

ANSI Insert Nomenclature

| A - Parallelogram 85° B - Parallelogram 82° C - Diamond (Rhombic) 80° D - Diamond (Rhombic) 55° E - Diamond (Rhombic) 75° H - Hexagon K - Parallelogram 55° L - Rectangle M - Diamond (Rhombic) 86° O - Octagon P - Pentagon R - Round S - Square T - Triangle V - Diamond (Rhombic) 35° W - Trigon 80° | <table border="1"> <thead> <tr> <th>Symbol</th> <th>I.C.</th> <th>Thickness</th> </tr> </thead> <tbody> <tr><td>A</td><td>.001"</td><td>.001"</td></tr> <tr><td>B</td><td>.001"</td><td>.005"</td></tr> <tr><td>C</td><td>.001"</td><td>.001"</td></tr> <tr><td>D</td><td>.001"</td><td>.005"</td></tr> <tr><td>E</td><td>.001"</td><td>.001"</td></tr> <tr><td>F</td><td>.0005"</td><td>.001"</td></tr> <tr><td>G</td><td>.001"</td><td>.005"</td></tr> <tr><td>H</td><td>.0005"</td><td>.001"</td></tr> <tr><td>M</td><td>.002-.004"</td><td>.005"</td></tr> <tr><td>U</td><td>.005-.010"</td><td>.005"</td></tr> </tbody> </table> | Symbol | I.C. | Thickness | A | .001" | .001" | B | .001" | .005" | C | .001" | .001" | D | .001" | .005" | E | .001" | .001" | F | .0005" | .001" | G | .001" | .005" | H | .0005" | .001" | M | .002-.004" | .005" | U | .005-.010" | .005" | <table border="1"> <thead> <tr> <th>Insert</th> <th>I.C.</th> <th>Thickness</th> <th>Radius</th> </tr> </thead> <tbody> <tr><td>21.5</td><td>1/4"</td><td>3/32"</td><td>.004"</td></tr> <tr><td>21.50.5</td><td>1/4"</td><td>3/32"</td><td>.008"</td></tr> <tr><td>21.51</td><td>1/4"</td><td>3/32"</td><td>1/64"</td></tr> <tr><td>21.52</td><td>1/4"</td><td>3/32"</td><td>1/32"</td></tr> <tr><td>220</td><td>1/4"</td><td>1/8"</td><td>.004"</td></tr> <tr><td>22.5</td><td>1/4"</td><td>1/8"</td><td>.008"</td></tr> <tr><td>221</td><td>1/4"</td><td>1/8"</td><td>1/64"</td></tr> <tr><td>222</td><td>1/4"</td><td>1/8"</td><td>1/32"</td></tr> <tr><td>22.5</td><td>1/4"</td><td>5/32"</td><td>.004"</td></tr> <tr><td>22.50.5</td><td>1/4"</td><td>5/32"</td><td>.008"</td></tr> <tr><td>22.51</td><td>1/4"</td><td>5/32"</td><td>1/64"</td></tr> <tr><td>22.52</td><td>1/4"</td><td>5/32"</td><td>1/32"</td></tr> <tr><td>2.52.5</td><td>5/16"</td><td>1/8"</td><td>.008"</td></tr> <tr><td>2.521</td><td>5/16"</td><td>1/8"</td><td>1/64"</td></tr> <tr><td>2.522</td><td>5/16"</td><td>1/8"</td><td>1/32"</td></tr> <tr><td>320</td><td>3/8"</td><td>1/8"</td><td>.004"</td></tr> <tr><td>321</td><td>3/8"</td><td>1/8"</td><td>1/64"</td></tr> <tr><td>322</td><td>3/8"</td><td>1/8"</td><td>1/32"</td></tr> <tr><td>323</td><td>3/8"</td><td>1/8"</td><td>3/64"</td></tr> <tr><td>324</td><td>3/8"</td><td>1/8"</td><td>1/16"</td></tr> </tbody> </table> | Insert | I.C. | Thickness | Radius | 21.5 | 1/4" | 3/32" | .004" | 21.50.5 | 1/4" | 3/32" | .008" | 21.51 | 1/4" | 3/32" | 1/64" | 21.52 | 1/4" | 3/32" | 1/32" | 220 | 1/4" | 1/8" | .004" | 22.5 | 1/4" | 1/8" | .008" | 221 | 1/4" | 1/8" | 1/64" | 222 | 1/4" | 1/8" | 1/32" | 22.5 | 1/4" | 5/32" | .004" | 22.50.5 | 1/4" | 5/32" | .008" | 22.51 | 1/4" | 5/32" | 1/64" | 22.52 | 1/4" | 5/32" | 1/32" | 2.52.5 | 5/16" | 1/8" | .008" | 2.521 | 5/16" | 1/8" | 1/64" | 2.522 | 5/16" | 1/8" | 1/32" | 320 | 3/8" | 1/8" | .004" | 321 | 3/8" | 1/8" | 1/64" | 322 | 3/8" | 1/8" | 1/32" | 323 | 3/8" | 1/8" | 3/64" | 324 | 3/8" | 1/8" | 1/16" | <table border="1"> <thead> <tr> <th>Insert</th> <th>I.C.</th> <th>Thickness</th> <th>Radius</th> </tr> </thead> <tbody> <tr><td>330</td><td>3/8"</td><td>3/16"</td><td>.004"</td></tr> <tr><td>331</td><td>3/8"</td><td>3/16"</td><td>1/32"</td></tr> <tr><td>332</td><td>3/8"</td><td>3/16"</td><td>1/64"</td></tr> <tr><td>333</td><td>3/8"</td><td>3/16"</td><td>3/64"</td></tr> <tr><td>334</td><td>3/8"</td><td>3/16"</td><td>1/16"</td></tr> <tr><td>431</td><td>1/2"</td><td>3/16"</td><td>1/64"</td></tr> <tr><td>432</td><td>1/2"</td><td>3/16"</td><td>1/32"</td></tr> <tr><td>433</td><td>1/2"</td><td>3/16"</td><td>3/64"</td></tr> <tr><td>434</td><td>1/2"</td><td>3/16"</td><td>1/16"</td></tr> <tr><td>441</td><td>1/2"</td><td>1/4"</td><td>1/64"</td></tr> <tr><td>442</td><td>1/2"</td><td>1/4"</td><td>1/32"</td></tr> <tr><td>443</td><td>1/2"</td><td>1/4"</td><td>3/64"</td></tr> <tr><td>444</td><td>1/2"</td><td>1/4"</td><td>1/16"</td></tr> <tr><td>520</td><td>5/8"</td><td>1/8"</td><td>.004"</td></tr> <tr><td>542</td><td>5/8"</td><td>1/4"</td><td>1/32"</td></tr> <tr><td>543</td><td>5/8"</td><td>1/4"</td><td>3/64"</td></tr> <tr><td>544</td><td>5/8"</td><td>1/4"</td><td>1/16"</td></tr> <tr><td>642</td><td>3/4"</td><td>1/4"</td><td>1/32"</td></tr> <tr><td>643</td><td>3/4"</td><td>1/4"</td><td>3/64"</td></tr> <tr><td>644</td><td>3/4"</td><td>1/4"</td><td>1/16"</td></tr> <tr><td>666</td><td>3/4"</td><td>3/8"</td><td>3/32"</td></tr> </tbody> </table> | Insert | I.C. | Thickness | Radius | 330 | 3/8" | 3/16" | .004" | 331 | 3/8" | 3/16" | 1/32" | 332 | 3/8" | 3/16" | 1/64" | 333 | 3/8" | 3/16" | 3/64" | 334 | 3/8" | 3/16" | 1/16" | 431 | 1/2" | 3/16" | 1/64" | 432 | 1/2" | 3/16" | 1/32" | 433 | 1/2" | 3/16" | 3/64" | 434 | 1/2" | 3/16" | 1/16" | 441 | 1/2" | 1/4" | 1/64" | 442 | 1/2" | 1/4" | 1/32" | 443 | 1/2" | 1/4" | 3/64" | 444 | 1/2" | 1/4" | 1/16" | 520 | 5/8" | 1/8" | .004" | 542 | 5/8" | 1/4" | 1/32" | 543 | 5/8" | 1/4" | 3/64" | 544 | 5/8" | 1/4" | 1/16" | 642 | 3/4" | 1/4" | 1/32" | 643 | 3/4" | 1/4" | 3/64" | 644 | 3/4" | 1/4" | 1/16" | 666 | 3/4" | 3/8" | 3/32" |
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| Symbol | I.C. | Thickness | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | .001" | .001" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | .001" | .005" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | .001" | .001" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | .001" | .005" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | .001" | .001" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | .0005" | .001" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G | .001" | .005" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | .0005" | .001" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | .002-.004" | .005" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| U | .005-.010" | .005" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Insert | I.C. | Thickness | Radius | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21.5 | 1/4" | 3/32" | .004" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21.50.5 | 1/4" | 3/32" | .008" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21.51 | 1/4" | 3/32" | 1/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21.52 | 1/4" | 3/32" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 220 | 1/4" | 1/8" | .004" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22.5 | 1/4" | 1/8" | .008" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 221 | 1/4" | 1/8" | 1/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 222 | 1/4" | 1/8" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22.5 | 1/4" | 5/32" | .004" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22.50.5 | 1/4" | 5/32" | .008" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22.51 | 1/4" | 5/32" | 1/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22.52 | 1/4" | 5/32" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.52.5 | 5/16" | 1/8" | .008" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.521 | 5/16" | 1/8" | 1/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.522 | 5/16" | 1/8" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 320 | 3/8" | 1/8" | .004" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 321 | 3/8" | 1/8" | 1/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 322 | 3/8" | 1/8" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 323 | 3/8" | 1/8" | 3/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 324 | 3/8" | 1/8" | 1/16" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Insert | I.C. | Thickness | Radius | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 330 | 3/8" | 3/16" | .004" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 331 | 3/8" | 3/16" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 332 | 3/8" | 3/16" | 1/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 333 | 3/8" | 3/16" | 3/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 334 | 3/8" | 3/16" | 1/16" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 431 | 1/2" | 3/16" | 1/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 432 | 1/2" | 3/16" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 433 | 1/2" | 3/16" | 3/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 434 | 1/2" | 3/16" | 1/16" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 441 | 1/2" | 1/4" | 1/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 442 | 1/2" | 1/4" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 443 | 1/2" | 1/4" | 3/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 444 | 1/2" | 1/4" | 1/16" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 520 | 5/8" | 1/8" | .004" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 542 | 5/8" | 1/4" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 543 | 5/8" | 1/4" | 3/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 544 | 5/8" | 1/4" | 1/16" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 642 | 3/4" | 1/4" | 1/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 643 | 3/4" | 1/4" | 3/64" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 644 | 3/4" | 1/4" | 1/16" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 666 | 3/4" | 3/8" | 3/32" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SHAPE | TOLERANCE ± FROM NOMINAL | INSERT SIZES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* T N M G - 4 3 2

| RELIEF ANGLE | INSERT TYPES | | | |
|--------------|--------------|-------|---------|-----------|
| | Types | Hole? | C'Sink? | Chip Grv? |
| N - 0° | A | Yes | No | No |
| A - 3° | B | Yes | Yes | No |
| B - 5° | C | Yes | Yes | No |
| C - 7° | F | No | No | Yes |
| P - 11° | G | Yes | No | Yes |
| D - 15° | H | Yes | Yes | Yes |
| E - 20° | J | Yes | Yes | Yes |
| F - 25° | M | Yes | No | Yes |
| G - 30° | N | No | No | No |
| NP - 0° 10° | P | Yes | No | Yes |
| | Q | Yes | Yes | No |
| | R | No | No | Yes |
| | T | Yes | Yes | Yes |
| | U | Yes | Yes | Yes |
| | W | Yes | Yes | No |

CARBIDE GRADE CROSS-REFERENCE CHART

| Industry Code (uncoated carbide) | ISO Code | Materials to be Machined |
|----------------------------------|----------------------------|---|
| C2 | M10-20 K10-20 | General purpose grade for cast iron, non-ferrous alloys, high temperature exotics, stone, and plastics |
| C3,C4 | K01-05 | .Wear resistant grade for finishing cuts on cast iron, non-ferrous materials, high temperature exotics. |
| C5, C6 | P20-30 M20-40 | General purpose grade for steel, cast steel, malleable cast iron, 400/500 series stainless. |
| C7 | P05-15 | Light roughing to finish for steel, cast steel, malleable cast iron, 400/500 series stainless. |
| C8 | P01-10 | High speed finish grade for steel, cast steel, malleable cast iron, 400/500 series stainless |
| C2 | P15-20 M15-30 K20-30 | General purpose fine grade for steel, cast steel, alloyed cast irons, cast alloys, exotics. |
| C2 | M20-30 K15-30 | General purpose grade for roughing to finish in cast irons. |
| C2, C3 | M10-20 K10-20 | Fine grain grade for finishing of exotic iron, non-ferrous metals. |
| C5 | P20-35 | General purpose steel milling grade. |
| C1 | M30-40 K30-40 | Fine grain heavy-duty grade for roughing on iron, 200/300 series stainless steel and exotics. |
| C1 | M30-45 K30-40 | Heavy-duty grade for roughing on iron, stainless steel and exotics. |
| C2 | K05-30 | Cast iron, aluminum, non-ferrous alloys, exotics |
| C5 | P25-50 | For unfavorable conditions on steel, stainless steel. |

NOTE: Inserts with a 3 letter identification (i.e., CPG, SNG, SPG, TNG, TPG, TPU) are solid and have NO HOLE.

COATINGS

| | |
|----------|---|
| TiN | Titanium Nitride Coated-P.V.D. process - Gold color - .00015 - .00035 thick, up to 83 Rc. Lower coefficient of friction, abrasion-resistant, reduces galling, corrosion-resistant. Good for roughing, runs at high F & S. |
| TiC | Titanium Carbide Coated-C.V.D. Process - Purplish-gray color - Abrasion-resistant, cratering resistant. |
| Al2O3 | Aluminum Oxide Coating - Abrasion resistant - Good on cast iron. |
| Cermet | Composite material produced from ceramic and metal, sintered with iron group metals as a main ingredient in titanium carbide. Has wear-resistance, chip control at higher speed machining. |
| Tri-Ctg | Titanium Carbide, Aluminum Oxide 203, Titanium Nitride Coated in 3 layers. |
| Uncoated | Solid homogeneous carbide - Recommended for many non-ferrous and non-metallic applications. |