NPA

NEW

Member IMC Group Ingersoll Cutting Tools

New Product Announcement

MILLING - SCEM

PRIMOLINE™

Cutter Series

P4M1V-_C
Cylindrical shank
P4M2V-_C
Cylindrical shank with coolant thru
P4M2V-_W
Weldon flat shank with coolant thru

Geometry

4-flute, coolant thru (Ø .250" and larger), variable pitch, variable helix

Diameter Range

.125–.750"

Depth of Cut

2xD APMX and up to 4xD LUX

Grade

IN2205 (multi-layer PVD AlTiSiN)

Lead Angle

90°

Corner Radii

Sharp – .008", .015", .030", .060", .090", .125"

Materials

☐ Stainless steel

PRIMOSSV™

NEW

Premium 4-Flute, Solid Carbide 90° End Mills – Ideal for Various Machining Operations in Stainless Steel

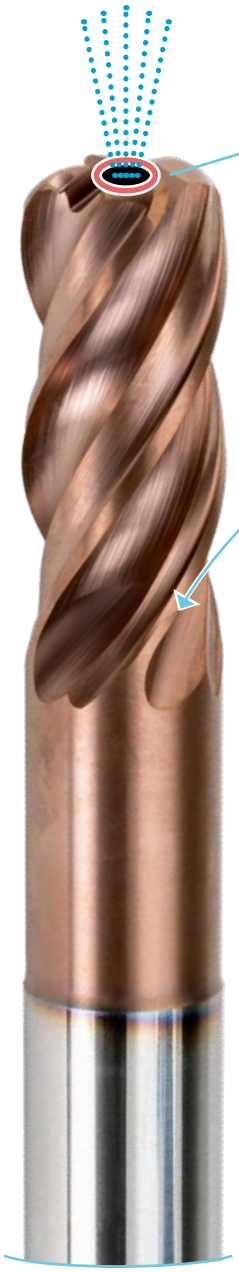
- Unique geometry with variable pitch and variable helix disrupts vibrations in long reach applications
- 2xD depth-of-cut (APMX)
- Up to 4xD usable length (LUX) provides a deep reach capability
- Coolant thru to assist with chip control and evacuation, and reduce heat

See it in action! »

ingersoll-imc.com

Overview

PrimoLine, Ingersoll's line of premium solid carbide end mills now includes **PrimoSS-V**. A new series of 4-flute end mills ideal for various machining operations in stainless steel.



Coolant Thru

Coolant helps with temperature control in the cutting area and optimal chip evacuation, resulting in a cleaner work area.

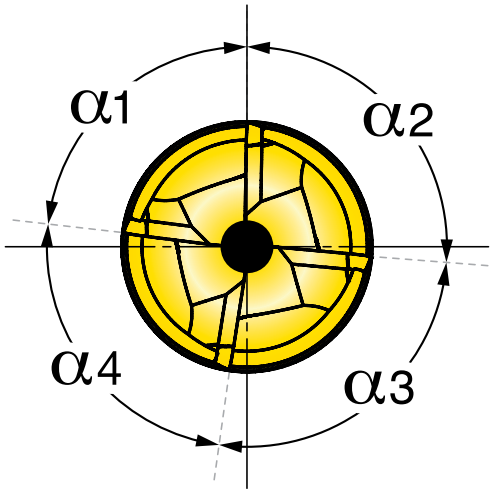
Radius to Neck Area

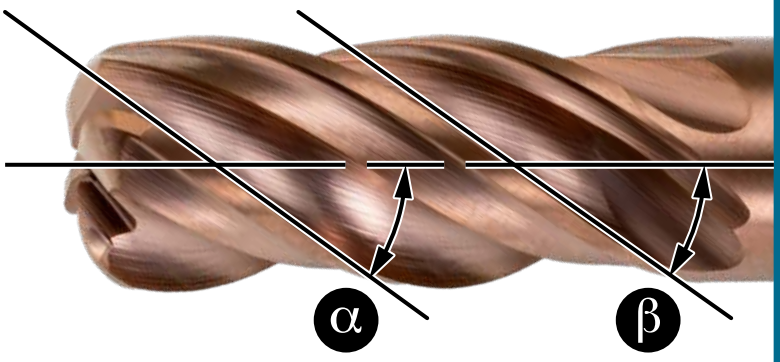
Unique feature reinforces the tool and provides a smooth blend point.

FEATURES & BENEFITS:

- Variable pitch and variable helix to assist with vibration control
- Coolant thru to assist with chip control and evacuation
- 2xD depth-of-cut (APMX)
- Up to 4xD usable length (LUX) provides a deep reach capability
- Wide variety of corner radii: .008", .015", .030", .060", .090", .125"

Variable Pitch and Variable (Different) Helix Angles





$$\alpha 1 \neq \alpha 2 \neq \alpha 3 \neq \alpha 4$$

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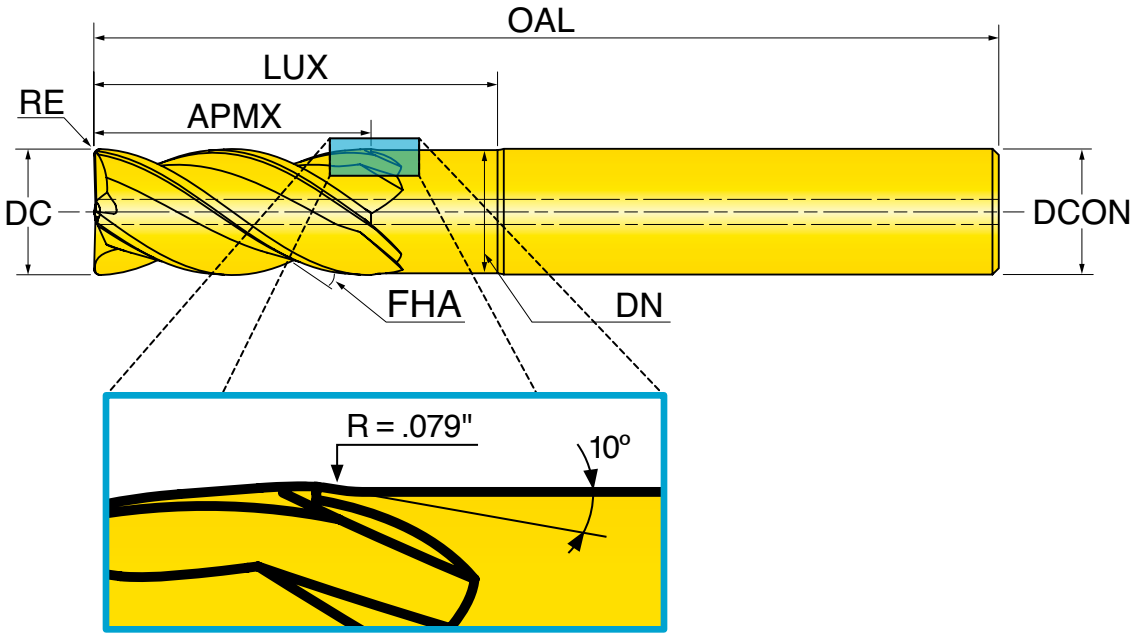
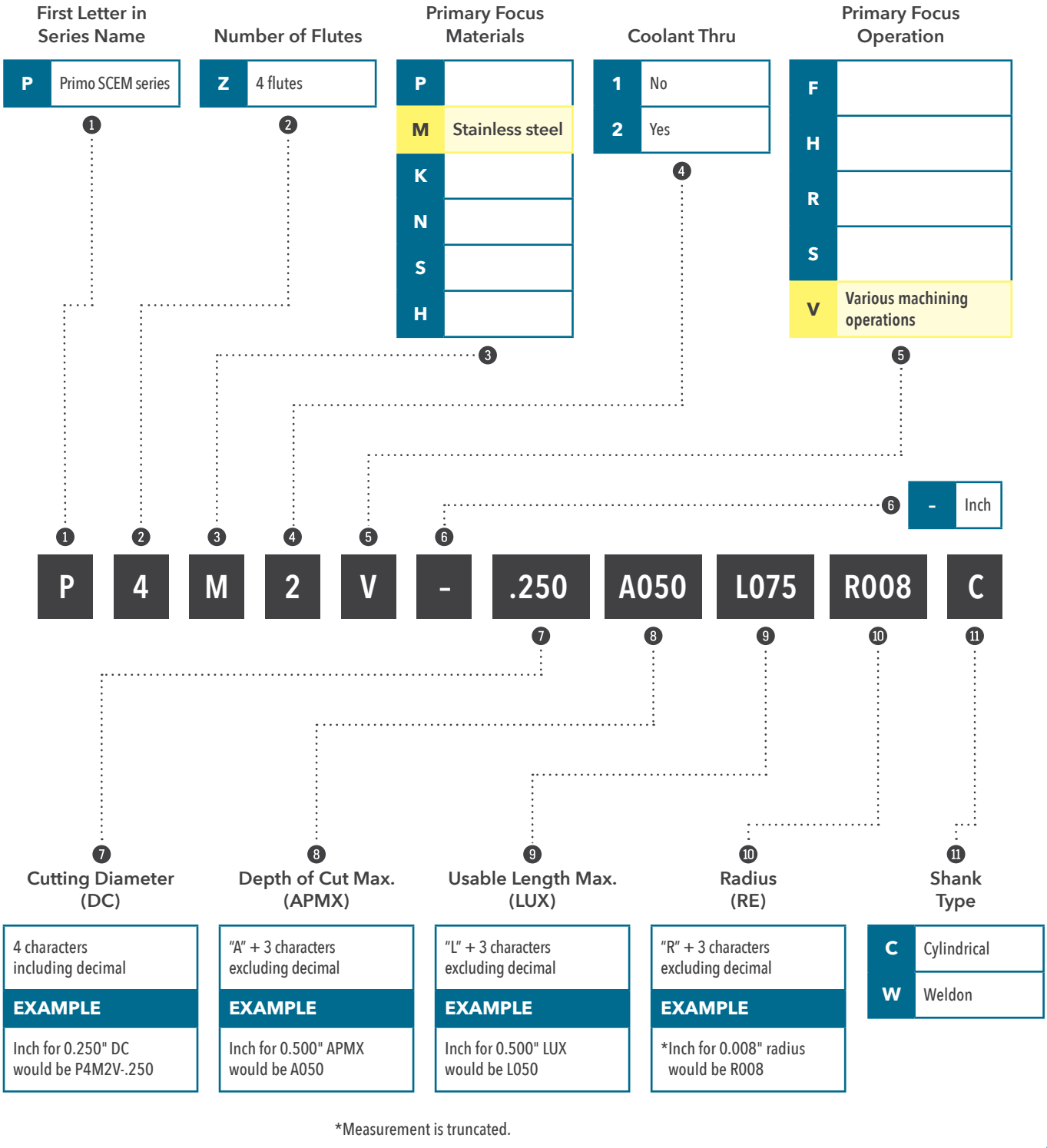
Radius to Neck Feature

Unique feature reinforces the tool and provides a smooth transition between the diameters, resulting in less deflection and smoother surface finish.



Solid Carbide End Mill (SCEM) Part Number Nomenclature

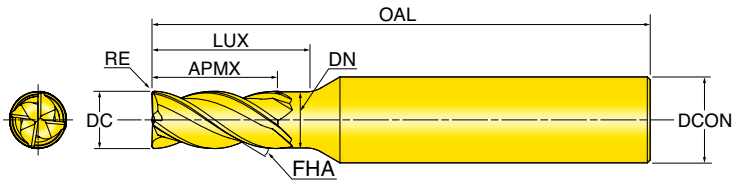


*Measurement is truncated.

Shoulder | Channel | Ramp | Pocket | Helical/ Corkscrew

Series P4M1V

4-FLUTE SCEM 90° - CYLINDRICAL

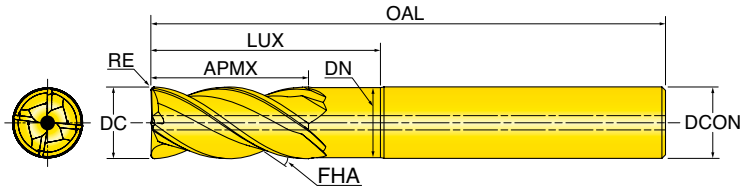


Part Number	DC Cutting Dia.	RE Corner Radius	APMX Depth of Cut Max.	LUX Usable Length Max.	ULDR Usable Length Dia. Ratio	OAL Overall Length	DN Neck Dia.	DCON Shank Dia.	RMPX Ramp Angle Max.
INCH									
P4M1V-.125A031L037R000C	0.1250	Sharp	0.312	0.375	3×	2.00	0.121	0.250	2.0
P4M1V-.125A031L050R000C	0.1250	Sharp	0.312	0.500	4×	2.13	0.121	0.250	2.0
P4M1V-.125A031L037R008C	0.1250	0.008	0.312	0.375	3×	2.00	0.121	0.250	2.0
P4M1V-.125A031L050R008C	0.1250	0.008	0.312	0.500	4×	2.13	0.121	0.250	2.0
P4M1V-.125A031L037R015C	0.1250	0.015	0.312	0.375	3×	2.00	0.121	0.250	2.0
P4M1V-.125A031L050R015C	0.1250	0.015	0.312	0.500	4×	2.13	0.121	0.250	2.0
P4M1V-.156A039L046R000C	0.1562	Sharp	0.391	0.469	3×	2.00	0.152	0.250	2.0
P4M1V-.156A039L062R000C	0.1562	Sharp	0.391	0.625	4×	2.25	0.152	0.250	2.0
P4M1V-.156A039L046R008C	0.1562	0.008	0.391	0.469	3×	2.00	0.152	0.250	2.0
P4M1V-.156A039L062R008C	0.1562	0.008	0.391	0.625	4×	2.25	0.152	0.250	2.0
P4M1V-.156A039L046R015C	0.1562	0.015	0.391	0.469	3×	2.00	0.152	0.250	2.0
P4M1V-.156A039L062R015C	0.1562	0.015	0.391	0.625	4×	2.25	0.152	0.250	2.0
P4M1V-.187A046L056R000C	0.1875	Sharp	0.469	0.563	3×	2.13	0.184	0.250	2.0
P4M1V-.187A046L075R000C	0.1875	Sharp	0.469	0.750	4×	2.25	0.184	0.250	2.0
P4M1V-.187A046L056R008C	0.1875	0.008	0.469	0.563	3×	2.13	0.184	0.250	2.0
P4M1V-.187A046L075R008C	0.1875	0.008	0.469	0.750	4×	2.25	0.184	0.250	2.0
P4M1V-.187A046L056R015C	0.1875	0.015	0.469	0.563	3×	2.13	0.184	0.250	2.0
P4M1V-.187A046L075R015C	0.1875	0.015	0.469	0.750	4×	2.25	0.184	0.250	2.0
P4M1V-.187A046L056R030C	0.1875	0.030	0.469	0.563	3×	2.13	0.184	0.250	2.0
P4M1V-.187A046L075R030C	0.1875	0.030	0.469	0.750	4×	2.25	0.184	0.250	2.0

Shoulder | Channel | Ramp | Pocket | Helical/ Corkscrew | Coolant

Series P4M2V

4-FLUTE SCEM 90° - CYLINDRICAL WITH COOLANT

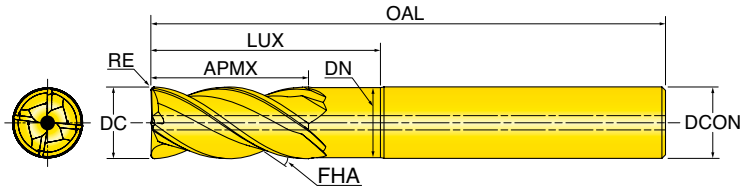


Part Number	DC Cutting Dia.	RE Corner Radius	APMX Depth of Cut Max.	LUX Usable Length Max.	ULDR Usable Length Dia. Ratio	OAL Overall Length	DN Neck Dia.	DCON Shank Dia.	RMPX Ramp Angle Max.
INCH									
P4M2V-.250A050L075R000C	0.2500	Sharp	0.500	0.750	3×	2.25	0.246	0.250	2.0
P4M2V-.250A050L100R000C	0.2500	Sharp	0.500	1.000	4×	2.50	0.246	0.250	2.0
P4M2V-.250A050L075R008C	0.2500	0.008	0.500	0.750	3×	2.25	0.246	0.250	2.0
P4M2V-.250A050L100R008C	0.2500	0.008	0.500	1.000	4×	2.50	0.246	0.250	2.0
P4M2V-.250A050L075R015C	0.2500	0.015	0.500	0.750	3×	2.25	0.246	0.250	2.0
P4M2V-.250A050L100R015C	0.2500	0.015	0.500	1.000	4×	2.50	0.246	0.250	2.0
P4M2V-.250A050L075R030C	0.2500	0.030	0.500	0.750	3×	2.25	0.246	0.250	2.0
P4M2V-.250A050L100R030C	0.2500	0.030	0.500	1.000	4×	2.50	0.246	0.250	2.0
P4M2V-.250A050L075R060C	0.2500	0.060	0.500	0.750	3×	2.25	0.246	0.250	2.0
P4M2V-.250A050L100R060C	0.2500	0.060	0.500	1.000	4×	2.50	0.246	0.250	2.0
P4M2V-.312A062L093R000C	0.3125	Sharp	0.625	0.938	3×	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R000C	0.3125	Sharp	0.625	1.250	4×	2.75	0.305	0.313	2.5
P4M2V-.312A062L093R008C	0.3125	0.008	0.625	0.938	3×	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R008C	0.3125	0.008	0.625	1.250	4×	2.75	0.305	0.313	2.5
P4M2V-.312A062L093R015C	0.3125	0.015	0.625	0.938	3×	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R015C	0.3125	0.015	0.625	1.250	4×	2.75	0.305	0.313	2.5
P4M2V-.312A062L093R030C	0.3125	0.030	0.625	0.938	3×	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R030C	0.3125	0.030	0.625	1.250	4×	2.75	0.305	0.313	2.5
P4M2V-.312A062L093R060C	0.3125	0.060	0.625	0.938	3×	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R060C	0.3125	0.060	0.625	1.250	4×	2.75	0.305	0.313	2.5

Shoulder | Channel | Ramp | Pocket | Helical/ Corkscrew | Coolant

Series P4M2V *continued*

4-FLUTE SCEM 90° - CYLINDRICAL WITH COOLANT

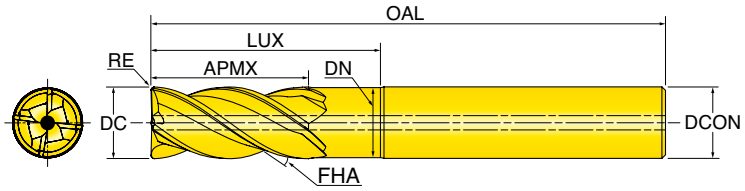


Part Number	DC Cutting Dia.	RE Corner Radius	APMX Depth of Cut Max.	LUX Usable Length Max.	ULDR Usable Length Dia. Ratio	OAL Overall Length	DN Neck Dia.	DCON Shank Dia.	RMPX Ramp Angle Max.
INCH									
P4M2V-.375A075L112R000C	0.3750	Sharp	0.750	1.125	3×	3.00	0.367	0.375	2.5
P4M2V-.375A075L150R000C	0.3750	Sharp	0.750	1.500	4×	3.25	0.367	0.375	2.5
P4M2V-.375A075L112R015C	0.3750	0.015	0.750	1.125	3×	3.00	0.367	0.375	2.5
P4M2V-.375A075L150R015C	0.3750	0.015	0.750	1.500	4×	3.25	0.367	0.375	2.5
P4M2V-.375A075L112R030C	0.3750	0.030	0.750	1.125	3×	3.00	0.367	0.375	2.5
P4M2V-.375A075L150R030C	0.3750	0.030	0.750	1.500	4×	3.25	0.367	0.375	2.5
P4M2V-.375A075L112R060C	0.3750	0.060	0.750	1.125	3×	3.00	0.367	0.375	2.5
P4M2V-.375A075L150R060C	0.3750	0.060	0.750	1.500	4×	3.25	0.367	0.375	2.5
P4M2V-.500A100L150R000C	0.5000	Sharp	1.000	1.500	3×	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R000C	0.5000	Sharp	1.000	2.000	4×	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R015C	0.5000	0.015	1.000	1.500	3×	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R015C	0.5000	0.015	1.000	2.000	4×	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R030C	0.5000	0.030	1.000	1.500	3×	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R030C	0.5000	0.030	1.000	2.000	4×	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R060C	0.5000	0.060	1.000	1.500	3×	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R060C	0.5000	0.060	1.000	2.000	4×	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R090C	0.5000	0.090	1.000	1.500	3×	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R090C	0.5000	0.090	1.000	2.000	4×	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R125C	0.5000	0.125	1.000	1.500	3×	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R125C	0.5000	0.125	1.000	2.000	4×	3.88	0.488	0.500	3.5

Shoulder | Channel | Ramp | Pocket | Helical/ Corkscrew | Coolant

Series P4M2V *continued*

4-FLUTE SCEM 90° - CYLINDRICAL WITH COOLANT

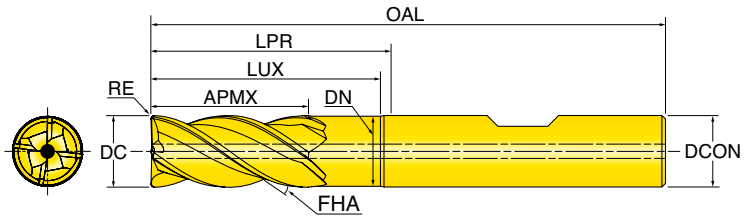


Part Number	DC Cutting Dia.	RE Corner Radius	APMX Depth of Cut Max.	LUX Usable Length Max.	ULDR Usable Length Dia. Ratio	OAL Overall Length	DN Neck Dia.	DCON Shank Dia.	RMPX Ramp Angle Max.
INCH									
P4M2V-.625A125L187R000C	0.6250	Sharp	1.250	1.875	3×	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R000C	0.6250	Sharp	1.250	2.500	4×	4.50	0.613	0.625	3.5
P4M2V-.625A125L187R015C	0.6250	0.015	1.250	1.875	3×	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R015C	0.6250	0.015	1.250	2.500	4×	4.50	0.613	0.625	3.5
P4M2V-.625A125L187R030C	0.6250	0.030	1.250	1.875	3×	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R030C	0.6250	0.030	1.250	2.500	4×	4.50	0.613	0.625	3.5
P4M2V-.625A125L187R060C	0.6250	0.060	1.250	1.875	3×	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R060C	0.6250	0.060	1.250	2.500	4×	4.50	0.613	0.625	3.5
P4M2V-.625A125L187R125C	0.6250	0.125	1.250	1.875	3×	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R125C	0.6250	0.125	1.250	2.500	4×	4.50	0.613	0.625	3.5
P4M2V-.750A150L225R000C	0.7500	Sharp	1.500	2.250	3×	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R000C	0.7500	Sharp	1.500	3.000	4×	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R015C	0.7500	0.015	1.500	2.250	3×	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R015C	0.7500	0.015	1.500	3.000	4×	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R030C	0.7500	0.030	1.500	2.250	3×	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R030C	0.7500	0.030	1.500	3.000	4×	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R060C	0.7500	0.060	1.500	2.250	3×	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R060C	0.7500	0.060	1.500	3.000	4×	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R090C	0.7500	0.090	1.500	2.250	3×	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R090C	0.7500	0.090	1.500	3.000	4×	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R125C	0.7500	0.125	1.500	2.250	3×	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R125C	0.7500	0.125	1.500	3.000	4×	5.13	0.738	0.750	3.5

Shoulder | Channel | Ramp | Pocket | Helical/ Corkscrew | Coolant

Series P4M2V

4-FLUTE SCEM 90° - WELDON WITH COOLANT



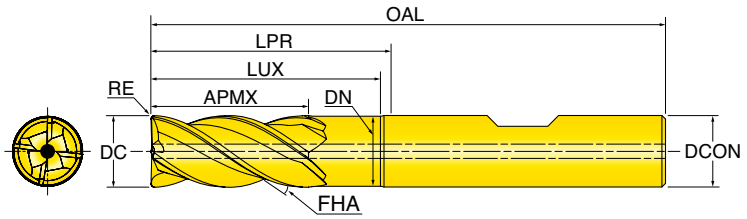
See pg 12 for Weldon flat dimensions

Part Number	DC Cutting Dia.	RE Corner Radius	APMX Depth of Cut Max.	LUX Usable Length Max.	ULDR Usable Length Dia. Ratio	LPR Proj. Length	OAL Overall Length	DN Neck Dia.	DCON Shank Dia.	RMPX Ramp Angle Max.
INCH										
P4M2V-.312A062L093R000W	0.3125	Sharp	0.625	0.938	3×	1.120	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R000W	0.3125	Sharp	0.625	1.250	4×	1.370	2.75	0.305	0.313	2.5
P4M2V-.312A062L093R008W	0.3125	0.008	0.625	0.938	3×	1.120	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R008W	0.3125	0.008	0.625	1.250	4×	1.370	2.75	0.305	0.313	2.5
P4M2V-.312A062L093R015W	0.3125	0.015	0.625	0.938	3×	1.120	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R015W	0.3125	0.015	0.625	1.250	4×	1.370	2.75	0.305	0.313	2.5
P4M2V-.312A062L093R030W	0.3125	0.030	0.625	0.938	3×	1.120	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R030W	0.3125	0.030	0.625	1.250	4×	1.370	2.75	0.305	0.313	2.5
P4M2V-.312A062L093R060W	0.3125	0.060	0.625	0.938	3×	1.120	2.50	0.305	0.313	2.5
P4M2V-.312A062L125R060W	0.3125	0.060	0.625	1.250	4×	1.370	2.75	0.305	0.313	2.5
P4M2V-.375A075L112R000W	0.3750	Sharp	0.750	1.125	3×	1.470	3.00	0.367	0.375	2.5
P4M2V-.375A075L150R000W	0.3750	Sharp	0.750	1.500	4×	1.720	3.25	0.367	0.375	2.5
P4M2V-.375A075L112R015W	0.3750	0.015	0.750	1.125	3×	1.470	3.00	0.367	0.375	2.5
P4M2V-.375A075L150R015W	0.3750	0.015	0.750	1.500	4×	1.720	3.25	0.367	0.375	2.5
P4M2V-.375A075L112R030W	0.3750	0.030	0.750	1.125	3×	1.470	3.00	0.367	0.375	2.5
P4M2V-.375A075L150R030W	0.3750	0.030	0.750	1.500	4×	1.720	3.25	0.367	0.375	2.5
P4M2V-.375A075L112R060W	0.3750	0.060	0.750	1.125	3×	1.470	3.00	0.367	0.375	2.5
P4M2V-.375A075L150R060W	0.3750	0.060	0.750	1.500	4×	1.720	3.25	0.367	0.375	2.5

Shoulder | Channel | Ramp | Pocket | Helical/ Corkscrew | Coolant

Series P4M2V *continued*

4-FLUTE SCEM 90° - WELDON WITH COOLANT



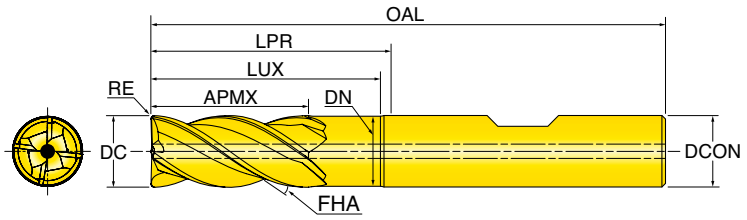
See pg 12 for Weldon flat dimensions

Part Number	DC Cutting Dia.	RE Corner Radius	APMX Depth of Cut Max.	LUX Usable Length Max.	ULDR Usable Length Dia. Ratio	LPR Proj. Length	OAL Overall Length	DN Neck Dia.	DCON Shank Dia.	RMPX Ramp Angle Max.
INCH										
P4M2V-.500A100L150R000W	0.5000	Sharp	1.000	1.500	3×	1.600	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R000W	0.5000	Sharp	1.000	2.000	4×	2.100	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R015W	0.5000	0.015	1.000	1.500	3×	1.600	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R015W	0.5000	0.015	1.000	2.000	4×	2.100	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R030W	0.5000	0.030	1.000	1.500	3×	1.600	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R030W	0.5000	0.030	1.000	2.000	4×	2.100	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R060W	0.5000	0.060	1.000	1.500	3×	1.600	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R060W	0.5000	0.060	1.000	2.000	4×	2.100	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R090W	0.5000	0.090	1.000	1.500	3×	1.600	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R090W	0.5000	0.090	1.000	2.000	4×	2.100	3.88	0.488	0.500	3.5
P4M2V-.500A100L150R125W	0.5000	0.125	1.000	1.500	3×	1.600	3.38	0.488	0.500	3.5
P4M2V-.500A100L200R125W	0.5000	0.125	1.000	2.000	4×	2.100	3.88	0.488	0.500	3.5
P4M2V-.625A125L187R000W	0.6250	Sharp	1.250	1.875	3×	2.110	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R000W	0.6250	Sharp	1.250	2.500	4×	2.610	4.50	0.613	0.625	3.5
P4M2V-.625A125L187R015W	0.6250	0.015	1.250	1.875	3×	2.110	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R015W	0.6250	0.015	1.250	2.500	4×	2.610	4.50	0.613	0.625	3.5
P4M2V-.625A125L187R030W	0.6250	0.030	1.250	1.875	3×	2.110	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R030W	0.6250	0.030	1.250	2.500	4×	2.610	4.50	0.613	0.625	3.5
P4M2V-.625A125L187R060W	0.6250	0.060	1.250	1.875	3×	2.110	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R060W	0.6250	0.060	1.250	2.500	4×	2.610	4.50	0.613	0.625	3.5
P4M2V-.625A125L187R125W	0.6250	0.125	1.250	1.875	3×	2.110	4.00	0.613	0.625	3.5
P4M2V-.625A125L250R125W	0.6250	0.125	1.250	2.500	4×	2.610	4.50	0.613	0.625	3.5

Shoulder | Channel | Ramp | Pocket | Helical/ Corkscrew | Coolant

Series P4M2V *continued*

4-FLUTE SCEM 90° - WELDON WITH COOLANT



See pg 12 for Weldon flat dimensions

Part Number	DC Cutting Dia.	RE Corner Radius	APMX Depth of Cut Max.	LUX Usable Length Max.	ULDR Usable Length Dia. Ratio	LPR Proj. Length	OAL Overall Length	DN Neck Dia.	DCON Shank Dia.	RMPX Ramp Angle Max.
INCH										
P4M2V-.750A150L225R000W	0.7500	Sharp	1.500	2.250	3×	2.490	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R000W	0.7500	Sharp	1.500	3.000	4×	3.110	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R015W	0.7500	0.015	1.500	2.250	3×	2.490	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R015W	0.7500	0.015	1.500	3.000	4×	3.110	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R030W	0.7500	0.030	1.500	2.250	3×	2.490	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R030W	0.7500	0.030	1.500	3.000	4×	3.110	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R060W	0.7500	0.060	1.500	2.250	3×	2.490	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R060W	0.7500	0.060	1.500	3.000	4×	3.110	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R090W	0.7500	0.090	1.500	2.250	3×	2.490	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R090W	0.7500	0.090	1.500	3.000	4×	3.110	5.13	0.738	0.750	3.5
P4M2V-.750A150L225R125W	0.7500	0.125	1.500	2.250	3×	2.490	4.50	0.738	0.750	3.5
P4M2V-.750A150L300R125W	0.7500	0.125	1.500	3.000	4×	3.110	5.13	0.738	0.750	3.5

Weldon Flat Dimensions

Fig. 1
Standard

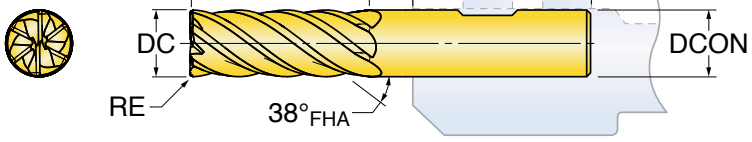
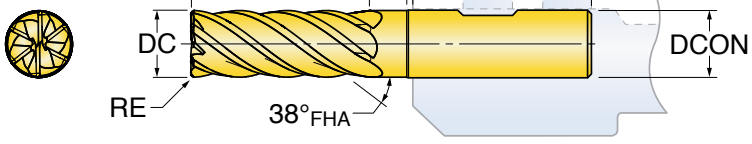
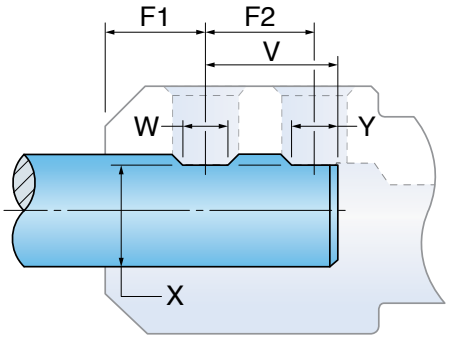


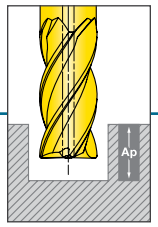
Fig. 2
Necked





DCON Diameter	Modified Weldon Flat Dimensions (inch)				F1 Nose to Center of 1st Flat	F2 1st Flat to 2nd Flat
	V	W	X	Y		
.125	-	-	-	-	.38	-
.187	-	-	-	-	.50	-
.250	.781	.187	.207	-	.38	-
.312	.781	.250	.267	-	.60	-
.375	.781	.280	.325	-	.75	-
.437	-	-	-	-	.75	-
.500	.891	.330	.440	-	.88	-
.625	.953	.400	.560	-	.94	-
.750	1.015	.455	.675	-	1.00	-
.875	1.015	.455	.810	.500	1.00	.866
1.000	1.141	.515	.925	.500	1.12	1.000
1.250	1.141	.515	1.156	.500	1.12	1.000

Operating Guidelines • Slotting

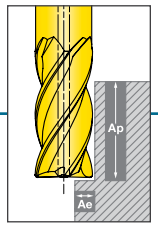


Materials				Vc Cutting Speed SFM	fz = IPT for Ap = 1xD~1.5xD								
					DC Cutting Diameter (inch)								
ISO	Material Group #VDI 3323	Type	Trade Name Examples		.125	.188	.250	.312	.375	.500	.625	.750	1.00
M	12-14	Stainless steel (austenitic & ferritic)	416, 303, 430F	295-361	.0002-.0004	.0004-.0006	.0005-.0008	.0007-.0009	.0010-.0012	.0013-.0015	.0015-.0019	.0019-.0025	.0024-.0028
		Stainless steel (austenitic & martensitic)	420, 304, 316, 440C	230-295									
		Stainless steel (PH)	15-5 PH, 17-4 PH	230-295	.0002-.0003	.0003-.0005	.0004-.0007	.0005-.0008	.0008-.0010	.0011-.0013	.0013-.0017	.0015-.0023	.0020-.0025
		Stainless steel (duplex)	Duplex 2205, 329	197-246									

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may necessitate adjustments in speed or feed. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

- High pressure coolant is highly recommended, as it will provide optimal chip evacuation and performance.
- A power milling chuck, or coolant thru (CX series) holder (for tools with Weldon flats) is highly recommended, starting at .500" DC or larger. Using a weak holder impacts performance.

Operating Guidelines • Shoulder Milling

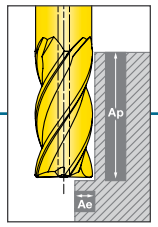


Materials				Vc Cutting Speed SFM	fz = IPT for Ae = .3xD~.4xD • Ap = 1.5xD								
					DC Cutting Diameter (inch)								
ISO	Material Group #VDI 3323	Type	Trade Name Examples		.125	.188	.250	.312	.375	.500	.625	.750	1.00
M	12-14	Stainless steel (austenitic & ferritic)	416, 303, 430F	394-426	.0002-.0004	.0004-.0006	.0005-.0008	.0007-.0009	.0010-.0012	.0013-.0015	.0015-.0019	.0019-.0025	.0030-.0034
		Stainless steel (austenitic & martensitic)	420, 304, 316, 440C	262-361									
		Stainless steel (PH)	15-5 PH, 17-4 PH	225-325	.0002-.0003	.0003-.0005	.0004-.0007	.0005-.0008	.0008-.0010	.0011-.0013	.0013-.0017	.0015-.0023	.0024-.0028
		Stainless steel (duplex)	Duplex 2205, 329	197-246									

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may necessitate adjustments in speed or feed. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

- High pressure coolant is highly recommended, as it will provide optimal chip evacuation and performance.
- A power milling chuck, or coolant thru (CX series) holder (for tools with Weldon flats) is highly recommended, starting at .500" DC or larger. Using a weak holder impacts performance.

Operating Guidelines • HEM / Finish Milling



Materials				Vc Cutting Speed SFM	*fz = IPT for Ae = .05xD~.15xD • Ap = 2xD								
					DC Cutting Diameter (inch)								
ISO	Material Group #VDI 3323	Type	Trade Name Examples		.125	.188	.250	.312	.375	.500	.625	.750	1.00
M	12-14	Stainless steel (austenitic & ferritic)	416, 303, 430F	590-787	.0009-.0017	.0011-.0021	.0014-.0027	.0017-.0035	.0023-.0047	.0027-.0059	.0039-.0071	.0047-.0098	.0057-.0115
		Stainless steel (austenitic & martensitic)	420, 304, 316, 440C	415-649									
		Stainless steel (PH)	15-5 PH, 17-4 PH	375-531	.0009-.0019	.0012-.0025	.0015-.0033	.0023-.0044	.0027-.0055	.0039-.0065	.0047-.0091	.0057-.0104	.0057-.0104
		Stainless steel (duplex)	Duplex 2205, 329	197-374									

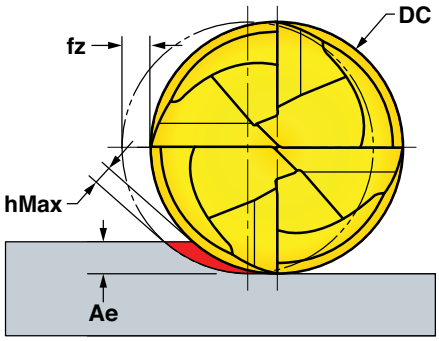
- As Ap increases to maximum 2xD and for finish milling, use fz from lower end of chart.
- When Ae< .10xD, use speed from the higher end of chart.

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may necessitate adjustments in speed or feed. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

***fz = chip thinning calculations are included in the chip load above, especially when Ae ≤ .15xD.**

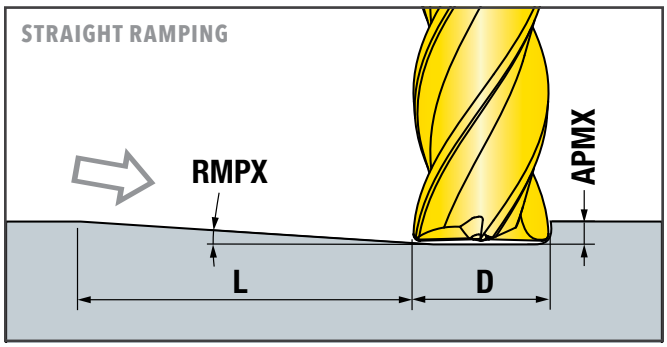
- High pressure coolant is highly recommended, as it will provide optimal chip evacuation and performance.
- A power milling chuck, or coolant thru (CX series) holder (for tools with Weldon flats) is highly recommended, starting at .500" DC or larger. Using a weak holder impacts performance.

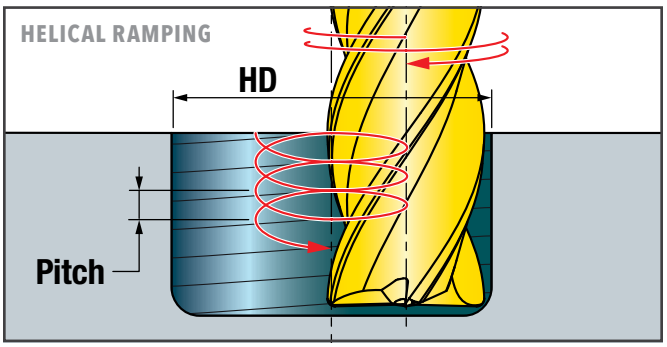
Chip Thinning



- Due to the lower radial engagement, *chip thinning* is accentuated, and a much higher feed-per-tooth (fz) can be applied in order to arrive at the true chip thickness (hMax).
- When Ae ≤ .25xD, recommend use of **Chip Thinning Calculator** ▶ to ensure hMax is within fz range.
- If needed, Chip Thinning Calculator can be found on our website Machining App.

Ramping Guidelines





DC Cutter Dia.	STRAIGHT RAMPING			HELICAL RAMPING • 4-FLUTE													
	RPMX Ramp Angle Max.	APMX Depth of Cut at .75xD	L Ramp Length Min.	HD Hole Diameter Max.							Pitch Max.						
				*Sharp	*R .008"	*R .015"	R .030"	R .060"	R .090"	R .125"	*Sharp	*R .008"	*R .015"	R .030"	R .060"	R .090"	R .125"
.125	2.0	.094	2.7	.238	.222	.209	-	-	-	-	.012	.011	.009	-	-	-	-
.156	2.0	.117	3.4	.297	.282	.268	-	-	-	-	.015	.014	.012	-	-	-	-
.188	2.0	.141	4.0	.356	.341	.328	.299	-	-	-	.019	.017	.015	.012	-	-	-
.250	2.0	.188	5.4	.475	.460	.447	.418	.361	-	-	.025	.023	.022	.018	.012	-	-
.313	2.5	.234	5.4	.594	.579	.565	.537	.480	-	-	.039	.036	.035	.031	.023	-	-
.375	2.5	.281	6.4	.713	-	.684	.656	.599	-	-	.046	-	.042	.038	.031	-	-
.500	3.5	.375	6.1	.950	-	.922	.893	.836	.779	.713	.086	-	.081	.075	.064	.054	.041
.625	3.5	.469	7.7	1.188	-	1.159	1.131	1.074	-	.950	.108	-	.102	.097	.086	-	.062
.750	3.5	.563	9.2	1.425	-	1.397	1.368	1.311	1.254	1.188	.129	-	.124	.119	.108	.097	.084

*Reduce ramp angle and feed when using sharp corner and small corner radius.

HD = Hole Diameter Max. formula when Helical Ramping	
EXAMPLES	
P4M2V-.500A100L150R030C	P4M2V-.750A150L300R125W
DC = .500" with RE = .03"	DC = .750" with RE = .125"
HD = ((DC-(1 x RE)) x 1.9)	HD = ((DC-(1 x RE)) x 1.9)
HD = ((.500-(1 x .03)) x 1.9)	HD = ((.750-(1 x .125)) x 1.9)
HD = .893	HD = 1.188