Ashby Cross
Dispensing Solutions Since 1974

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SELECTING A STATIC MIXER

A practical guide to sizing and specifying disposable mixers for two-component adhesives

What a static mixer does

A static mixer — also called a motionless mixer — blends two fluid components as they flow through a tube of fixed helical elements. There are no moving parts to wear, adjust, or clean: as the two components are forced through the mixer, the elements repeatedly divide and recombine the stream until it leaves as a uniform, homogeneous mixture.

Compared with scooping components into a cup and hand-mixing, a static mixer delivers a consistent mix every shot, eliminates the air that hand-mixing whips into the material (air means voids in the cured bond line, and voids mean bond failures), and removes the waste, exposure, and process variation of open-cup work. The mixer is disposable — when its work life is spent, it is replaced, not cleaned.

Static mixers are used two ways: on a cartridge with a handheld dispenser, or as the final mixing stage of meter/mix/dispense (MM&D) equipment. The selection logic below applies to both.

The four decisions in every mixer selection

1. **Connection type:** what the mixer screws onto — the bell inlet of an MM&D dispense valve or manifold, or the outlet of a dual-barrel cartridge. The two housing families (large bell and small bell) are not interchangeable, so identify the connection first.
2. **Bore (inside diameter):** the inside diameter of the element housing. Bore sets the flow rate the mixer can pass and, just as importantly, the pressure it can withstand — smaller bores carry higher pressure ratings. Bore sizes are coded in the part number (see below).
3. **Number of elements:** more elements mix more thoroughly but cost pressure and retained volume. The right count is driven by the mix ratio and by how different the two components' viscosities are — a 1:1 pair of similar fluids needs far fewer elements than a 10:1 pair with a thin catalyst.
4. **Outlet type:** what the mixed adhesive leaves through — a plain tapered tip, a luer-lock for needles and fine tips, a barbed outlet for tubing, or a specialty attachment. The outlet must suit what you are dispensing into.

The checks behind the choice

Mixer volume vs. shot size

Every mixer holds a volume of mixed material, and that volume is waste at every change. An MS312-32, for example, retains about 11.5 ml — a sound choice for 50 ml shots, but a poor one for a 6 ml shot, where the right answer is a smaller-bore mixer. As a rule, the mixer should hold well under your smallest shot.

Ratio and viscosity spread

The harder the mixing job, the more elements it takes. Wide mix ratios (4:1, 10:1) and large viscosity differences between the components call for more elements — and at high ratios, center-injection mixers, which introduce the minor component at the center of the stream instead of the wall, mix measurably better. Part numbers carry a CI suffix for this style.

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Pressure — rating, shroud, and element material

Pressure rating falls as bore grows. For 32-element mixers: the 5 mm bore is rated 33 bar, the 8 mm bore 27 bar, and the 13 mm bore 17 bar. Two safeguards apply when system pressure runs high:

- **Shroud:** An aluminum safety shroud threads over the mixer. It protects against a mixer letting go above its rating, and it also keeps the components from bypassing the elements and streamlining down the inner wall, which quietly ruins mix quality. A shroud can also help position the mixer in the application and in heated setups.
- **Element material:** At high pressures, polyacetal elements replace polypropylene — they hold their geometry where standard elements would deform.

Work life and curing in the tube

Mixed adhesive cures inside the mixer. Pauses in dispensing let material harden in the tube, narrowing the effective diameter and changing the mix — so the mixer's work-life match to your process matters as much as its size. If your process pauses often, weigh running a purge cycle against simply changing mixers more often; both are legitimate strategies, and the cheaper one depends on your shot pattern.

Reach and air

Some applications need the adhesive delivered at the bottom of a deep hole or cavity — filling from the bottom up so air is pushed out rather than trapped. Extension mixers, bent tips, and flexible tubing attachments exist for exactly this, as do luer-lock adapters for fine dispensing tips.

Reading an Ashby mixer part number

Mixer part numbers are descriptive once you know the code: family + bore + element count, plus a suffix for outlet or style.

Part number	Family	Bore	Elements	Meaning
MS188-32	MS — large bell	188 = 0.188" (5 mm)	32	Standard MMD mixer, fine bore, high element count
DM312-24	DM — small bell	312 = 0.312" (8 mm)	24	Small-bell version of the same element geometry
MS375-24LL	MS — large bell	375 = 0.375" (10 mm)	24	LL suffix — luer-lock outlet
MS500-24	MS — large bell	500 = 0.50" (13 mm)	24	Largest bore — highest flow, lowest pressure rating
DM500-12DS	DM — Large bell	500 = 0.50" (13 mm)	12	DS suffix — dynamic (rotary) mixer, see below

Bore code	188	250	312	375	500
Bore (ID)	5 mm	6.4 mm	8 mm	10 mm	13 mm
Max pressure, 32 elements	33 bar	30 bar	27 bar	22 bar	17 bar

Other suffixes: B6 = 3/8" barb outlet; CI = center injection for 4:1 and 10:1 ratios. Cartridge mixers follow the same logic in cartridge families (bayonet and F-style connections, including Quadro-geometry elements for high-ratio cartridges).

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When a static mixer is not enough

Some materials defeat static mixing: foams, optically clear products where any streak shows, and combinations with extreme differences in both viscosity and mix ratio. For those, Ashby Cross specifies dynamic (rotary) mixing — a powered rotating element (the DS series, paired with a Dyna-Stat mixing head) that does the blending work actively instead of relying on flow division alone. If a static mixer is producing streaks or incomplete cure on a difficult material, that is the next step, not more elements.

Testing confirms the specification

Catalog selection narrows the field; testing settles it. Viscosity, specific gravity, flow rate, work life, gel time, temperature, and humidity all move the result, so the final element count and bore should be proven under your actual operating conditions — including pauses, temperature swings, and the attachments you will really use. Adhesive manufacturers publish work-life and cure data under their own test conditions; your process is the deciding test.

That is why every Ashby Cross MM&D system is wet-tested before shipment, and its mixer specification confirmed at that test at no charge. A mixer part number in one of our quotations marked “to be confirmed at wet test” is a deliberate step, not a gap.

Requesting samples — what to tell us

To recommend or sample the right mixer, we need two short lists. The mixer itself:

- Connection type — what it is connecting to (valve, manifold, or cartridge)
- Bore / inside diameter, or the flow rate you need
- Element count, if you have a current mixer that is close
- Outlet type — what you are dispensing into

And the job it has to do:

- Material and supplier, with the mix ratio (stated by volume or by weight)
- Component viscosities and specific gravities
- Shot size (or bead size) and dispense rate
- Work life, and how often dispensing pauses

Full mixer catalog: ashbycross.com/StaticMixers.htm

The Ashby Cross offer

Selecting the correct mixer from hundreds of styles can be overwhelming if you have not done it before — we do it every day. Ashby Cross will gladly assist you in selecting the best static mixer for your application, and a static mixer specification is included at no charge with any Ashby Cross meter/mix/dispense system.

Ask about the Ashby Cross Preferred Partners program for static mixers and other consumable supplies, offered to Ashby Cross equipment customers: place a blanket order with quarterly, monthly, or bi-weekly scheduled releases for a minimum of six months and receive special pricing, locked for the length of the blanket. We store your inventory and ship it as you need it — your shelf space and your working capital stay free.