

| 피삭재<br>Work Material |                         | 프리하든강<br>Prehardened Steel<br>NAK, HPM |                  |                        | 열처리강<br>Hardened Steel<br>SKD61, STAVAX |                  |                        |
|----------------------|-------------------------|----------------------------------------|------------------|------------------------|-----------------------------------------|------------------|------------------------|
|                      |                         | 35~45 HRC                              |                  |                        | 55~60 HRC                               |                  |                        |
| 날경<br>Dia            | 유효장<br>Effective Length | Spindle Speed<br>(min <sup>-1</sup> )  | Feed<br>(mm/min) | Depth of Cut<br>ap(mm) | Spindle Speed<br>(min <sup>-1</sup> )   | Feed<br>(mm/min) | Depth of Cut<br>ap(mm) |
| 2.5                  | 10                      | 15,000                                 | 1,800            | 0.130                  | 12,000                                  | 900              | 0.070                  |
|                      | 16                      | 12,000                                 | 1,200            | 0.080                  | 9,000                                   | 550              | 0.050                  |
|                      | 20                      | 10,000                                 | 1,000            | 0.070                  | 8,000                                   | 450              | 0.050                  |
| 3                    | 12                      | 13,000                                 | 1,800            | 0.150                  | 10,000                                  | 950              | 0.080                  |
|                      | 16                      | 12,000                                 | 1,500            | 0.120                  | 9,000                                   | 800              | 0.070                  |
|                      | 20                      | 11,000                                 | 1,200            | 0.100                  | 8,000                                   | 600              | 0.060                  |
|                      | 25                      | 10,000                                 | 1,000            | 0.080                  | 7,500                                   | 500              | 0.050                  |
|                      | 30                      | 9,000                                  | 800              | 0.060                  | 6,500                                   | 400              | 0.030                  |
|                      | 35                      | 8,000                                  | 500              | 0.030                  | 5,500                                   | 300              | 0.010                  |
| 4                    | 12                      | 10,000                                 | 2,300            | 0.200                  | 9,000                                   | 1,000            | 0.100                  |
|                      | 16                      | 8,000                                  | 2,000            | 0.160                  | 7,000                                   | 800              | 0.090                  |
|                      | 20                      | 7,000                                  | 1,700            | 0.140                  | 6,000                                   | 750              | 0.080                  |
|                      | 25                      | 7,000                                  | 1,500            | 0.120                  | 5,500                                   | 700              | 0.070                  |
|                      | 30                      | 6,000                                  | 900              | 0.080                  | 4,500                                   | 500              | 0.040                  |
|                      | 35                      | 5,000                                  | 500              | 0.050                  | 4,000                                   | 400              | 0.020                  |
| 6                    | 20                      | 12,000                                 | 1,300            | 0.100                  | 12,000                                  | 1,100            | 0.090                  |
|                      | 30                      | 11,000                                 | 1,100            | 0.090                  | 11,000                                  | 900              | 0.070                  |
| 8                    | 24                      | 12,000                                 | 1,300            | 0.100                  | 12,000                                  | 1,100            | 0.090                  |
|                      | 40                      | 11,000                                 | 1,100            | 0.090                  | 11,000                                  | 900              | 0.070                  |
| 10                   | 30                      | 12,000                                 | 1,400            | 0.100                  | 12,000                                  | 1,200            | 0.090                  |
|                      | 50                      | 11,000                                 | 1,200            | 0.090                  | 11,000                                  | 1,000            | 0.070                  |
| 12                   | 30                      | 10,000                                 | 1,600            | 0.100                  | 10,000                                  | 1,400            | 0.090                  |
|                      | 55                      | 9,000                                  | 1,400            | 0.090                  | 9,000                                   | 1,200            | 0.070                  |

- NOTE
1. 정밀하고 강성이 있는 홀더와 장비를 사용해 주십시오.

2. ap는 축방향의 절입량을 표시합니다. ae는 반경방향의 절입량을 표시합니다.

3. ae의 설정은 [날경-(2x코너R값)] x 20~40% 범위로 권장합니다.

4. 홈 절삭시, 조건표의 ap와 피드를 50%이하로 설정해 주십시오.

5. 피삭재와 가공형상에 따라 적절한 절삭유를 사용해 주십시오.

6. 절삭 조건표는 참고자료 입니다. 실제 가공시에는 가공형상, 기계에 따라 조건을 조정해서 가공하시기 바랍니다.

1. Use a rigid and precise machine and holder.

2. ap(mm) : Axial Depth of Cut / ae(mm) : Radial Depth of Cut

3. We recommend setting ae in the range of [Dia-(2xCorner R value)] x 20~40%

4. For slotting, set ap and Feed in the condition table to 50% or less.

5. Use the appropriate coolant for the workpiece and machining shape.

6. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.
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- # HMRR430, HMR430, WMRR430, WMR430 절삭조건 참고 자료

## HMRR430, HMR430, WMRR430, WMR430 Cutting Conditions Reference Table
- | WIDE-MAX Series      |                         |                                        |                  |                        |                                         |                  |                        |                                       |                  |                        |
|----------------------|-------------------------|----------------------------------------|------------------|------------------------|-----------------------------------------|------------------|------------------------|---------------------------------------|------------------|------------------------|
| HY-MAX Series        |                         |                                        |                  |                        |                                         |                  |                        |                                       |                  |                        |
| 피삭재<br>Work Material |                         | 프리하든강<br>Prehardened Steel<br>NAK, HPM |                  |                        | 열처리강<br>Hardened Steel<br>SKD61, STAVAX |                  |                        | 열처리강<br>Hardened Steel<br>SKD11       |                  |                        |
|                      |                         | 35~45 HRC                              |                  |                        | 45~55 HRC                               |                  |                        | 55~60 HRC                             |                  |                        |
| 날경<br>Dia            | 유효장<br>Effective Length | Spindle Speed<br>(min <sup>-1</sup> )  | Feed<br>(mm/min) | Depth of Cut<br>ap(mm) | Spindle Speed<br>(min <sup>-1</sup> )   | Feed<br>(mm/min) | Depth of Cut<br>ap(mm) | Spindle Speed<br>(min <sup>-1</sup> ) | Feed<br>(mm/min) | Depth of Cut<br>ap(mm) |
| 0.6                  | 2                       | 30,000                                 | 1,200            | 0.030                  | 25,000                                  | 1,000            | 0.020                  | 23,000                                | 800              | 0.010                  |
|                      | 4                       | 25,000                                 | 900              | 0.020                  | 23,000                                  | 800              | 0.015                  | 20,000                                | 600              | 0.007                  |
|                      | 6                       | 23,000                                 | 600              | 0.010                  | 20,000                                  | 400              | 0.008                  | 18,000                                | 300              | 0.005                  |
| 0.8                  | 2                       | 28,000                                 | 2,000            | 0.040                  | 25,000                                  | 1,600            | 0.030                  | 23,000                                | 1,400            | 0.020                  |
|                      | 4                       | 28,000                                 | 1,800            | 0.030                  | 25,000                                  | 1,400            | 0.020                  | 23,000                                | 1,200            | 0.010                  |
|                      | 6                       | 23,000                                 | 1,400            | 0.020                  | 20,000                                  | 1,100            | 0.010                  | 18,000                                | 900              | 0.007                  |
| 1                    | 2.5                     | 25,000                                 | 2,100            | 0.050                  | 20,000                                  | 1,900            | 0.040                  | 16,000                                | 1,000            | 0.020                  |
|                      | 4                       | 23,000                                 | 1,800            | 0.040                  | 18,000                                  | 1,500            | 0.030                  | 14,000                                | 900              | 0.010                  |
|                      | 6                       | 18,000                                 | 1,400            | 0.020                  | 14,000                                  | 1,100            | 0.010                  | 10,000                                | 800              | 0.007                  |
|                      | 8                       | 16,000                                 | 1,200            | 0.020                  | 12,000                                  | 950              | 0.010                  | 8,000                                 | 650              | 0.005                  |
|                      | 10                      | 14,000                                 | 1,000            | 0.010                  | 10,000                                  | 800              | 0.007                  | 6,000                                 | 500              | 0.005                  |
|                      | 12                      | 12,000                                 | 800              | 0.007                  | 8,000                                   | 650              | 0.005                  | 5,000                                 | 400              | 0.003                  |
| 1.5                  | 4                       | 25,000                                 | 2,000            | 0.050                  | 20,000                                  | 1,600            | 0.040                  | 15,000                                | 1,100            | 0.030                  |
|                      | 6                       | 20,000                                 | 1,600            | 0.040                  | 18,000                                  | 1,400            | 0.030                  | 14,000                                | 1,000            | 0.020                  |
|                      | 8                       | 18,000                                 | 1,200            | 0.040                  | 14,000                                  | 1,200            | 0.030                  | 10,000                                | 750              | 0.010                  |
|                      | 10                      | 16,000                                 | 1,100            | 0.030                  | 13,000                                  | 1,000            | 0.020                  | 9,000                                 | 700              | 0.007                  |
|                      | 12                      | 14,000                                 | 1,000            | 0.030                  | 12,000                                  | 850              | 0.020                  | 8,000                                 | 630              | 0.007                  |
|                      | 14                      | 12,000                                 | 900              | 0.020                  | 10,000                                  | 800              | 0.010                  | 7,000                                 | 550              | 0.005                  |
|                      | 16                      | 12,000                                 | 850              | 0.020                  | 9,500                                   | 700              | 0.010                  | 6,500                                 | 500              | 0.005                  |
|                      | 20                      | 8,500                                  | 550              | 0.010                  | 7,000                                   | 400              | 0.070                  | 5,500                                 | 300              | 0.005                  |
| 2                    | 6                       | 18,000                                 | 1,800            | 0.060                  | 15,000                                  | 1,500            | 0.050                  | 12,000                                | 1,100            | 0.030                  |
|                      | 8                       | 16,000                                 | 1,600            | 0.050                  | 12,000                                  | 1,200            | 0.040                  | 10,000                                | 950              | 0.020                  |
|                      | 10                      | 14,000                                 | 1,400            | 0.040                  | 12,000                                  | 1,100            | 0.030                  | 9,500                                 | 850              | 0.010                  |
|                      | 12                      | 12,000                                 | 1,200            | 0.040                  | 10,000                                  | 1,000            | 0.030                  | 8,000                                 | 800              | 0.010                  |
|                      | 16                      | 10,000                                 | 1,000            | 0.030                  | 9,000                                   | 800              | 0.020                  | 7,500                                 | 650              | 0.007                  |
|                      | 20                      | 9,000                                  | 750              | 0.020                  | 8,500                                   | 700              | 0.010                  | 6,000                                 | 500              | 0.005                  |
| 2.5                  | 10                      | 14,000                                 | 1,600            | 0.070                  | 10,000                                  | 1,400            | 0.050                  | 8,000                                 | 900              | 0.030                  |
|                      | 16                      | 10,000                                 | 1,200            | 0.050                  | 8,000                                   | 1,100            | 0.020                  | 6,000                                 | 700              | 0.010                  |
|                      | 20                      | 8,500                                  | 1,100            | 0.050                  | 7,500                                   | 950              | 0.020                  | 5,000                                 | 650              | 0.010                  |
| 3                    | 10                      | 18,000                                 | 2,200            | 0.100                  | 13,000                                  | 1,800            | 0.070                  | 10,000                                | 1,200            | 0.050                  |
|                      | 12                      | 12,000                                 | 1,600            | 0.080                  | 10,000                                  | 1,400            | 0.060                  | 8,000                                 | 1,000            | 0.040                  |
|                      | 16                      | 10,000                                 | 1,400            | 0.070                  | 8,500                                   | 1,200            | 0.050                  | 7,000                                 | 800              | 0.030                  |
|                      | 20                      | 9,000                                  | 1,400            | 0.070                  | 7,500                                   | 1,200            | 0.040                  | 6,000                                 | 800              | 0.020                  |
|                      | 25                      | 8,000                                  | 1,200            | 0.060                  | 7,000                                   | 1,000            | 0.030                  | 5,000                                 | 700              | 0.010                  |
|                      | 30                      | 7,000                                  | 1,200            | 0.030                  | 6,500                                   | 1,000            | 0.020                  | 4,500                                 | 600              | 0.007                  |
| 4                    | 12                      | 12,000                                 | 2,000            | 0.100                  | 10,000                                  | 1,500            | 0.060                  | 8,500                                 | 1,100            | 0.050                  |
|                      | 16                      | 10,000                                 | 1,800            | 0.100                  | 8,000                                   | 1,400            | 0.060                  | 6,000                                 | 900              | 0.050                  |
|                      | 20                      | 9,000                                  | 1,500            | 0.080                  | 7,000                                   | 1,300            | 0.050                  | 5,500                                 | 850              | 0.030                  |
|                      | 25                      | 6,500                                  | 1,400            | 0.080                  | 5,500                                   | 1,200            | 0.050                  | 4,500                                 | 750              | 0.030                  |
|                      | 30                      | 5,000                                  | 1,000            | 0.050                  | 4,000                                   | 800              | 0.020                  | 4,000                                 | 600              | 0.010                  |
|                      | 35                      | 4,500                                  | 900              | 0.030                  | 3,800                                   | 750              | 0.010                  | 3,200                                 | 500              | 0.007                  |
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| 피삭재<br>Work Material |                            | 프리하든강<br>Prehardened Steel<br>NAK, HPM   |                  |                           | 열처리강<br>Hardened Steel<br>SKD61, STAVAX  |                  |                           | 열처리강<br>Hardened Steel<br>SKD11          |                  |                           |
|----------------------|----------------------------|------------------------------------------|------------------|---------------------------|------------------------------------------|------------------|---------------------------|------------------------------------------|------------------|---------------------------|
|                      |                            | 35~45 HRC                                |                  |                           | 45~55 HRC                                |                  |                           | 55~60 HRC                                |                  |                           |
| 날경<br>Dia            | 유효장<br>Effective<br>Length | Spindle<br>Speed<br>(min <sup>-1</sup> ) | Feed<br>(mm/min) | Depth of<br>Cut<br>ap(mm) | Spindle<br>Speed<br>(min <sup>-1</sup> ) | Feed<br>(mm/min) | Depth of<br>Cut<br>ap(mm) | Spindle<br>Speed<br>(min <sup>-1</sup> ) | Feed<br>(mm/min) | Depth of<br>Cut<br>ap(mm) |
| 5                    | 20                         | 7,000                                    | 1,800            | 0.100                     | 6,000                                    | 1,600            | 0.070                     | 5,000                                    | 1,100            | 0.050                     |
| 6                    | 20                         | 7,000                                    | 1,800            | 0.120                     | 6,000                                    | 1,400            | 0.098                     | 5,500                                    | 1,000            | 0.090                     |
|                      | 30                         | 6,000                                    | 1,500            | 0.080                     | 5,500                                    | 1,200            | 0.065                     | 5,000                                    | 900              | 0.050                     |
| 8                    | 24                         | 6,000                                    | 2,300            | 0.150                     | 5,800                                    | 2,200            | 0.100                     | 5,000                                    | 2,200            | 0.050                     |
|                      | 40                         | 5,000                                    | 1,900            | 0.100                     | 4,800                                    | 1,800            | 0.050                     | 4,000                                    | 1,700            | 0.030                     |
| 10                   | 30                         | 5,600                                    | 2,700            | 0.150                     | 5,200                                    | 2,400            | 0.100                     | 4,000                                    | 2,200            | 0.050                     |
|                      | 50                         | 4,600                                    | 2,200            | 0.100                     | 4,200                                    | 1,900            | 0.050                     | 3,000                                    | 1,600            | 0.030                     |
| 12                   | 30                         | 4,500                                    | 2,500            | 0.200                     | 4,000                                    | 1,800            | 0.150                     | 3,000                                    | 1,400            | 0.050                     |
|                      | 55                         | 3,500                                    | 1,900            | 0.150                     | 3,000                                    | 1,400            | 0.100                     | 2,000                                    | 850              | 0.030                     |

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2. ap(mm) : Axial Depth of Cut / ae(mm) : Radial Depth of Cut

3. We recommend setting ae in the range of [Dia-(2xCorner R value)] x 20~40%

4. For slotting, set ap and Feed in the condition table to 50% or less.

5. Use the appropriate coolant for the workpiece and machining shape.

6. The cutting condition table is a reference. In actual machining, adjust the conditions according to the machining shape and machine.

HMRE230 절삭조건 참고 자료

HMRE230 Cutting Conditions Reference Table

| 피삭재<br>Work Material |                            | 탄소강,합금강,주철<br>Carbon Steel, Alloy Steel, Cast Iron<br>S50C, SCM, FC250 |                  |                           | 프리하든강<br>Prehardened Steel<br>NAK, HPM   |                  |                           | 열처리강<br>Hardened Steel<br>SKD61, STAVAX  |                  |                           |
|----------------------|----------------------------|------------------------------------------------------------------------|------------------|---------------------------|------------------------------------------|------------------|---------------------------|------------------------------------------|------------------|---------------------------|
|                      |                            | ~1000 N/mm <sup>2</sup>                                                |                  |                           | 35~45 HRC                                |                  |                           | 45~52 HRC                                |                  |                           |
| 날경<br>Dia            | 유효장<br>Effective<br>Length | Spindle<br>Speed<br>(min <sup>-1</sup> )                               | Feed<br>(mm/min) | Depth of<br>Cut<br>ap(mm) | Spindle<br>Speed<br>(min <sup>-1</sup> ) | Feed<br>(mm/min) | Depth of<br>Cut<br>ap(mm) | Spindle<br>Speed<br>(min <sup>-1</sup> ) | Feed<br>(mm/min) | Depth of<br>Cut<br>ap(mm) |
| 0.1                  | 0.5                        | 40,000                                                                 | 130              | 0.003                     | 40,000                                   | 110              | 0.003                     | 40,000                                   | 90               | 0.002                     |
| 0.15                 | 0.5                        | 40,000                                                                 | 170              | 0.004                     | 40,000                                   | 150              | 0.003                     | 40,000                                   | 120              | 0.003                     |
|                      | 1                          | 40,000                                                                 | 130              | 0.002                     | 40,000                                   | 110              | 0.002                     | 40,000                                   | 90               | 0.002                     |
| 0.2                  | 0.5                        | 40,000                                                                 | 340              | 0.008                     | 36,000                                   | 240              | 0.007                     | 32,000                                   | 170              | 0.005                     |
|                      | 1                          | 40,000                                                                 | 310              | 0.006                     | 36,000                                   | 210              | 0.005                     | 32,000                                   | 140              | 0.004                     |
|                      | 1.5                        | 36,000                                                                 | 160              | 0.005                     | 34,000                                   | 140              | 0.004                     | 30,000                                   | 120              | 0.003                     |
|                      | 2                          | 32,000                                                                 | 120              | 0.003                     | 30,000                                   | 100              | 0.003                     | 27,000                                   | 60               | 0.002                     |
| 0.3                  | 1                          | 36,000                                                                 | 380              | 0.016                     | 34,000                                   | 260              | 0.013                     | 30,000                                   | 210              | 0.010                     |
|                      | 1.5                        | 36,000                                                                 | 380              | 0.015                     | 34,000                                   | 260              | 0.012                     | 30,000                                   | 210              | 0.008                     |
|                      | 2                          | 30,000                                                                 | 290              | 0.010                     | 30,000                                   | 230              | 0.008                     | 27,000                                   | 170              | 0.005                     |
|                      | 3                          | 30,000                                                                 | 270              | 0.006                     | 30,000                                   | 210              | 0.005                     | 27,000                                   | 150              | 0.003                     |
| 0.4                  | 1                          | 28,000                                                                 | 540              | 0.024                     | 27,000                                   | 380              | 0.020                     | 24,000                                   | 280              | 0.015                     |
|                      | 2                          | 28,000                                                                 | 540              | 0.020                     | 27,000                                   | 380              | 0.016                     | 24,000                                   | 280              | 0.013                     |
|                      | 3                          | 26,000                                                                 | 400              | 0.013                     | 25,000                                   | 310              | 0.010                     | 22,000                                   | 230              | 0.008                     |
|                      | 4                          | 26,000                                                                 | 380              | 0.008                     | 25,000                                   | 290              | 0.007                     | 22,000                                   | 210              | 0.005                     |
|                      | 5                          | 23,000                                                                 | 270              | 0.008                     | 22,000                                   | 200              | 0.007                     | 19,000                                   | 160              | 0.005                     |
|                      | 6                          | 23,000                                                                 | 260              | 0.005                     | 22,000                                   | 190              | 0.004                     | 19,000                                   | 150              | 0.003                     |

| 피삭재<br>Work Material |                            | 탄소강,합금강,주철<br>Carbon Steel, Alloy Steel, Cast Iron<br>S50C, SCM, FC250 |                  |                           | 프리하든강<br>Prehardened Steel<br>NAK, HPM   |                  |                           | 열처리강<br>Hardened Steel<br>SKD61, STAVAX  |                  |                           |
|----------------------|----------------------------|------------------------------------------------------------------------|------------------|---------------------------|------------------------------------------|------------------|---------------------------|------------------------------------------|------------------|---------------------------|
|                      |                            | 35~45 HRC                                                              |                  |                           | 35~45 HRC                                |                  |                           | 45~52 HRC                                |                  |                           |
| 날경<br>Dia            | 유효장<br>Effective<br>Length | Spindle<br>Speed<br>(min <sup>-1</sup> )                               | Feed<br>(mm/min) | Depth of<br>Cut<br>ap(mm) | Spindle<br>Speed<br>(min <sup>-1</sup> ) | Feed<br>(mm/min) | Depth of<br>Cut<br>ap(mm) | Spindle<br>Speed<br>(min <sup>-1</sup> ) | Feed<br>(mm/min) | Depth of<br>Cut<br>ap(mm) |
| 0.5                  | 2                          | 28,000                                                                 | 550              | 0.024                     | 27,000                                   | 440              | 0.020                     | 24,000                                   | 290              | 0.015                     |
|                      | 3                          | 26,000                                                                 | 410              | 0.016                     | 25,000                                   | 360              | 0.013                     | 22,000                                   | 240              | 0.010                     |
|                      | 4                          | 26,000                                                                 | 410              | 0.014                     | 25,000                                   | 320              | 0.012                     | 22,000                                   | 230              | 0.009                     |
|                      | 5                          | 26,000                                                                 | 390              | 0.010                     | 25,000                                   | 300              | 0.008                     | 22,000                                   | 210              | 0.007                     |
|                      | 6                          | 23,000                                                                 | 320              | 0.008                     | 22,000                                   | 210              | 0.007                     | 19,000                                   | 170              | 0.005                     |
|                      | 8                          | 23,000                                                                 | 270              | 0.004                     | 22,000                                   | 170              | 0.003                     | 19,000                                   | 140              | 0.003                     |
|                      | 10                         | 20,000                                                                 | 210              | 0.002                     | 19,000                                   | 120              | 0.002                     | 17,000                                   | 100              | 0.002                     |
| 0.6                  | 2                          | 28,000                                                                 | 790              | 0.032                     | 27,000                                   | 560              | 0.026                     | 24,000                                   | 420              | 0.018                     |
|                      | 3                          | 26,000                                                                 | 670              | 0.028                     | 24,000                                   | 500              | 0.023                     | 21,000                                   | 370              | 0.016                     |
|                      | 4                          | 26,000                                                                 | 670              | 0.019                     | 24,000                                   | 500              | 0.016                     | 21,000                                   | 370              | 0.012                     |
|                      | 5                          | 26,000                                                                 | 590              | 0.016                     | 24,000                                   | 440              | 0.013                     | 21,000                                   | 330              | 0.010                     |
|                      | 6                          | 26,000                                                                 | 590              | 0.012                     | 24,000                                   | 440              | 0.010                     | 21,000                                   | 330              | 0.008                     |
|                      | 8                          | 23,000                                                                 | 460              | 0.010                     | 21,000                                   | 280              | 0.008                     | 19,000                                   | 250              | 0.006                     |
|                      | 10                         | 23,000                                                                 | 430              | 0.006                     | 21,000                                   | 250              | 0.005                     | 19,000                                   | 220              | 0.003                     |
| 0.7                  | 2                          | 28,000                                                                 | 790              | 0.048                     | 27,000                                   | 560              | 0.039                     | 24,000                                   | 420              | 0.025                     |
|                      | 4                          | 26,000                                                                 | 590              | 0.032                     | 24,000                                   | 440              | 0.026                     | 21,000                                   | 330              | 0.018                     |
|                      | 6                          | 26,000                                                                 | 580              | 0.014                     | 24,000                                   | 430              | 0.012                     | 21,000                                   | 320              | 0.009                     |
| 0.8                  | 2                          | 28,000                                                                 | 790              | 0.064                     | 27,000                                   | 630              | 0.052                     | 24,000                                   | 470              | 0.035                     |
|                      | 3                          | 26,000                                                                 | 730              | 0.048                     | 24,000                                   | 560              | 0.039                     | 21,000                                   | 410              | 0.030                     |
|                      | 4                          | 26,000                                                                 | 730              | 0.040                     | 24,000                                   | 560              | 0.033                     | 21,000                                   | 410              | 0.024                     |
|                      | 5                          | 26,000                                                                 | 590              | 0.032                     | 24,000                                   | 560              | 0.026                     | 21,000                                   | 410              | 0.017                     |
|                      | 6                          | 26,000                                                                 | 590              | 0.024                     | 24,000                                   | 560              | 0.020                     | 21,000                                   | 410              | 0.012                     |
|                      | 8                          | 26,000                                                                 | 590              | 0.016                     | 24,000                                   | 440              | 0.013                     | 21,000                                   | 330              | 0.008                     |
|                      | 10                         | 23,000                                                                 | 400              | 0.012                     | 21,000                                   | 240              | 0.010                     | 19,000                                   | 210              | 0.006                     |
|                      | 12                         | 23,000                                                                 | 370              | 0.008                     | 21,000                                   | 210              | 0.007                     | 19,000                                   | 180              | 0.003                     |
|                      | 3                          | 26,000                                                                 | 1,100            | 0.056                     | 24,000                                   | 910              | 0.046                     | 21,000                                   | 680              | 0.035                     |
|                      | 4                          | 26,000                                                                 | 1,100            | 0.052                     | 24,000                                   | 910              | 0.042                     | 21,000                                   | 680              | 0.032                     |
|                      | 5                          | 26,000                                                                 | 1,100            | 0.040                     | 24,000                                   | 910              | 0.033                     | 21,000                                   | 680              | 0.025                     |
|                      | 6                          | 23,000                                                                 | 890              | 0.032                     | 22,000                                   | 770              | 0.026                     | 19,000                                   | 560              | 0.020                     |
| 1                    | 8                          | 23,000                                                                 | 890              | 0.028                     | 22,000                                   | 770              | 0.023                     | 19,000                                   | 560              | 0.018                     |
|                      | 10                         | 23,000                                                                 | 800              | 0.020                     | 22,000                                   | 690              | 0.016                     | 19,000                                   | 450              | 0.013                     |
|                      | 12                         | 20,000                                                                 | 600              | 0.016                     | 19,000                                   | 390              | 0.013                     | 17,000                                   | 340              | 0.010                     |
|                      | 14                         | 20,000                                                                 | 600              | 0.014                     | 19,000                                   | 390              | 0.011                     | 17,000                                   | 340              | 0.009                     |
|                      | 16                         | 20,000                                                                 | 510              | 0.009                     | 19,000                                   | 370              | 0.007                     | 17,000                                   | 290              | 0.006                     |
|                      | 20                         | 18,000                                                                 | 420              | 0.005                     | 17,000                                   | 260              | 0.004                     | 15,000                                   | 200              | 0.003                     |
|                      | 4                          | 23,000                                                                 | 970              | 0.064                     | 22,000                                   | 760              | 0.052                     | 19,000                                   | 500              | 0.040                     |
|                      | 6                          | 23,000                                                                 | 970              | 0.056                     | 22,000                                   | 760              | 0.046                     | 19,000                                   | 500              | 0.035                     |
| 1.2                  | 8                          | 20,000                                                                 | 770              | 0.036                     | 19,000                                   | 660              | 0.029                     | 17,000                                   | 450              | 0.023                     |
|                      | 10                         | 20,000                                                                 | 770              | 0.024                     | 19,000                                   | 660              | 0.020                     | 17,000                                   | 450              | 0.015                     |
|                      | 12                         | 20,000                                                                 | 620              | 0.024                     | 19,000                                   | 530              | 0.020                     | 17,000                                   | 400              | 0.015                     |
|                      | 14                         | 18,000                                                                 | 530              | 0.020                     | 17,000                                   | 460              | 0.016                     | 15,000                                   | 340              | 0.013                     |
|                      | 16                         | 18,000                                                                 | 520              | 0.016                     | 17,000                                   | 450              | 0.013                     | 15,000                                   | 330              | 0.010                     |
|                      | 4                          | 20,000                                                                 | 940              | 0.008                     | 19,000                                   | 660              | 0.007                     | 17,000                                   | 500              | 0.005                     |
|                      | 6                          | 20,000                                                                 | 940              | 0.008                     | 19,000                                   | 660              | 0.007                     | 17,000                                   | 500              | 0.005                     |
| 1.5                  | 8                          | 18,000                                                                 | 770              | 0.048                     | 17,000                                   | 590              | 0.039                     | 15,000                                   | 440              | 0.030                     |
|                      | 10                         | 18,000                                                                 | 700              | 0.048                     | 17,000                                   | 570              | 0.039                     | 15,000                                   | 430              | 0.030                     |
|                      | 12                         | 18,000                                                                 | 700              | 0.048                     | 17,000                                   | 570              | 0.039                     | 15,000                                   | 400              | 0.030                     |
|                      | 14                         | 18,000                                                                 | 690              | 0.030                     | 17,000                                   | 560              | 0.025                     | 15,000                                   | 390              | 0.019                     |
|                      | 16                         | 16,000                                                                 | 540              | 0.028                     | 15,000                                   | 340              | 0.023                     | 13,000                                   | 300              | 0.018                     |
|                      | 20                         | 16,000                                                                 | 480              | 0.024                     | 15,000                                   | 300              | 0.020                     | 13,000                                   | 260              | 0.015                     |