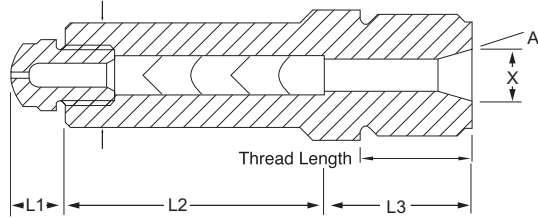


Mixing Nozzles



Iso Mix

1 1/2" or 1 3/4" Body diameter



Standard Removable tip or oversize tip for larger applications.

What it does

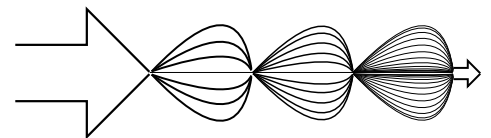
The MOTIONLESS MIX NOZZLE incorporates the Motionless Inline Mixing elements. 4, 5 or 6 Stainless Steel elements are inserted in a special Nozzle recess. These elements offer mathematically predictable layer generation resulting in superior melt mixing. Less dry coloring or color concentrate is required to obtain uniform dispersion. In addition, a more homogenous melt results. Quick pay-back is realized in savings of color concentrate and/or dry coloring and faster cycling due to lower average melt temperature.

Mixing Principle

The MOTIONLESS Mix consists of a series of mixing elements enclosed in a specially machine Nozzle Body. There are no moving parts and elements can easily be removed for cleaning. Element ends are shaped such that adjacent elements form a tetrahedral chamber. Four (4) holes bored in each element are at oblique angles so that material near the periphery on the inlet side of the element emerges near the center on the outlet side. Because of this unique concept, the average 5-element assembly will provide 1,024 (6 elements = 4,096) generated layers in the mixing process at point of ejection. This concept is considerably advanced over the older style nozzle mixers incorporating a series of blending devices (more appropriate for low pressure applications).

Advantages

Advantages are numerous; however, those most pertinent to the average injection molder include considerable savings on cost of dry coloring and/or color concentrate and faster cycle times. Savings in dry coloring and color concentrates average 10% to 20% in screw type machine applications. Faster cycling results from thermally more homogenous melt stream and faster screw recovery time (much of the mixing requirements is attended to by the nozzle, requiring less mixing by the screw). Due to smooth flow path and no mixing parts, the nozzle is entirely reliable and provides negligible restriction to material flow.



▼ Requires 1 3/4" nozzle body diameter and "KN" Series tip

Configuration	dia. of elements	x-section of flow	Equivalent Orifice	Application
Style A -5 elements 1 1/2" Body	5/8"	.038 sq in	.22"	For small machines or medium sized machines working at less than capacity on common materials. Best with color concentrate or color compound.
Style B -6 elements 1 1/2" Body	5/8"	.038 sq in	.22"	For small and medium sized machines molding dry color, or where there is ample injection pressure reserve and maximum dispersion required.
Style C -5 elements 1 1/2" Body	1 1/16"	.062 sq in	.28"	For medium and large machines molding color concentrate or color compound. There is relatively little pressure drop with this style.
Style D -6 elements 1 1/2" Body	1 1/16"	.062 sq in	.28"	For medium and large machines molding dry color or where absolute maximum dispersion is required.
Style E▼ -5 elements 1 3/4" Body	1"	.093 sq in	.34"	For the most demanding applications, such as large shots being injected rapidly, high hourly throughput, or where minimum pressure drop can be tolerated.
Style F▼ -6 elements 1 3/4" Body	1"	.093 sq in	.34"	For the most demanding applications, maximum mixing action and minimum pressure drop.

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Northern Supply (800-365-6565) • Nickerson Machinery (800-821-9534) • OHS (Ontario-888-809-7050/Quebec-888-475-9224)

B

Mixing Nozzles

Iso Mix

Forced radial mixing is one of the fundamental reasons for the superior performance of the MOTIONLESS MIX NOZZLE. Figures on the left show that outer streams 1 & 4 emerge on the inside, whereas inner streams 2 & 3 migrate to the outside. The process is repeated as material flows into a tetrahedral cross section between elements resulting in positive cross blending of any temperature and color gradients in the polymer melt stream.

Number of layers generated in Mix Nozzle, using different numbers of elements and single flow stream

Elements	1	2	3	4	5	6
Layers generated	4	16	64	256	1024	4095

Dimensions & Ordering Data

The minimum length of a motionless-MIX Nozzle is dependent on:

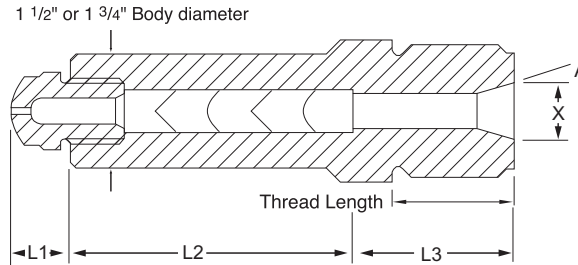
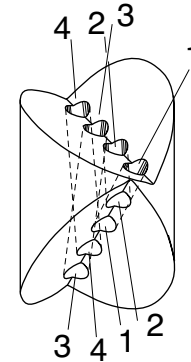
1. THE LENGTH OF MIXING ELEMENTS.
2. THE REAR OPENING DIAMETER AND ENTRY ANGLE
3. NOZZLE TIP LENGTH.

The Following information will help you with your selection, however we suggest that you call our technical sales line.

Please be prepared with information on:

- Thread Size
- Minimum and maximum length of nozzle
- Rear Opening
- Tip radius and orifice required

View of MIX-element



L1 = Tip Length .75" standard
(1.1" for style E KN tip)

$$L3 = \frac{X - 0.5 \times \text{Cotangent } A + .5}{2}$$

For an indication of minimum overall length, simply calculate L3, select and add element length L2 and add tip length, L1.

For example:

A nozzle with a rear opening of .75" (X)
Entry angle of 10 degrees (A)
Element type "C"
Tip length .75"

$$L1 = 0.75"$$

$$L2 = 4.06"$$

$$L3 = \frac{(.75 - .5 \times 5.671) + .5}{2} = 1.209"$$

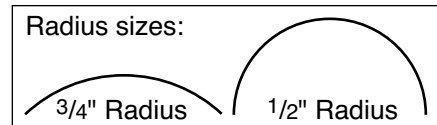
$$\text{Nozzle length} = 0.75 + 4.06 + 1.209 = 6.02"$$

The required minimum length of nozzle assembly is 7" (The next length longer than 6.82")

Typical rear opening angles and respective cotangents are:

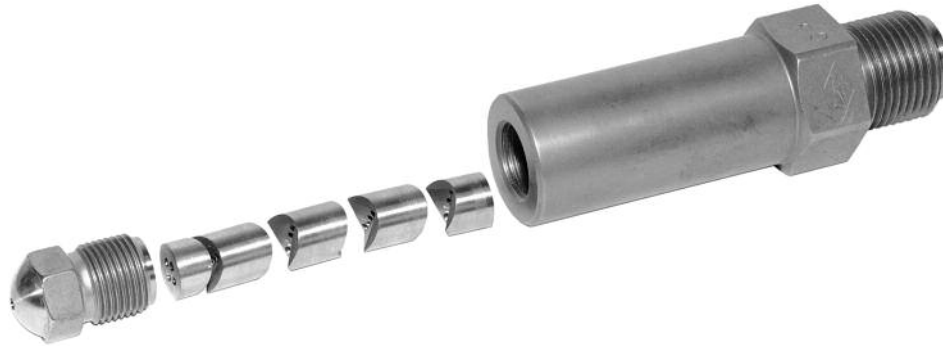
Degrees	=	Cotangent
10	=	5.671
15	=	3.732
30	=	1.732

Style	Length of elements	L2
A	2.63	3.37
B	3.25	4.00
C	3.31	4.06
D	4.06	4.81
E	4.22	4.88
F	5.22	5.88



Mixing Nozzles

Iso Mix



B

Prices: includes--Nozzle body, Tip(gen. purpose) & Full set of elements

Element Diameter			5/8"		13/16"		1"	
# of Elements			5	6	5	6	5	6
Thread	OAL	Part#	Style A	Style B	Style C	Style D	Style E*	Style F*
Up to 2" (50mm) dia.	6"	MN50▼6	\$403	\$445	\$418	--	--	--
	8"	MN50▼8	\$440	\$482	\$455	\$496	\$534	\$582
	10"	MN50▼10	\$479	\$521	\$493	\$534	\$572	\$620
	12"	MN50▼12	\$500	\$542	\$516	\$557	\$594	\$642
2 1/2" x 2 3/4" (51 x 69mm) dia.	6"	MN51▼6	\$443	\$481	\$457	\$498	--	--
	8"	MN51▼8	\$482	\$521	\$497	\$498	\$576	\$624
	10"	MN51▼10	\$522	\$560	\$536	\$577	\$616	\$664
	12"	MN51▼12	\$569	\$542	\$583	\$624	\$662	\$710
Larger than 2 3/4" (70mm) dia.	6"	MN70▼6	\$493	\$532	\$508	\$548	--	--
	8"	MN70▼8	\$538	\$576	\$552	\$593	\$631	\$679
	10"	MN70▼10	\$582	\$620	\$596	\$637	\$676	\$724
	12"	MN70▼12	\$631	\$670	\$647	\$688	\$726	\$774

To Complete Part#:
Replace ▼ with the specific Style letter (A,B,C, ...etc.) of the desired nozzle setup

NOTE: ALL PRICES ARE IN CANADIAN DOLLARS!

***Requires 1 1/4" nozzle body diameter & KN series tips**



Options and Spares:

1. Thermocouple hole on hex flat \$8.00
2. Replacement MOTIONLESS - Mix Elements (full set)

	Part No.	1-3 Sets	4 + Sets
Style A (5 elements 5/8" dia.)	ISOMXA	\$239.00	\$231.83
Style B (6 elements 5/8" dia.)	ISOMXB	\$287.00	\$278.39
Style C (5 elements 13/16" dia.)	ISOMXC	\$232.00	\$225.04
Style D (6 elements 13/16" dia.)	ISOMXD	\$280.00	\$271.60
Style E (5 elements 1" dia.)	ISOMXE	\$250.00	\$242.50
Style F (6 elements 1" dia.)	ISOMXF	\$301.00	\$291.97

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