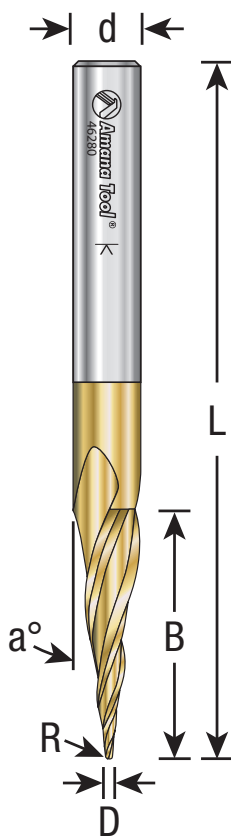


INDUSTRIAL

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit

1:1 Scale

46280



D = Tip Diameter 1/32" (.0312") Carving (Ball)

B = Max Depth of Cut 1.0"

R = Radius 1/64"

Tip Radius Tolerance ±.001"

a° = Half Angle 6.2°

d = Shank Diameter 1/4" (.2500")

L = Overall Length 3.00"

Plunge Yes

Step Down ↓ Rate (Roughing/Clearance) .062" per pass

Step Down ↓ Rate (Finishing) .003" per pass

Step Over ↔ Rate (Roughing/Clearance) .008" - .012"

Step Over ↔ Rate (Finishing) .003" per pass

of Flutes 3

RPMs 5k to 60k

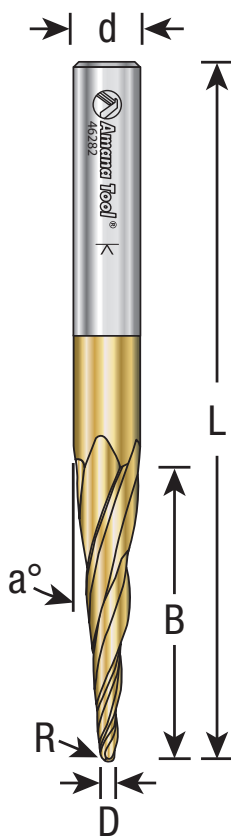
Maximum Operating RPMs 60k RPMs

INDUSTRIAL

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit

1:1 Scale

46282



D = Tip Diameter 1/16" (.0625 ") Carving (Ball)

B = Max Depth of Cut 1.060"

R = Radius 1/32"

Tip Radius Tolerance ±.001"

a° = Half Angle 5.4°

d = Shank Diameter 1/4" (.2500")

L = Overall Length 3.00"

Plunge Yes

Step Down ↓ Rate (Roughing/Clearance) .125" per pass

Step Down ↓ Rate (Finishing) .006" per pass

Step Over ↔ Rate (Roughing/Clearance) .015" - .025"

Step Over ↔ Rate (Finishing) .006" per pass

of Flutes 4

RPMs 5k to 60k

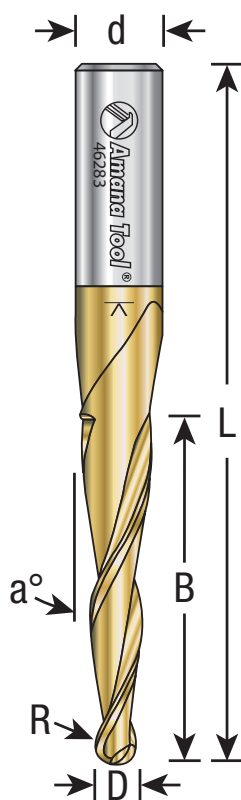
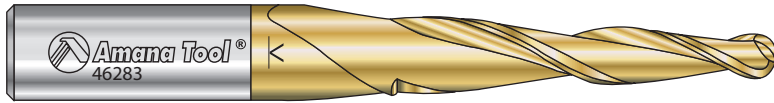
Maximum Operating RPMs 60k RPMs

INDUSTRIAL

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit

1:1 Scale

46283



D = Tip Diameter 1/4" (.2500") Carving (Ball)

B = Max Depth of Cut 2.00"

R = Radius 1/8"

Tip Radius Tolerance ±.001"

a° = Half Angle 6°

d = Shank Diameter 1/2" (.5000")

L = Overall Length 4.00"

Plunge Yes

Step Down ↓ Rate (Roughing/Clearance) .500" per pass

Step Down ↓ Rate (Finishing) .025" per pass

Step Over ↔ Rate (Roughing/Clearance) .060" - .100"

Step Over ↔ Rate (Finishing) .010" per pass

of Flutes 2

RPMs 5k to 60k

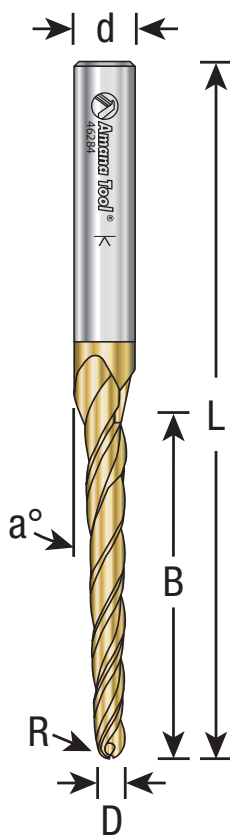
Maximum Operating RPMs 60k RPMs

INDUSTRIAL

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit

1:1 Scale

46284



D = Tip Diameter 1/8" (.1250") Carving (Ball)

B = Max Depth of Cut 1.500"

R = Radius 1/16"

Tip Radius Tolerance ±.001"

a° = Half Angle 1°

d = Shank Diameter 1/4" (.2500")

L = Overall Length 3.00"

Plunge Yes

Step Down ↓ Rate (Roughing/Clearance) .250" per pass

Step Down ↓ Rate (Finishing) .012" per pass

Step Over ↔ Rate (Roughing/Clearance) .030" - .050"

Step Over ↔ Rate (Finishing) .012" per pass

of Flutes 3

RPMs 5k to 60k

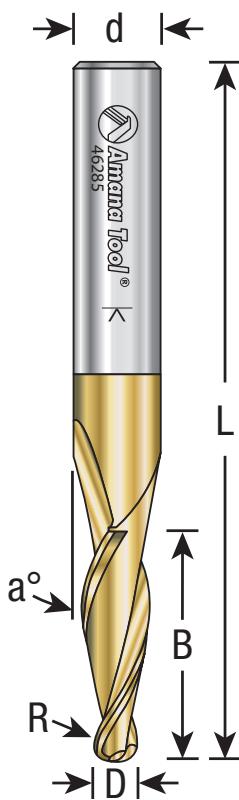
Maximum Operating RPMs 60k RPMs

INDUSTRIAL

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit

1:1 Scale

46285



D = Tip Diameter 1/4" (.2500") Carving (Ball)

B = Max Depth of Cut 1.375"

R = Radius 1/8"

Tip Radius Tolerance ±.001"

a° = Half Angle 10.0°

d = Shank Diameter 1/2" (.5000")

L = Overall Length 4.00"

Plunge Yes

Step Down ↓ Rate (Roughing/Clearance) .500" per pass

Step Down ↓ Rate (Finishing) .025" per pass

Step Over ↔ Rate (Roughing/Clearance) .060" - .100"

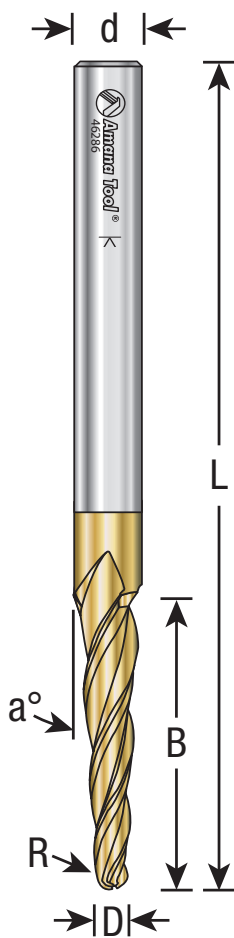
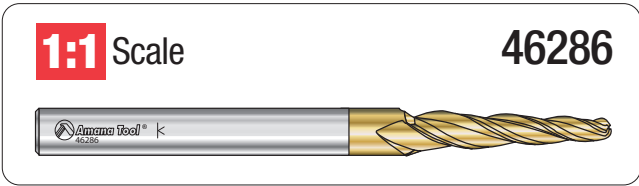
Step Over ↔ Rate (Finishing) .010" per pass

of Flutes 2

RPMs 5k to 60k

Maximum Operating RPMs 60k RPMs

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit



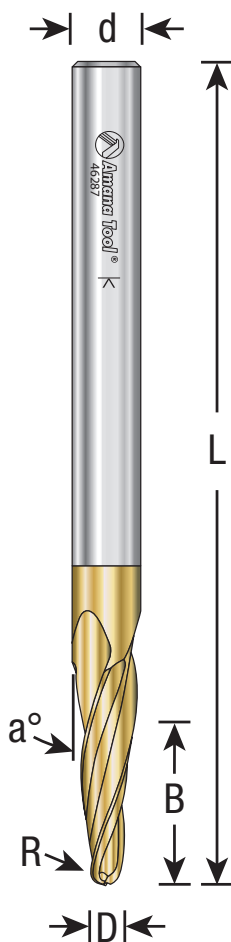
D = Tip Diameter	1/8" (.1250") Carving (Ball)
B = Max Depth of Cut	1.0"
R = Radius	1/16"
Tip Radius Tolerance	±.001"
a° = Half Angle	3.6°
d = Shank Diameter	1/4" (.2500")
L = Overall Length	3.00"
Plunge	Yes
Step Down ↓ Rate (Roughing/Clearance)	.250" per pass
Step Down ↓ Rate (Finishing)	.012" per pass
Step Over ↔ Rate (Roughing/Clearance)	.030" - .050"
Step Over ↔ Rate (Finishing)	.012" per pass
# of Flutes	3
RPMs	5k to 60k
Maximum Operating RPMs	60k RPMs

INDUSTRIAL

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit

1:1 Scale

46287



D = Tip Diameter 1/8" (.1250") Carving (Ball)

B = Max Depth of Cut .750"

R = Radius 1/16"

Tip Radius Tolerance ±.001"

a° = Half Angle 5°

d = Shank Diameter 1/4" (.2500")

L = Overall Length 3.00"

Plunge Yes

Step Down ↓ Rate (Roughing/Clearance) .250" per pass

Step Down ↓ Rate (Finishing) .012" per pass

Step Over ↔ Rate (Roughing/Clearance) .030" - .050"

Step Over ↔ Rate (Finishing) .012" per pass

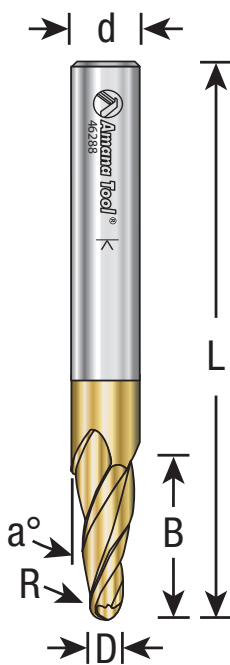
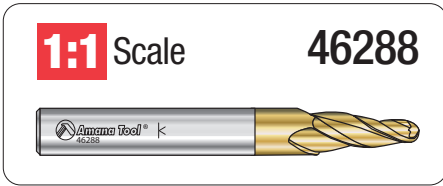
of Flutes 3

RPMs 5k to 60k

Maximum Operating RPMs 60k RPMs

INDUSTRIAL

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit



D = Tip Diameter 1/8" (.1250") Carving (Ball)

B = Max Depth of Cut .500"

R = Radius 1/16"

Tip Radius Tolerance $\pm .001$ "

a° = Half Angle 7°

d = Shank Diameter 1/4" (.2500")

L = Overall Length 3.00"

Plunge Yes

Step Down \downarrow Rate (Roughing/Clearance) .250" per pass

Step Down \downarrow Rate (Finishing) .012" per pass

Step Over \leftrightarrow Rate (Roughing/Clearance) .030" - .050"

Step Over \leftrightarrow Rate (Finishing) .012" per pass

of Flutes 3

RPMs 5k to 60k

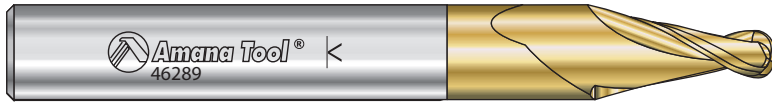
Maximum Operating RPMs 60k RPMs

INDUSTRIAL

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit

1:1 Scale

46289



D = Tip Diameter 1/4" (.2500") Carving (Ball)

B = Max Depth of Cut 1.00"

R = Radius 1/8"

Tip Radius Tolerance ±.001"

a° = Half Angle 14.0°

d = Shank Diameter 1/2" (.5000")

L = Overall Length 4.00"

Plunge Yes

Step Down ↓ Rate (Roughing/Clearance) .500" per pass

Step Down ↓ Rate (Finishing) .025" per pass

Step Over ↔ Rate (Roughing/Clearance) .060" - .100"

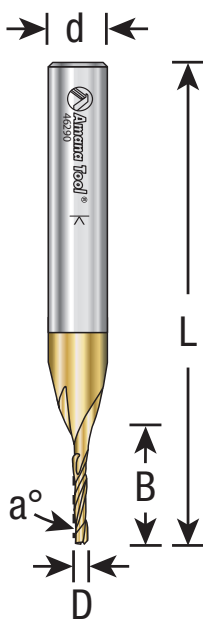
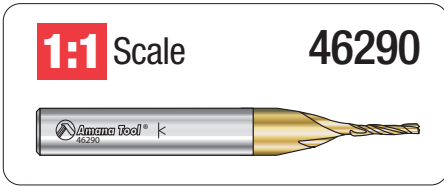
Step Over ↔ Rate (Finishing) .012" per pass

of Flutes 2

RPMs 5k to 60k

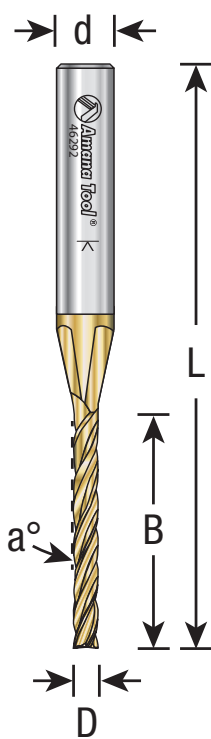
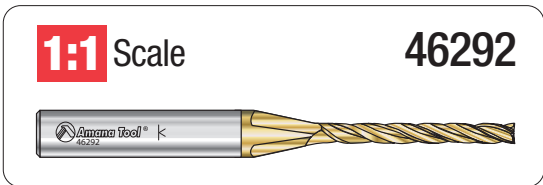
Maximum Operating RPMs 60k RPMs

ZrN Coated Solid Carbide 2D / 3D Carving Flat Bottom CNC Bit



D = Tip Diameter	1/16" (.0625") Cutting (Square End)
B = Max Depth of Cut	0.312"
Tip Radius Tolerance	$\pm .001$ "
a° = Half Angle	No Taper
d = Shank Diameter	1/4" (.2500")
L = Overall Length	2.00"
Plunge	Yes
Step Down \downarrow Rate (Roughing/Clearance)	.125" per pass
Step Down \downarrow Rate (Finishing)	.006" per pass
Step Over \leftrightarrow Rate (Roughing/Clearance)	.015" - .025"
Step Over \leftrightarrow Rate (Finishing)	.006" per pass
# of Flutes	3
RPMs	5k to 60k
Maximum Operating RPMs	60k RPMs

ZrN Coated Solid Carbide 2D / 3D Carving Flat Bottom CNC Bit



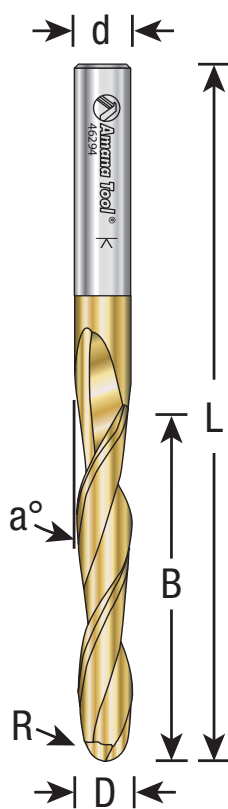
D = Tip Diameter	1/8" (.1250") Cutting (Square End)
B = Max Depth of Cut	1.093"
Tip Radius Tolerance	$\pm .001$ "
a° = Half Angle	No Taper
d = Shank Diameter	1/4" (.2500")
L = Overall Length	2.50"
Plunge	Yes
Step Down \downarrow Rate (Roughing/Clearance)	.250" per pass
Step Down \downarrow Rate (Finishing)	.012" per pass
Step Over \leftrightarrow Rate (Roughing/Clearance)	.030" - .050"
Step Over \leftrightarrow Rate (Finishing)	.012" per pass
# of Flutes	4
RPMs	5k to 60k
Maximum Operating RPMs	60k RPMs

INDUSTRIAL

ZrN Coated Solid Carbide 2D / 3D Carving Tapered Ball Nose (Conical Ball) CNC Bit

1:1 Scale

46294



D = Tip Diameter 1/4" (.2500") Carving (Ball)

B = Max Depth of Cut 1.500"

R = Radius 1/8"

Tip Radius Tolerance ±.001"

a° = Half Angle 0.10°

d = Shank Diameter 1/4" (.2500")

L = Overall Length 3.00"

Plunge Yes

Step Down ↓ Rate (Roughing/Clearance) .500" per pass

Step Down ↓ Rate (Finishing) .025" per pass

Step Over ↔ Rate (Roughing/Clearance) .060" - .100"

Step Over ↔ Rate (Finishing) .025" per pass

of Flutes 2

RPMs 5k to 60k

Maximum Operating RPMs 60k RPMs