | 260-400   | 260-400   | 260-400   | 525-800   | 525-800   | 525-800   | 525-800   |
| 1.3            | 80-105  | 80-105  | 80-105  | 160-210   | 160-210   | 160-210   | 200-260   | 200-260   | 200-260   | 200-260   | 400-525   | 400-525   | 400-525   | 400-525   |
| 1.4            | 80-105  | 80-105  | 80-105  | 160-210   | 160-210   | 160-210   | 200-260   | 200-260   | 200-260   | 200-260   | 395-525   | 395-525   | 395-525   | 395-525   |
| 1.5            | 55-80   | 55-80   | 55-80   | 110-160   | 110-160   | 110-160   | 130-200   | 130-200   | 130-200   | 130-200   | 395-525   | 395-525   | 395-525   | 395-525   |
| 1.6            | 30-55   | 30-55   | 30-55   | 60-110  | 60-110  | 60-110  | 65-130  | 65-130  | 65-130  | 65-130  | 135-270   | 135-270   | 135-270   | 135-270   |
| 1.7            |   |   |   | 50-105  | 50-105  | 50-105  |   |   |   |   | 135-270   | 135-270   | 135-270   | 135-270   |
| 1.8            |   |   |   | 50-105  | 50-105  | 50-105  |   |   |   |   | 135-270   | 135-270   | 135-270   | 135-270   |
| 1.9            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.1            | 50-105  | 50-105  | 50-105  | 100-210   | 100-210   | 100-210   | 130-260   | 130-260   | 130-260   | 130-260   | 260-525   | 260-525   | 260-525   | 260-525   |
| 2.2            | 40-70   | 40-70   | 40-70   | 80-140  | 80-140  | 80-140  | 100-160   | 100-160   | 100-160   | 100-160   | 200-330   | 200-330   | 200-330   | 200-330   |
| 2.3            | 35-50   | 35-50   | 35-50   | 75-100  | 75-100  | 75-100  | 80-130  | 80-130  | 80-130  | 80-130  | 160-260   | 160-260   | 160-260   | 160-260   |
| 2.4            |   |   |   | 65-90   | 65-90   | 65-90   | 70-120  | 70-120  | 70-120  | 70-120  | 150-220   | 150-220   | 150-220   | 150-220   |
| 3.1            | 65-105  | 65-105  | 65-105  | 130-210   | 130-210   | 130-210   | 160-260   | 160-260   | 160-260   | 160-260   | 330-500   | 330-500   | 330-500   | 330-500   |
| 3.2            | 50-90   | 50-90   | 50-90   | 100-180   | 100-180   | 100-180   | 130-230   | 130-230   | 130-230   | 130-230   | 260-460   | 260-460   | 260-460   | 260-460   |
| 3.3            | 45-65   | 45-65   | 45-65   | 90-130  | 90-130  | 90-130  | 115-160   | 115-160   | 115-160   | 115-160   | 230-330   | 230-330   | 230-330   | 230-330   |
| 3.4            | 30-50   | 30-50   | 30-50   | 60-100  | 60-100  | 60-100  | 80-130  | 80-130  | 80-130  | 80-130  | 160-260   | 160-260   | 160-260   | 160-260   |
| 4.1            | 80-130  | 80-130  | 80-130  | 160-260   | 160-260   | 160-260   | 200-330   | 200-330   | 200-330   | 200-330   | 400-650   | 400-650   | 400-650   | 400-650   |
| 4.2            | 55-80   | 55-80   | 55-80   | 110-160   | 110-160   | 110-160   | 130-200   | 130-200   | 130-200   | 130-200   | 260-400   | 260-400   | 260-400   | 260-400   |
| 4.3            | 25-40   | 25-40   | 25-40   | 50-80   | 50-80   | 50-80   | 65-100  | 65-100  | 65-100  | 65-100  | 130-200   | 130-200   | 130-200   | 130-200   |
| 5.1            | 80-130  | 80-130  | 80-130  | 160-265   | 160-265   | 160-265   | 200-330   | 200-330   | 200-330   | 200-330   | 400-650   | 400-650   | 400-650   | 400-650   |
| 5.2            | 40-80   | 40-80   | 40-80   | 80-160  | 80-160  | 80-160  | 100-200   | 100-200   | 100-200   | 100-200   | 200-400   | 200-400   | 200-400   | 200-400   |
| 5.3            | 30-70   | 30-70   | 30-70   | 50-130  | 50-130  | 50-130  | 65-160  | 65-160  | 65-160  | 65-160  | 130-330   | 130-330   | 130-330   | 130-330   |
| 6.1            | 130-260   | 130-260   | 130-260   | 265-525   | 265-525   | 265-525   | 330-660   | 330-660   | 330-660   | 330-660   | 650-1,350   | 650-1,350   | 650-1,350   | 650-1,350   |
| 6.2            | 170-225   | 170-225   | 170-225   | 340-450   | 340-450   | 340-450   | 425-560   | 425-560   | 425-560   | 425-560   | 850-1,150   | 850-1,150   | 850-1,150   | 850-1,150   |
| 6.3            | 170-225   | 170-225   | 170-225   | 50-130  | 50-130  | 50-130  | 425-560   | 425-560   | 425-560   | 425-560   | 850-1,150   | 850-1,150   | 850-1,150   | 850-1,150   |
| 6.4            | 30-70   | 30-70   | 30-70   |   |   |   | 70-160  | 70-160  | 70-160  | 70-160  | 165-330   | 165-330   | 165-330   | 165-330   |
| 7.1            | 200-600   | 200-600   |   |   |   |   | 500-1,500   | 500-1,500   | 500-1,500   | 500-1,500   |   |   |   |   |
| 7.2            | 200-600   | 200-600   |   |   |   |   | 500-1,500   | 500-1,500   | 500-1,500   | 500-1,500   |   |   |   |   |
| 7.3            | 50-105  | 50-105  |   |   |   |   | 130-260   | 130-260   | 130-260   | 130-260   |   |   |   |   |
| 7.4            | 45-70   | 45-70   |   |   |   |   | 115-160   | 115-160   | 115-160   | 115-160   |   |   |   |   |
| 8.1            | 105-210   | 105-210   |   |   |   |   | 260-520   | 260-520   | 260-520   | 260-520   |   |   |   |   |
| 8.2            | 95-170  | 95-170  |   |   |   |   | 230-425   | 230-425   | 230-425   | 230-425   |   |   |   |   |
| 8.3            | 95-170  | 95-170  |   |   |   |   | 230-425   | 230-425   | 230-425   | 230-425   |   |   |   |   |
| 9.1            |   |   |   |   |   |   | 12-25   | 12-25   | 12-25   | 12-25   | 25-50   | 25-50   | 25-50   | 25-50   |