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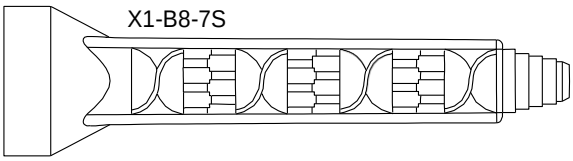
Reference Guide

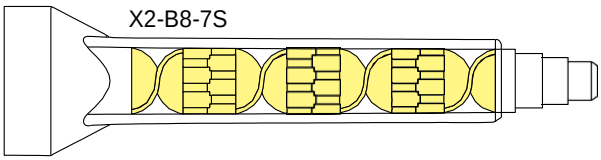
xemex®

January 2022

X1-B8-7S



X2-B8-7S



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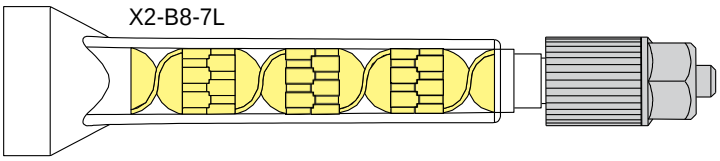

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Products

xemex®

January 2022

Re mixers™

Product Line

xemex®

(zeˈmeks)

	X1-B8-7S	X2-B8-7S	X2-B8-7L
Insert Material	Nylon	Polyester	Polyester
Housing Material	Polypropylene	Polypropylene	Polypropylene
Connection	Bell - Straight	Bell - Straight	Bell - Straight
Nozzle Tip	Stepped	Stepped (Adaptable)	Luer-Lock
Assembly (N)	7 elements	7 elements	7 elements
Retained Volume	2.5 mL	2.5 mL	2.7 mL
Total Length	75 mm	78 mm	90 mm
Inner Diameter	8.7 mm	8.7 mm	8.7 mm
Ratios Served	1:1, 2:1, 4:1, 10:1	1:1, 2:1, 4:1, 10:1	1:1, 2:1, 4:1, 10:1
Systems Served	Cartridge & Meter-Mixing	Cartridge & Meter-Mixing	Cartridge & Meter-Mixing

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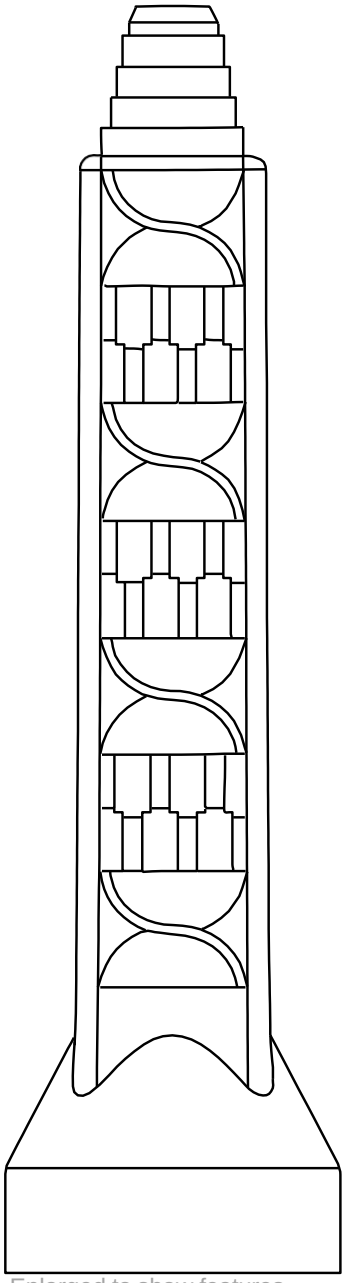
SKU: X1-B8-7S

Technical Datasheet

xemex®

(zeˈmeks)



Enlarged to show features

Xemex is a revolutionary new mixing technology for two-part adhesives. Unlike existing nozzles that rely on 2x-mixing per element, Xemex is the only mixer to achieve 10x-mixing per element. This allows Xemex to provide optimal mixing in only seven elements.

Xemex's shorter profile provides immediate savings in lost adhesive while bringing applications closer to your work surface. Contact Royal 4.0 to see how Xemex can help your manufacturing processes.

Features

- Patented Xemex mixing technology
- Bell connection for cartridge & meter-mix systems
- Made in the USA, ensuring quality & stock availability

Benefits

- Improves mixing and adhesive performance
- Simplifies floor management. One mixer SKU to dispense:
  - Epoxies, Acrylics, Silicones, and Urethanes
  - A wide range of mix ratios (1:1, 2:1, 4:1, 10:1)
- Significantly reduces retained adhesive loss
- Eliminates bubbling and air-entrapment issues
- Improves ergonomics & dexterity for manual dispensing
- Increases meter-mixing accuracy & system clearances

Specifications

Insert Material:	Polyamide - White
Housing Material:	Polypropylene
Connection:	Bell - Straight
Nozzle Tip:	Stepped
Insert Size:	7 Elements
Retained Volume:	2.5 mL
Total Length:	75 mm
Inner Diameter:	8.7 mm
Ratios Served:	1:1, 2:1, 4:1, 10:1
Systems Served:	Cartridge & Meter-Mixing

SKU: X2-B8-7S

Technical Datasheet

xemex®

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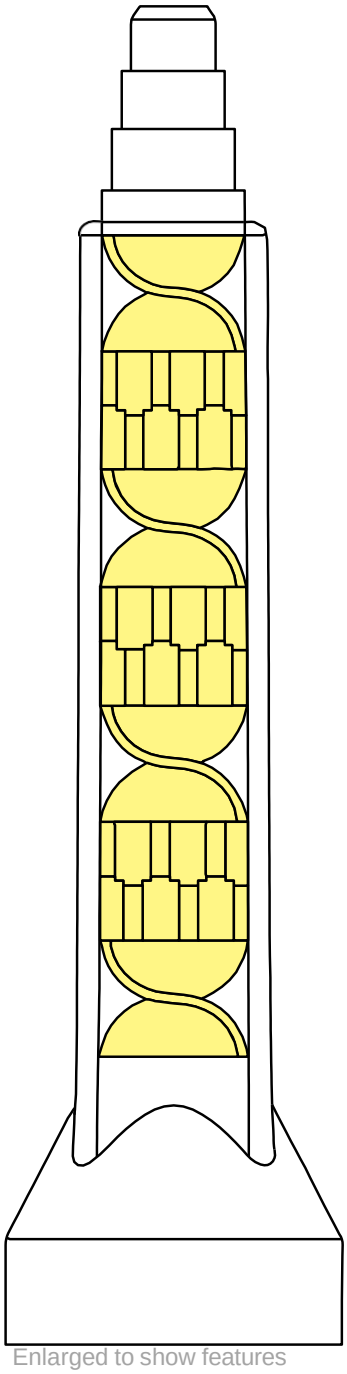

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Features

- Patented Xemex mixing technology
- Bell connection for cartridge & meter-mix systems
- Stepped (luer-adaptable) tip for precision & modularity
- Hydrophobic inserts for moisture-sensitive formulations
- Made in the USA, ensuring quality & stock availability

Benefits

- Improves mixing and adhesive performance
- Simplifies floor management. One mixer SKU to dispense:
  - Epoxies, Acrylics, Silicones, and Urethanes
  - A wide range of mix ratios (1:1, 2:1, 4:1, 10:1)
- Significantly reduces retained adhesive loss
- Eliminates bubbling and air-entrapment issues
- Improves ergonomics & dexterity for manual dispensing
- Increases meter-mixing accuracy & system clearances

Specifications

Insert Material:	Polyester - Yellow
Housing Material:	Polypropylene
Connection:	Bell - Straight
Nozzle Tip:	Stepped (luer-adaptable)
Insert Size:	7 Elements
Retained Volume:	2.5 mL
Total Length:	78 mm
Inner Diameter:	8.7 mm
Ratios Served:	1:1, 2:1, 4:1, 10:1
Systems Served:	Cartridge & Meter-Mixing

Technical Datasheet

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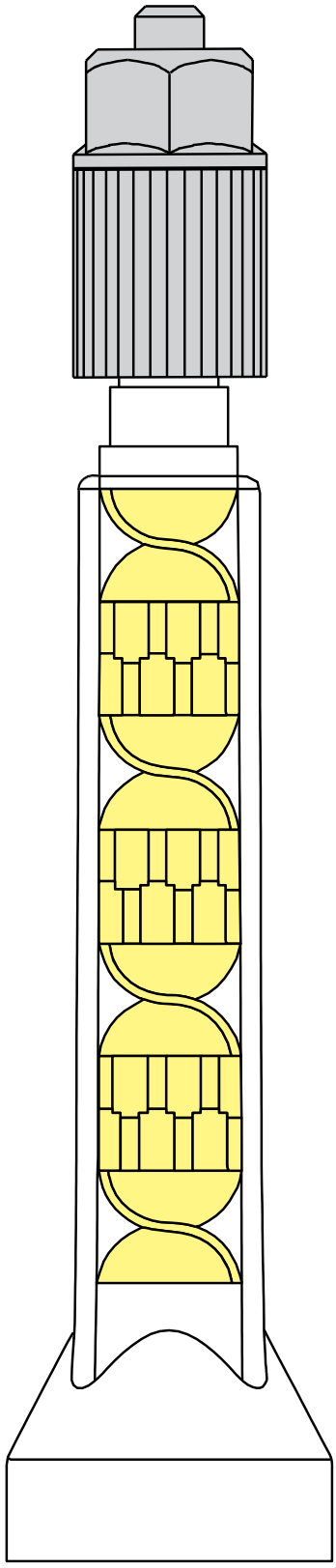
SKU: X2-B8-7L



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Xemex is a revolutionary new mixing technology for two-part adhesives. Unlike existing nozzles that rely on 2x-mixing per element, Xemex is the only mixer to achieve 10x-mixing per element. This allows Xemex to provide optimal mixing in only seven elements.

Xemex's shorter profile provides immediate savings in lost adhesive while bringing applications closer to your work surface. Contact Royal 4.0 to see how Xemex can help your manufacturing processes.

Features

- Patented Xemex mixing technology
- Bell connection for cartridge & meter-mix systems
- Luer-Lock tip for high precision dispensing
- Hydrophobic inserts for moisture-sensitive formulations
- Made in the USA, ensuring quality & stock availability

Benefits

- Improves mixing and adhesive performance
- Simplifies floor management. One mixer SKU to dispense:
  - Epoxies, Acrylics, Silicones, and Urethanes
  - A wide range of mix ratios (1:1, 2:1, 4:1, 10:1)
- Significantly reduces retained adhesive loss
- Eliminates bubbling and air-entrapment issues
- Improves ergonomics & dexterity for manual dispensing
- Increases meter-mixing accuracy & system clearances

Specifications

Insert Material:	Polyester - Yellow
Housing Material:	Polypropylene
Connection:	Bell - Straight
Nozzle Tip:	Luer-Lock
Insert Size:	7 Elements
Retained Volume:	2.7 mL
Total Length:	90 mm
Inner Diameter:	8.7 mm
Ratios Served:	1:1, 2:1, 4:1, 10:1
Systems Served:	Cartridge & Meter-Mixing

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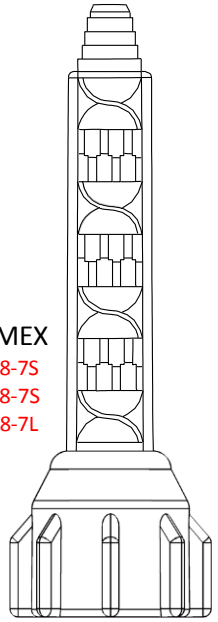
F-System Adapters

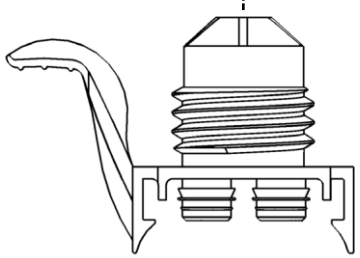


XEMEX
X1-B8-7S
X2-B8-7S
X2-B8-7L

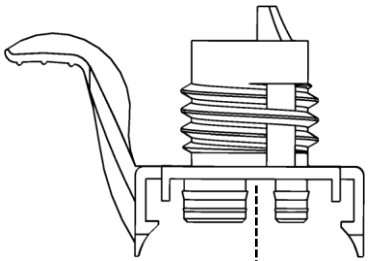
Bell Retaining Nuts

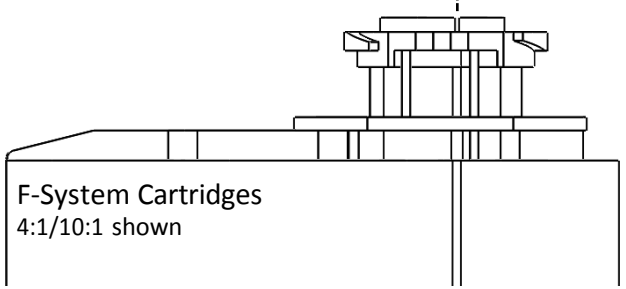
Contact Cliff with adapter needs

F-to-C Adapter
1:1, 2:1 Systems
EFD 7362591

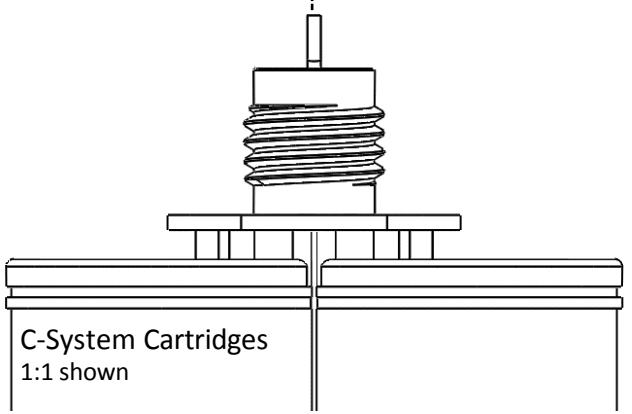


F-to-C Adapter
4:1, 10:1 Systems
EFD 7362590





F-System Cartridges
4:1/10:1 shown



C-System Cartridges
1:1 shown

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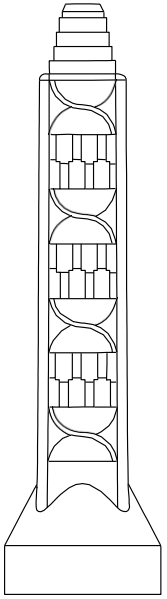
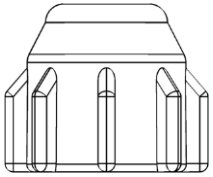
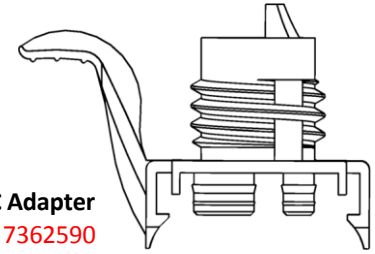
ConaShield™ CS-313
Polyurethane
4:1 Ratio/Vol.
Part A: ~600 cPs
Part B: ~50,000 cPs
Mixed: ~10,000 cPs
Gel Time: 4-6 min
Thixotropic



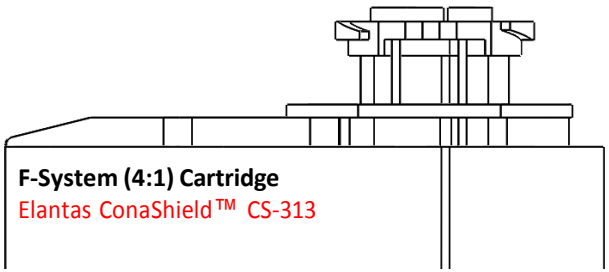
XEMEX
X1-B8-7S



Retaining Nut
EAUM-10-PP



F-to-C Adapter
EFD 7362590



F-System (4:1) Cartridge
Elantas ConaShield™ CS-313

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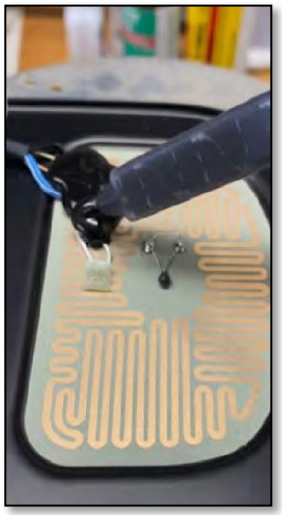
F-System Testimonial

I used the F-System 4:1 adapter [EFD 7362590] to dispense ConaShield CS-313 with the Xemex Mixer [X1-B8-7S]. Worked like a charm. If I had to use a traditional bell mixer, there's no way I could hold the 400ml gun and take this video at the same time.

- Dan Strawn

t=1s



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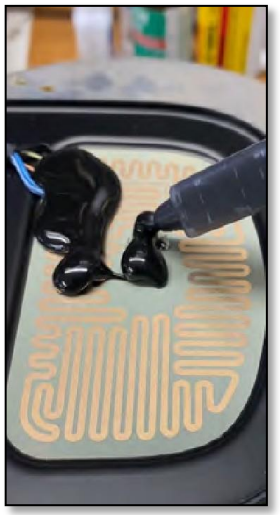

t=5s

Testimonials

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Distributor's Customer

The new Xemex mixer worked fantastic with Dow 3-4207. Greatly reduces wasted potting material and also mixed the 2 parts very well. This is exactly what we needed. If you have other customers with similar problems I would highly recommend Xemex.

Dee Gunderson

I sampled Xemex last week at my customer for their EA E60NC epoxy application and testing went quite well. They placed an order of 100 units. Tipping point: reduction of wasted material.

Randy Sharpe

I sampled Xemex at my customer and they liked them. They needed to test LORD Maxlok T-6 on their meter mix machine.

Alberto Vargas

I tested the UR6001-Black (400 ml cartridge, pneumatic dispenser) using Xemex mixers with excellent results. This customer will be sending me a PO.

Erin Stone

This customer understands how mixers work so they didn't think Xemex was going to mix ResinLab EP1295 or they thought it was going to require too much pressure to dispense. However, they didn't have to adjust their pressure, and the material flowed out fantastically. It was a drop-in fit. Perfect for saving $$ on material.

Jim Aiken

My customer had sporadic curing issues running EP965LVLX with a .187 X 48 helical mixer they were using. They dispensed some test patterns with Xemex and got a complete cure. They told me, "these mixing sticks work great".

Wayne Isaacks

They tested the new Xemex Mixer with an expensive thermally conductive paste. Xemex worked great! It was easy to see the cost savings from wasting less material in the mixer vs the Helical mixer they used previous. They were so impressed they order 50 on the spot!

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Case Studies

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January 2022

SKU: X1-B8-7S

Case Study

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(zeˈmeks)

Background

ESR	Matt Baahlmann
Application	Electronics Potting Manual Applicator Bell-Style Cartridge
Formulation	ResinLab EP965LVLX Epoxy (1:1) 2,800 cPs

Challenge

Supply-chain shortages forced switch to EP965LVLX. However, testing new material resulted in soft spots and tackiness when using previous mixers:

- EA250-32 (1/4" x 32 TAH Helical)
- EA187-32 (.187" x 32 TAH Helical)
- EA300-006 (7.5mm x 24 Quadro)

X1-B8-7S

Solution

Distributor sampled Xemex for in-house testing at customer's facility.

Results

After testing all four mixers, customer concluded that, "Xemex was the only suitable solution".

SKU: X1-B8-7S

Case Study

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(zeˈmeks)

Background

ESR	Dee Gunderson
Application	Tank Round Sealing Robotic & Manual Applicators Bell-Style Cartridge (200 mL)
Formulation	Huntsman ARALDITE 8503 Epoxy (1:1) 250,000 cPs

M865 Tank Round

Challenge

Manufacturer cited multiple mixing-related difficulties:

- Robotic applications lacked adequate space
- Manual applicators lacked dexterity
- Other mixers were seen as wasteful

X1-B8-7S

Solution

Distributor sampled Xemex and two other mixing options with Huntsman ARALDITE 8503 for internal testing.

Results

Customer tested all three mixers for performance and claimed that, "Xemex won the gold medal".

Xemex also solved robotic dispensing issues, where longer mixers did not leave adequate clearance for automation.

SKU: X1-B8-7S

Case Study

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Background

ESR	Bruce Shook
Application	Potting & Sealing (Water Meter Registers) Pneumatic Applicator Bell-Style Cartridge (400 mL)
Formulation	Henkel Loctite Urethane (2:1) Viscosity: 900 cPs Short Pot Life: < 10 min

Compound Register

Residential Meter

Challenge

Multiple issues were cited by manufacturer:

- Mixer lengths made dispensing difficult for operator
- Previous mixers were viewed as very wasteful

X1-B8-7S

Solution

Distributor sampled Xemex for in-house testing. Customer verified mixing performance with hardness and lap-shear testing.

Results

Customer purchased Xemex for their production of industrial and residential water meters, citing the following reasons:

- Greater versatility
- Improved ergonomics
- Reduced material waste

SKU: X1-B8-7S

Case Study

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(zeˈmeks)

Background

ESR	David Nemec
Application	Rubber Bonding (Conveyor Belt Systems) Manual Applicator Bell-Style Cartridge (400 mL)
Formulation	2K Polyurethane

Slider-Bed TL 30" Conveyor System

Challenge

Customer faced supply-chain issues with existing mixer, TAH 370-40.

*Re Mixers supply chain has remained unbroken throughout 2021

X1-B8-7S

Solution

Distributor sampled Xemex to customer for internal evaluation.

Results

In sampling, customer discovered Xemex advantages:

- Improved ergonomics
- Reduced material waste

Customer purchased a year's supply of Xemex nozzles.

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Value-Added

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January 2022

Overview

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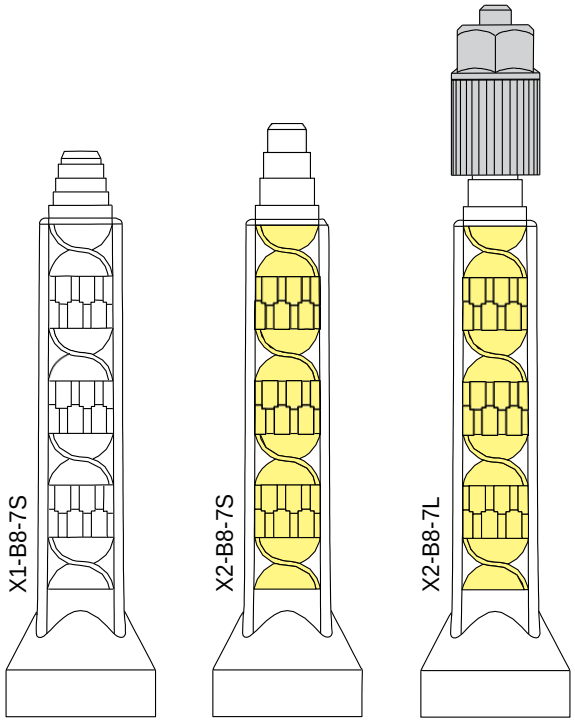
(zeˈmeks)

"Xemex is the biggest innovation we've seen since mixing tips were introduced"



- Optimizes Mixing
- Minimizes Waste
- Ergonomic Profile
- Highly Versatile
- Made in America

10^x Mixing

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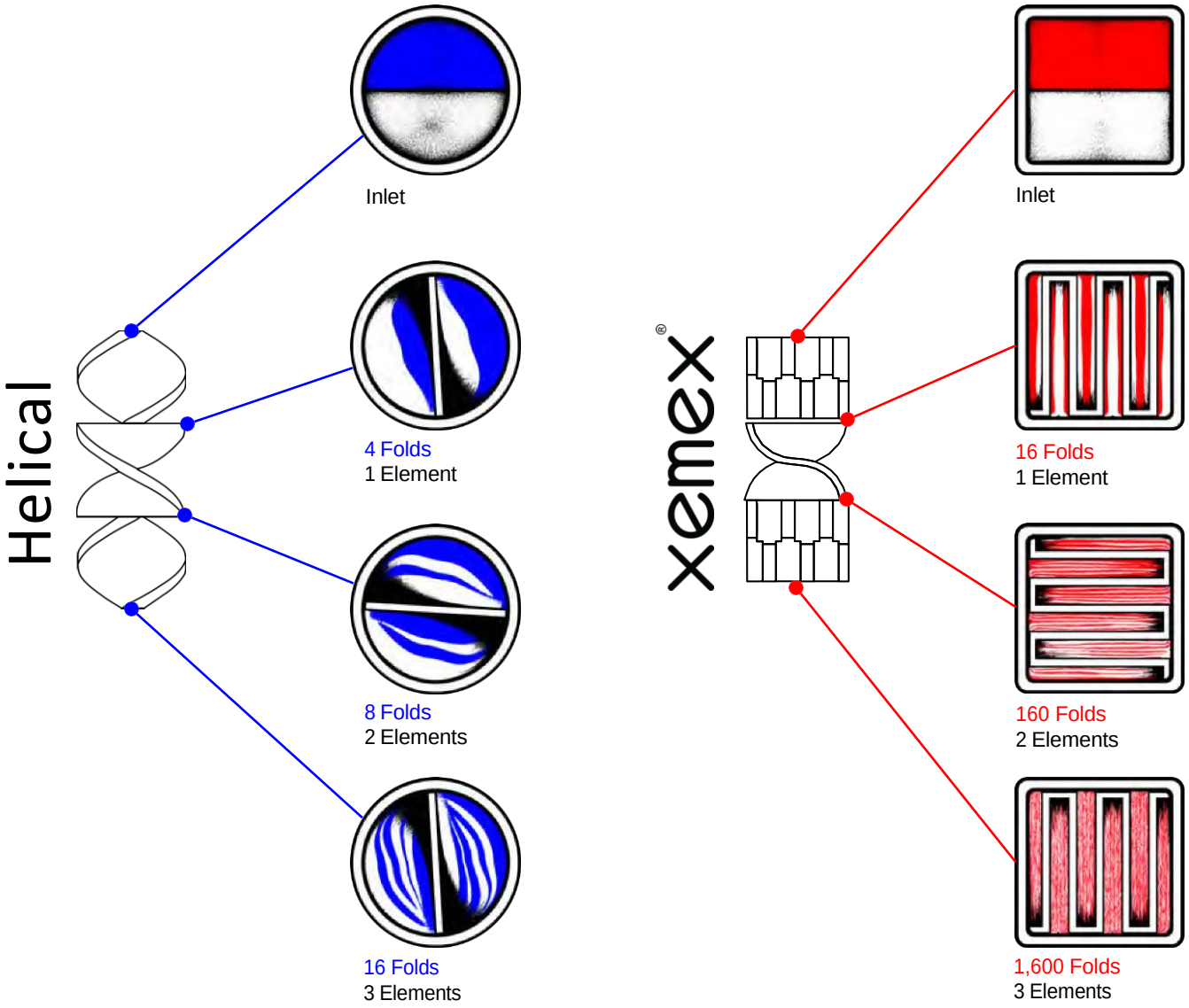
(zeˈmeks)



Traditional square and helical mixers rely on 2-fold mixing per element--also known as the Baker's Transformation. This is why traditional mixers often require 24 to 32 elements to reach adequate mixing.

Xemex is the only mixer to offer 10-fold mixing per element, giving Xemex-dispensed adhesives optimal mixing in only 7 elements.

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Efficiency

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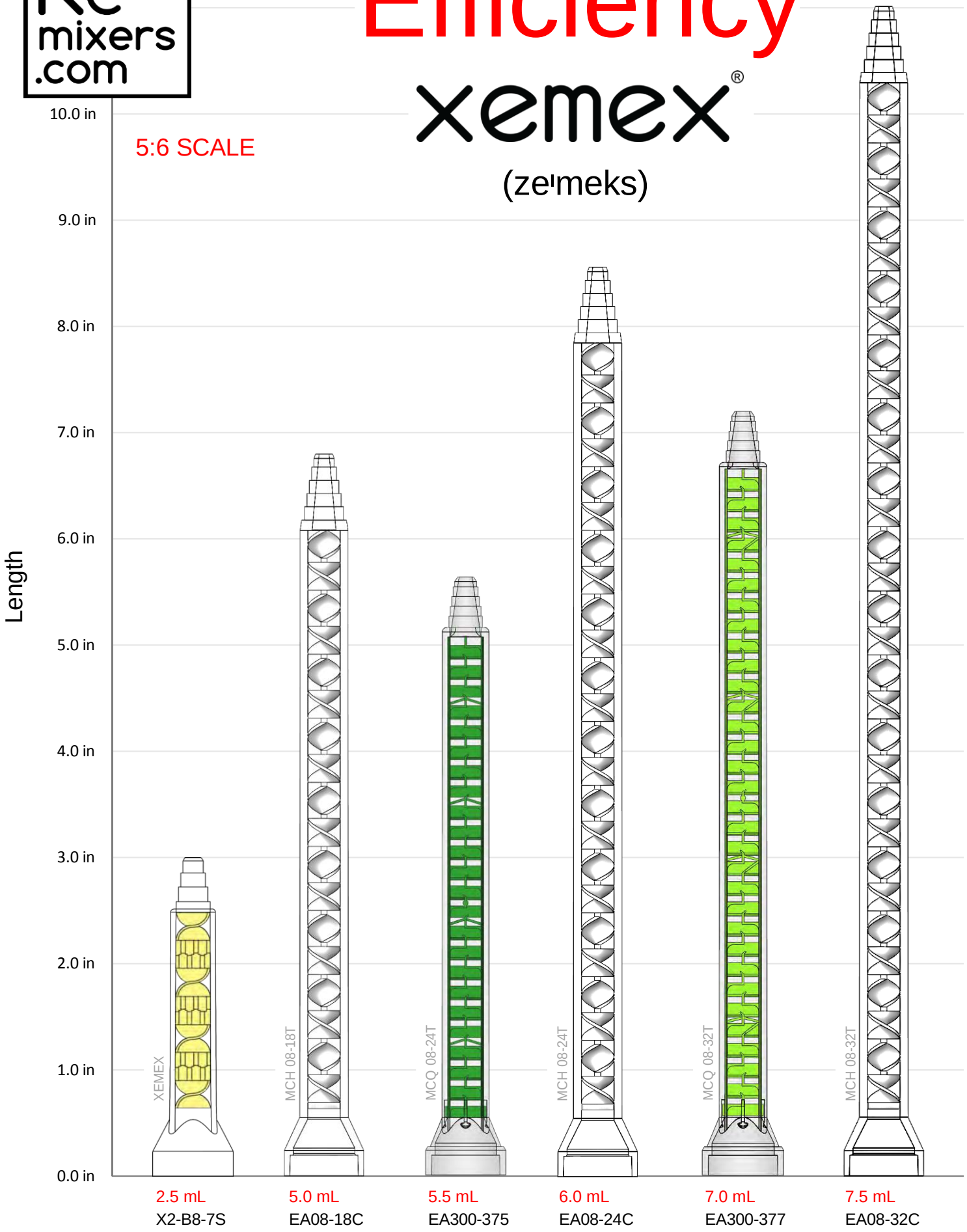
(zeˈmeks)

5:6 SCALE



2.5 mL	5.0 mL	5.5 mL	6.0 mL	7.0 mL	7.5 mL
X2-B8-7S	EA08-18C	EA300-375	EA08-24C	EA300-377	EA08-32C

Purging

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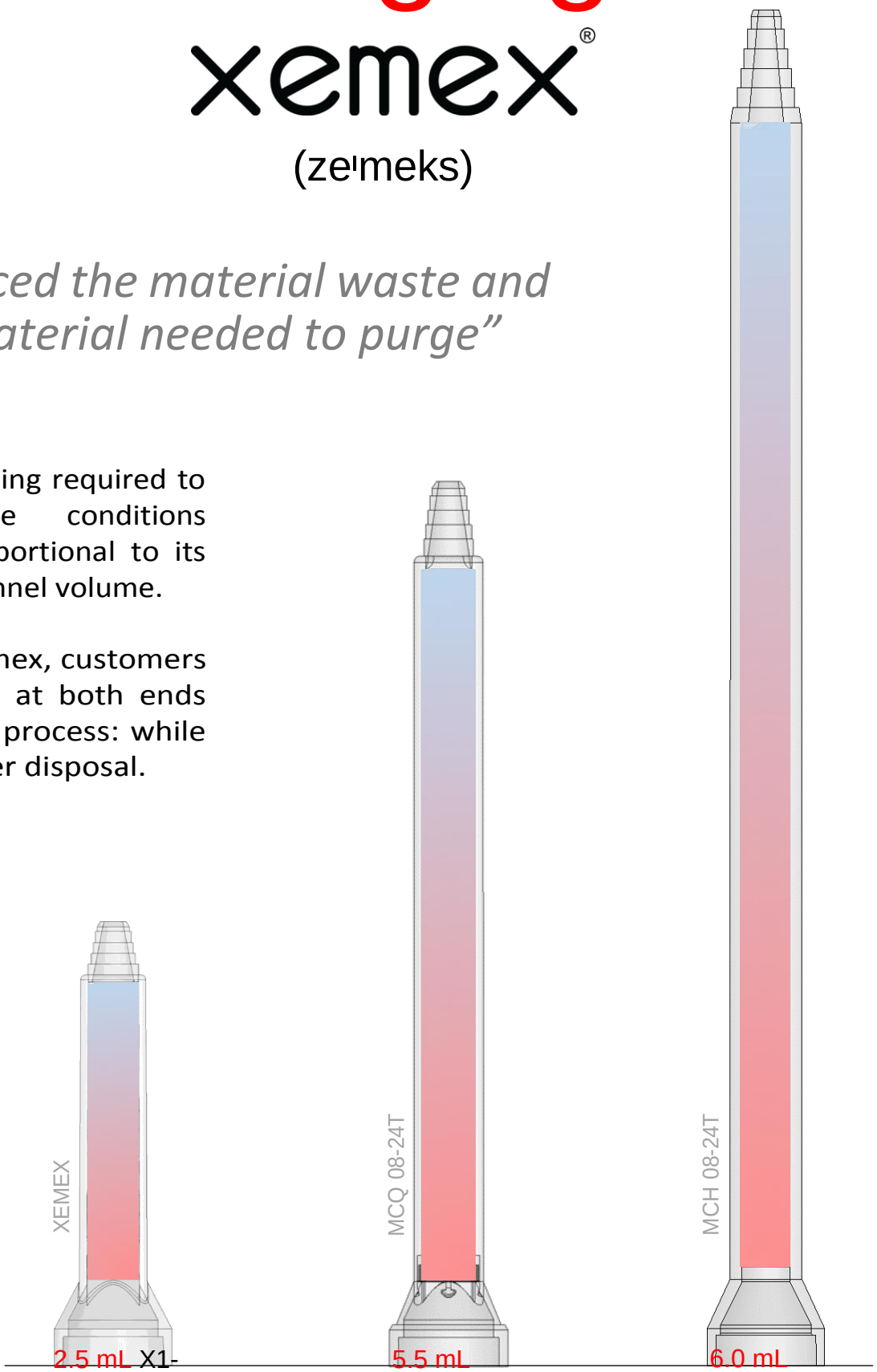
(zeˈmeks)

“Xemex reduced the material waste and amount of material needed to purge”

The amount of purging required to reach steady-state conditions with Xemex is proportional to its incredibly small channel volume.

By switching to Xemex, customers can expect savings at both ends of their dispensing process: while purging and at mixer disposal.



Ergonomics

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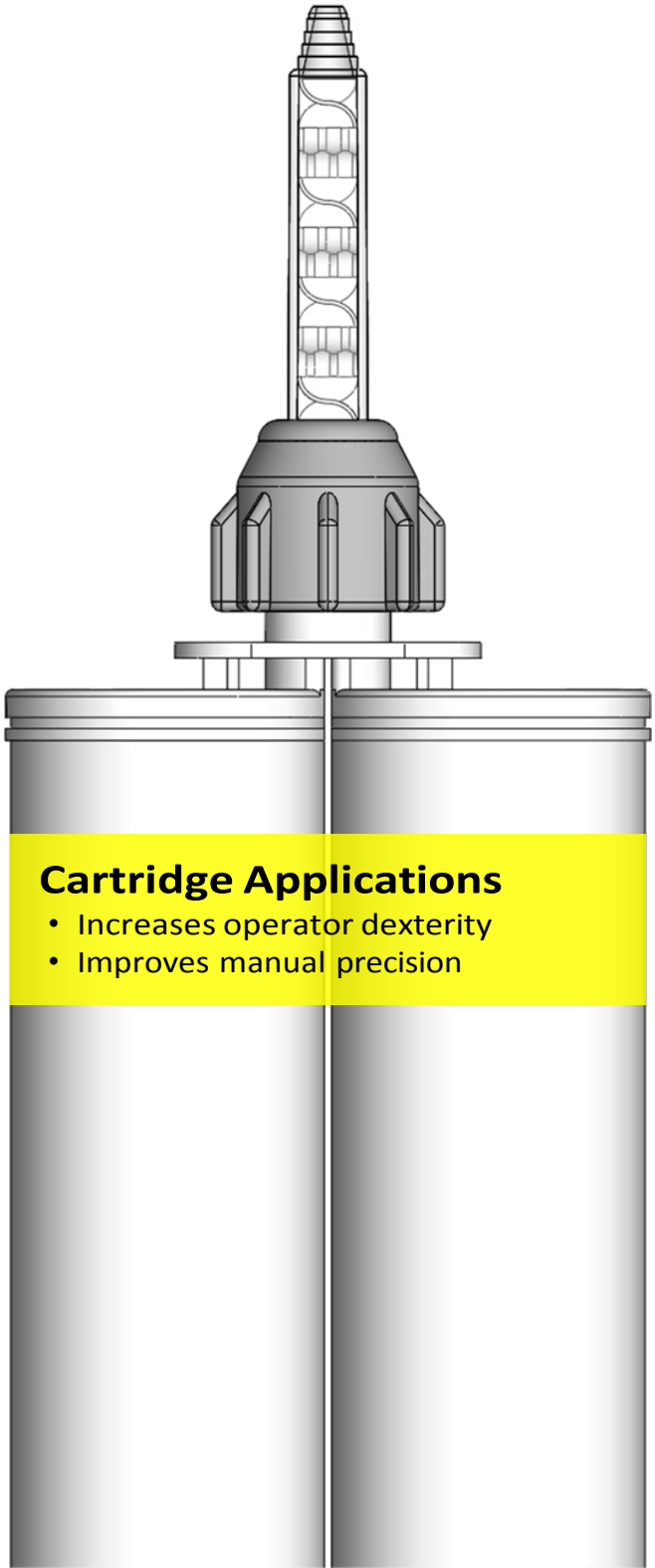
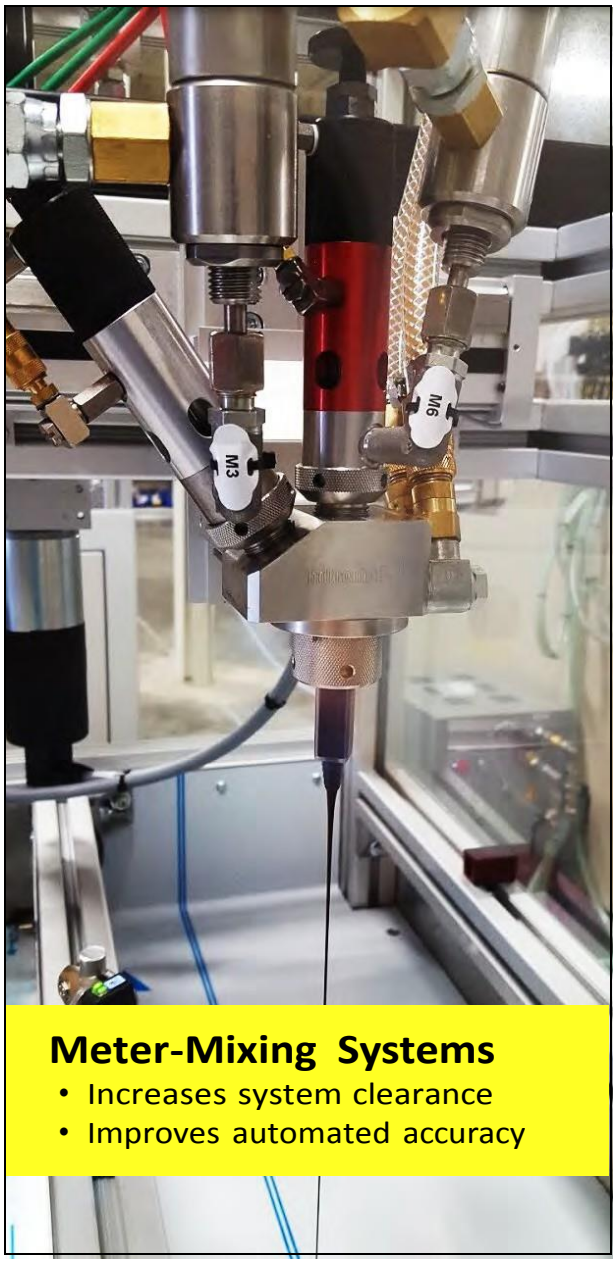


Cartridge Applications
- Increases operator dexterity
- Improves manual precision



Meter-Mixing Systems
- Increases system clearance
- Improves automated accuracy

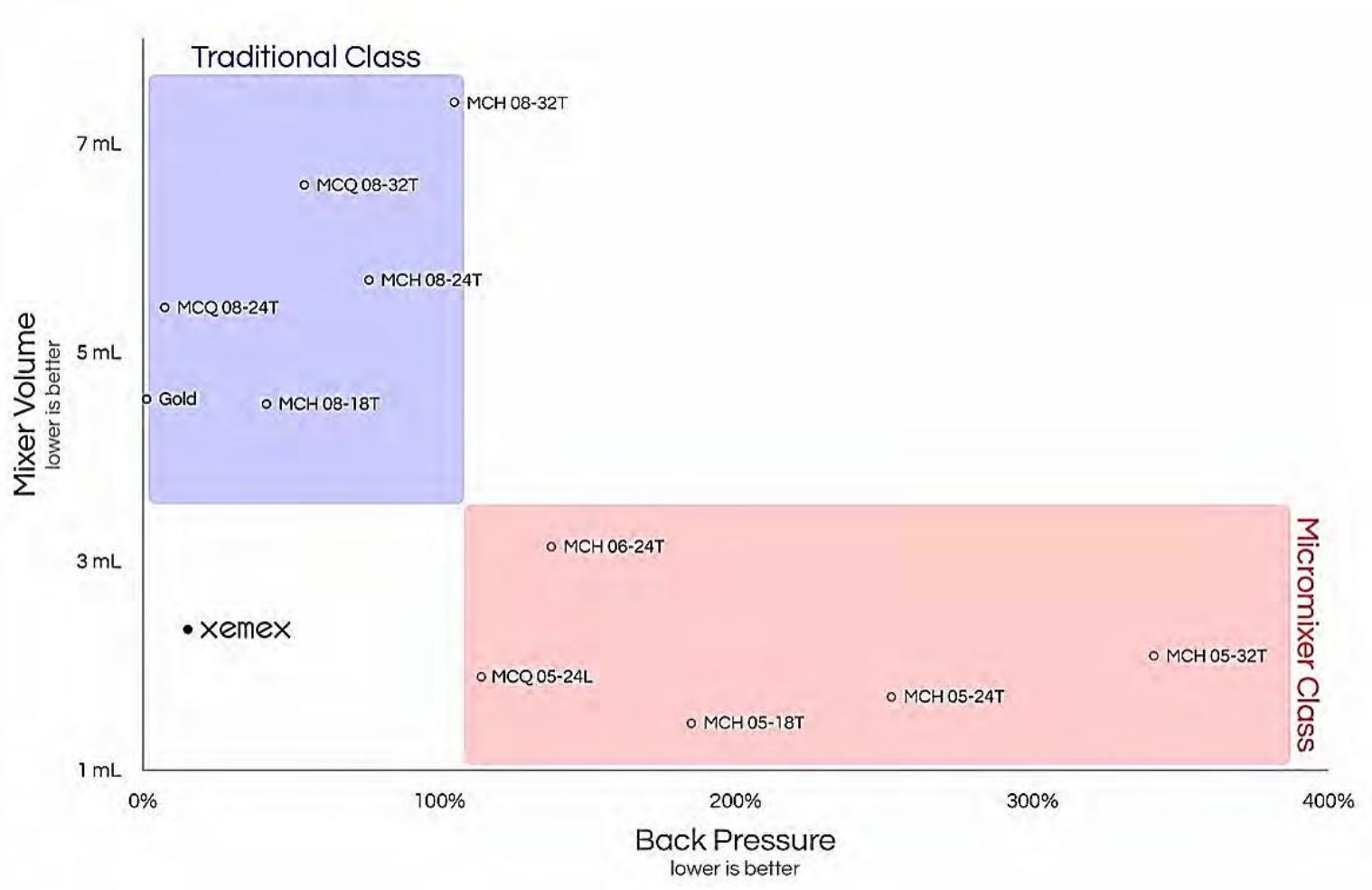
Dual Component Dispenser
Automated for Xemex on a Multi-Port Static Mixing Head with needle valves

Throughput

xemex®

(zeˈmeks)

Xemex captures the best of two mixing classes. With back pressure akin to traditional 8mm mixers—while having an internal volume of only 2.5 mL—Xemex is redefining the balance between efficiency and throughput.

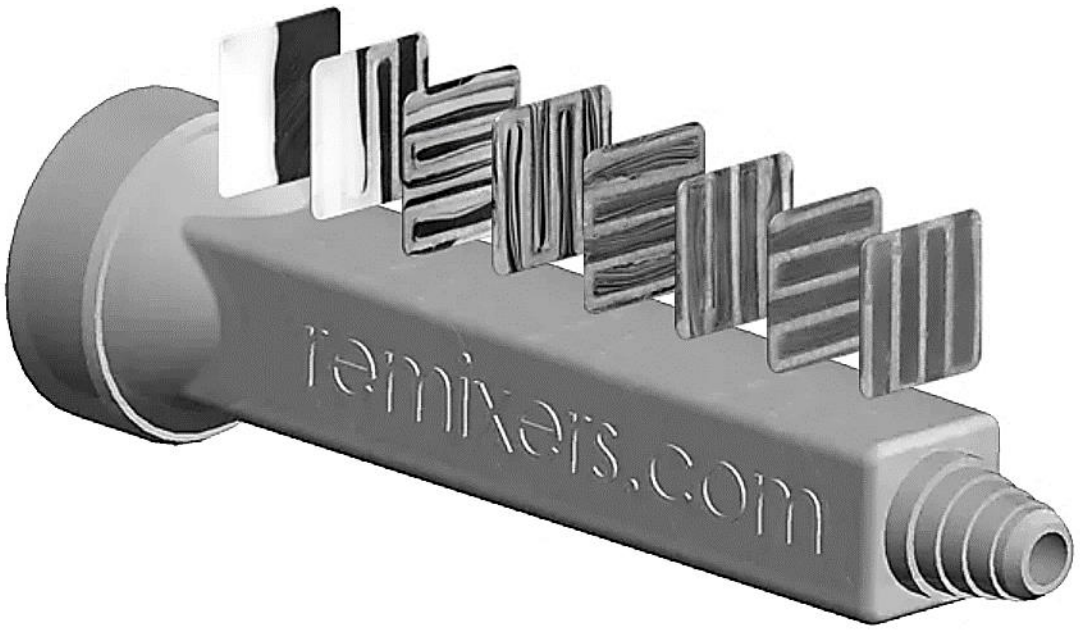


Versatility

xemex®

(zeˈmeks)

"The Xemex static mixer provided a good mix for adhesives of all viscosity levels"



Simplify your production line with a single SKU

Through extensive testing, Xemex was optimized across the common array of industry formulations, viscosities and mix ratios. Learn about Xemex's versatility through our White Papers and Technical Datasheet.

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External Review

xemex®

January 2022

ITW Performance Polymers

Technical Services Dept., 30 Endicott Street, Danvers, MA 01923 / Tel: +1-978-777-1100 / +1-855-489-7226

TECHNICAL BULLETIN

TESTING OF XEMEX MIX NOZZLES

This study was initiated to determine if the Remixer's Xemex nozzle is suitable to be used with 1:1 ratio Plexus adhesives. In order to determine the efficacy of this nozzle, a series of cure and reactivity testing was conducted. These results were compared with the standard "3333" 1:1 mix ratio nozzle results.

As a result of this screening it was determined that the Remixer Xemex nozzle can be recommended as a suitable replacement for the 3333 nozzles in general cases on at room temperature of approx. 72F at this time. For specific applications testing will be required for confirmation.

It should be noted that these lab results are only trends and as with all structural bonding, it is recommended the customer prepare a testing protocol to determine the suitability of Plexus adhesives for their application and process.

TEST PROCEDURE(S):

Testing was conducted at ITW Performance Polymers' Technical Service laboratory in Danvers, Massachusetts at an ambient temperature of approx. 72F. Exothermic reactivity testing was performed using a digital data logging thermocouple. Samples consisted of 10 g mass of mixed adhesive. The thermocouple was inserted into the adhesive immediately after mixing to track the progression of its polymerization reaction. Temperature data was collected with respect to the duration of the experiment. The peak temperature and the time of that temperature were reported and used for comparison. Plexus MA300 and MA8120 were tested with both the Xemex nozzles and the standard 3333 nozzles.

RESULTS:

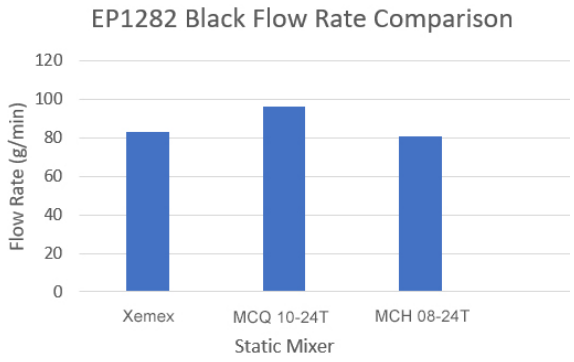
	Adhesive	Exo Time (min)	Exo Temp (°F)
Xemex	MA300	11.02	316.36
	MA8120	60.63	242.52
Control "3333"	MA300	~ 9	~ 320
	MA8120	57.5	256.36

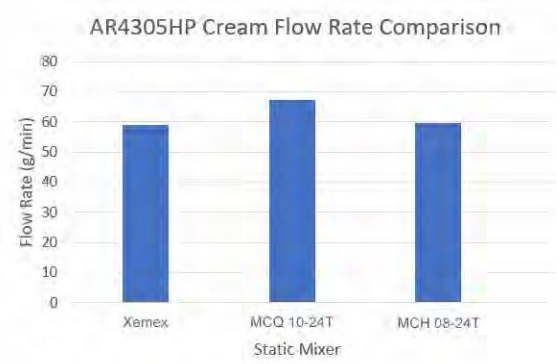
* Tested with 30g Sample

Xemex Static Mixer Comparison to Sulzer and Mixpac Competitors

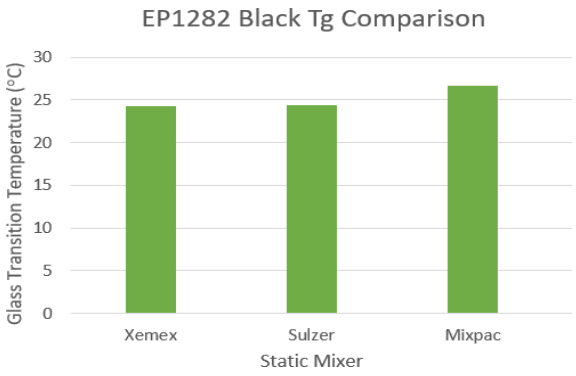
Upon request, ResinLab has evaluated Xemex static mixers against existing Sulzer and Mixpac static mixers. Our findings are as follows:

When used with low and high viscosity materials, Xemex static mixers provided an easy dispense with a good overall mix. When tested side-by-side, Xemex provided a good mix of low and high viscosity materials, comparable to its competitors. Flow rate data shows Xemex and Mixpac are in-line with each other, while Sulzer outperformed both.

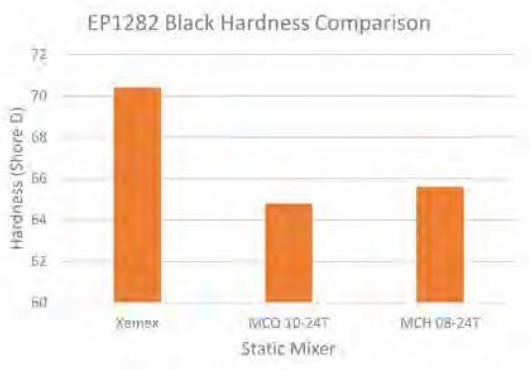


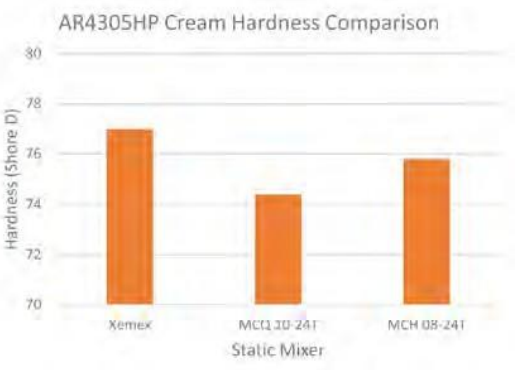


Cured materials had similar hardness and glass transition temperature (Tg) values.



Overall, the Xemex static mixer provides a good mix for adhesives of all viscosity levels while maintaining the same physical properties exhibited by the competition.





DOWSIL 3-4207 (4/16/21)

Xemex on FRC Equipment

"All xemex mixers cured fine with the proper durometer. Below are some mixed tins of 3-4207"



Other Experiments (4/5/21)

Xemex on FRC Equipment

"Frankly, we are trying materials with known difficult properties, wide ratio & wide viscosity disparity"


Material	Type	Mixed Viscosity	Ratio PBV	Flow rate	Result
RTV-4130	Silicone	230,000 cps	10:1	0.50 cc/sec	soft spots & streaks
ENZ-90ZR	Urethane	13,000 cps	5:1	0.08 cc/sec	soft spots & streaks
EP1390	Epoxy	7,100 cps	4:1	0.50 cc/sec	streaks
GSP-1603-86	Urethane	6,000 cps	4:1	4.0 cc/sec	overpressure, 500PSI
EN-1556	Urethane	4,000 cps	3:1	0.75 cc/sec	soft spots & streaks
2850FT	Epoxy	200,000 cps	12:1	0.25 cc/sec	streaks

METER-MIXING TRIAL

Xemex Static Mixer

This trial used a Dual-Component Meter-Mixing System to test the the Xemex Static Mixer for mix quality and required dispense pressures when used with a high-ratio epoxy.

LORD CoolTherm™ EP-636 Epoxy Encapsulant is a filled epoxy with a 100:1 mix ratio having a mixed density of 1.58 grams/cc. This trial dispensed EP-636 at a flow rate of 2.02 grams/second, or about 1.28 cc/s. The mixed viscosity of this material is 50,000 cPs.

- Component A: 86,000 cPs, heavily filled with Crystalline silica
- Component B: 3,500 cPs

Results are summarized below.

Mix Tube	8.7x32 Square	Xemex
Pressure A in bar	4.0	4.3
Pressure B in bar	1.5	1.7
Temp °C	57	57
Temp °F	134.6	134.6
Shore D - Cured	95	95

Table 1. The required flow rate of 2.02 grams/second was achieved at acceptable back pressures. Material hardness indicates adequate curing.

Figure 1. An image of cross-sectional profile shows the cured material's grain structure. No bubbles, or uncured voids were observed. Xemex shows adequate mixing for the tested material.

Xemex Nozzle Review

Manufacturing Engineering- Assembly

Hatco Corporation

Item	Style	Qty/Yr	Cost/Unit	Waste (g)
SS.05.055.00	Sulzer B	6709	2.04	1.97
SS.06.174.00	Sulzer-F	3190	2.05	9.45
SS.06.188.00	MS Bell	640	2.38	4.67
CHL_002	Sulzer-B	1720	1.47	3.78

Table 1: Nozzle Types and Yearly Usage

Criteria	SS.06.188.00	Xemex
Unit Cost	$2.38	$1.96
Material Waste	4.67g	3.5g
Cost $.11/g	$.51	$.385

Table 2: Unit-Cost Comparison

Purpose

Currently Hatco uses a variety of mixing nozzles for different epoxies and glue around the plant. These nozzles are disposable and after use, are discarded with a portion of the glue used, unable to be retrieved. These glues are often expensive, so mitigating this waste is an easy way to save Hatco money. At Assembly Show 2019, the Re Mixers, Inc. launched the new Xemex Mixing Nozzle. Re Mixers is based in Madison, WI and has just released a new line of mixing nozzles that would work as a direct replacement to some of our current nozzles. These nozzles mix the epoxies better, allow a higher flow rate of material, and waste less material in disposal. This report outlines the challenges, benefits, and processes of switching our current nozzles over to Xemex nozzles.

Numbers

We currently employ 4 nozzle types throughout the factory, these nozzles are specific to their respective cartridge style. Between these four nozzles there are three different connection styles. Table 1 shows the yearly usage of each nozzle and unit cost.

Xemex Overview

After discussions with the Re Mixers President, Eric Ronning, Hatco received samples of their Xemex nozzle. This nozzle was tested in the CHL department with Loctite AA H301. This adhesive is used to bind stone top plates to aluminum bases. After use, the nozzle was compared to the original version. The results can be seen in Table 2. The new nozzle boasts a 30% reduction in wasted material. A total of $.55 per nozzle is saved by replacing the current standard with Xemex with no consequences. Re Mixers have, in development, Bayonet style connectors (currently not used by Hatco) for release next year. Pricing of the Xemex is based on a batch purchase of 500 nozzles.

Plan for Implementation

Upon finding the promising results of the Xemex Nozzle, ME-A would like to pursue Re Mixers as a supplier for a direct replacement of the SS.06.188.00 Nozzle. An EC request will be filled out to begin this change and a PO for the first supply of nozzles will also be submitted. Discussions with both Re Mixers and Loctite will be had to determine whether or not the technology can be utilized in other places around our factory..

Xemex Roll Out

As of mid-February 2020, the Xemex nozzle has been implemented as a direct replacement to SS.06.188.00. On top of already known savings on part cost and waste reduction, time savings became obvious. Initial times studies showed a 50% reduction in cycle time for laying adhesive on stone top shelves. A complete times study is being performed to fully quantify the time savings and the final report will show total cost savings

Size	Xemex	SS.06.188.00	% Reduction
15.5"x24"	1:06		
15.5"x36"	1:09	1:36	28%
15.5"x48"	0:54	1:52	52%
18"x24"	0:50	0:58	13%
18"x36"	1:04	1:34	32%
18"x48"			
24"x24"			
24"x36"			
24"x48"	2:10	3:06	30%

Table 3: Time Trial Between Nozzles

Fig. 1: X1-B8-7S (Xemex)

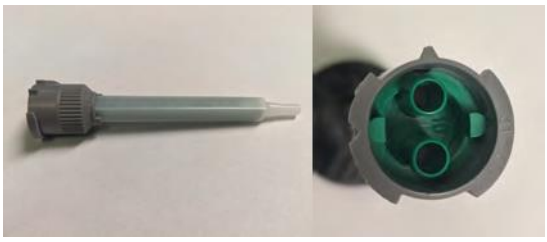


Fig. 2: SS.05.055.00

Fig. 3: SS.06.174.00

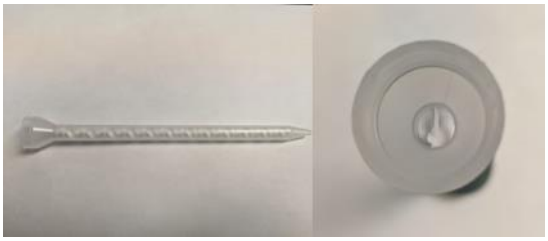


Fig. 4: SS.06.188.00

Fig. 5: CHL_002

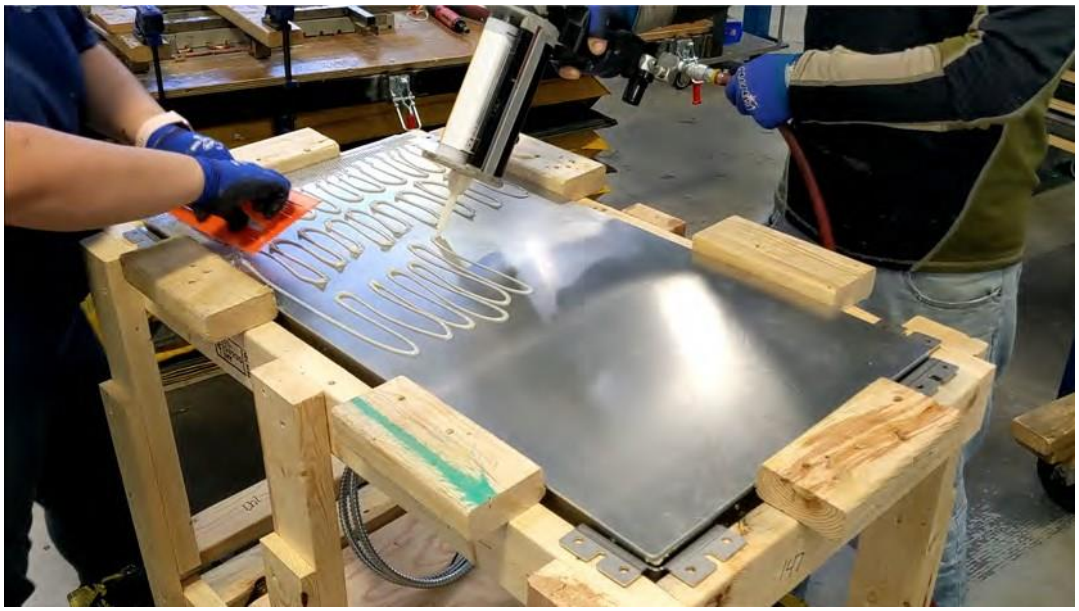


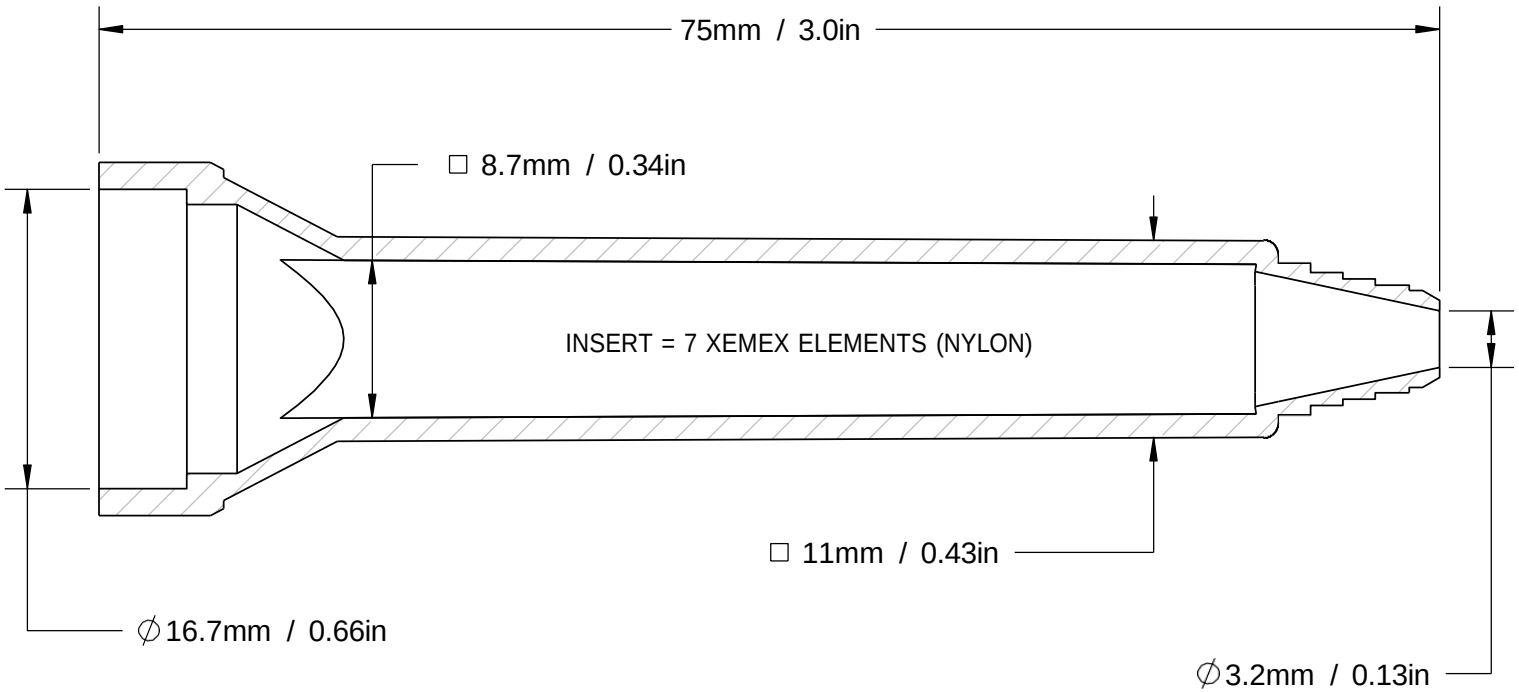
Image 1: Aluminum Bonding to Stone

Remixers.com™

Dimensions

xemex®

January 2022

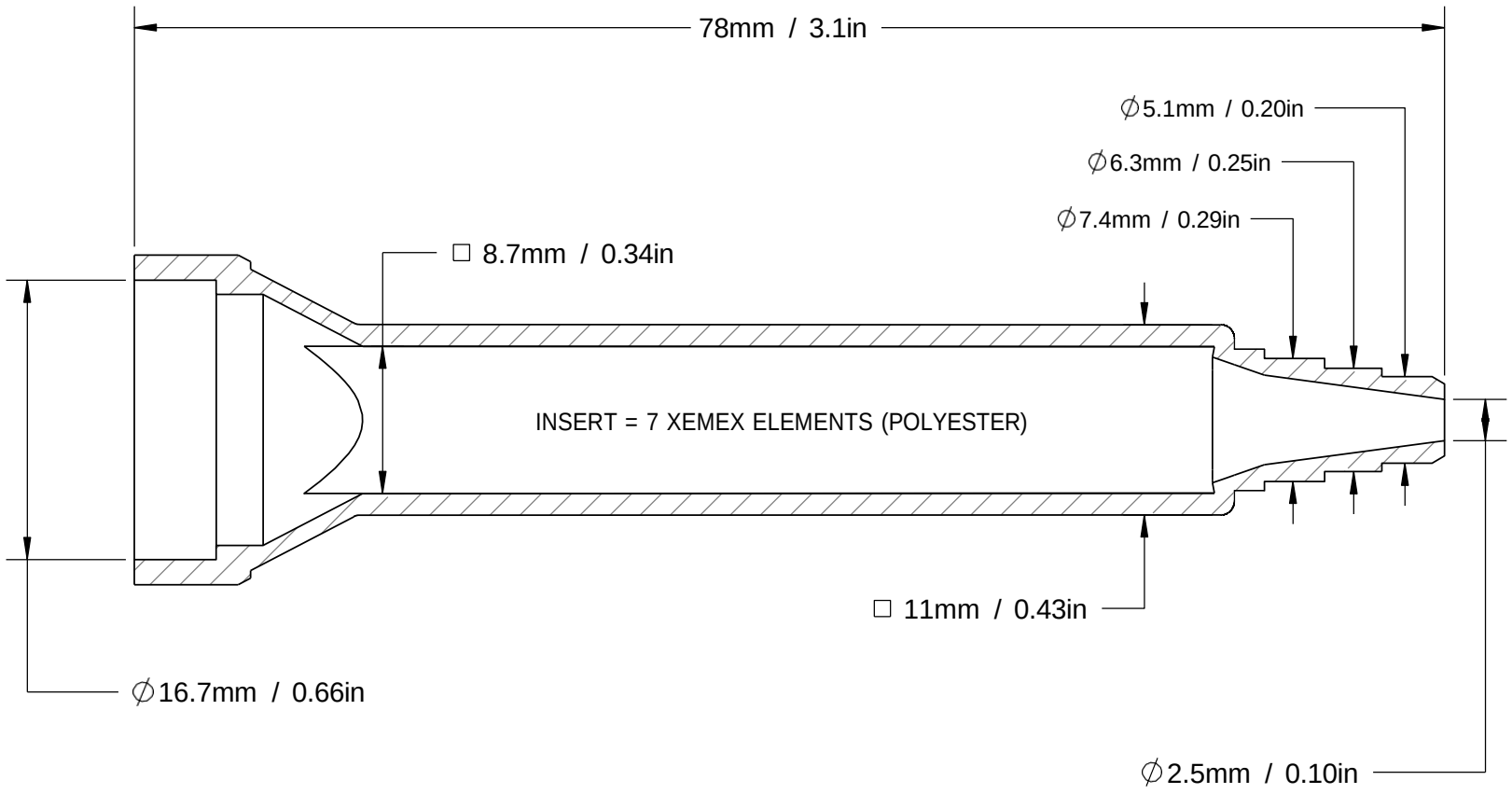


UNITS	PRODUCT	SKU	Re Mixers, Inc.
MM / IN	XEMEX	X1-B8-7S	

MATERIAL
Insert: PA (White)
Housing: PP (Clear)

SIZE	DRAWN BY	REV
A	E. Ronning	7.9

SCALE: 5:2 | SHEET 1 OF 1

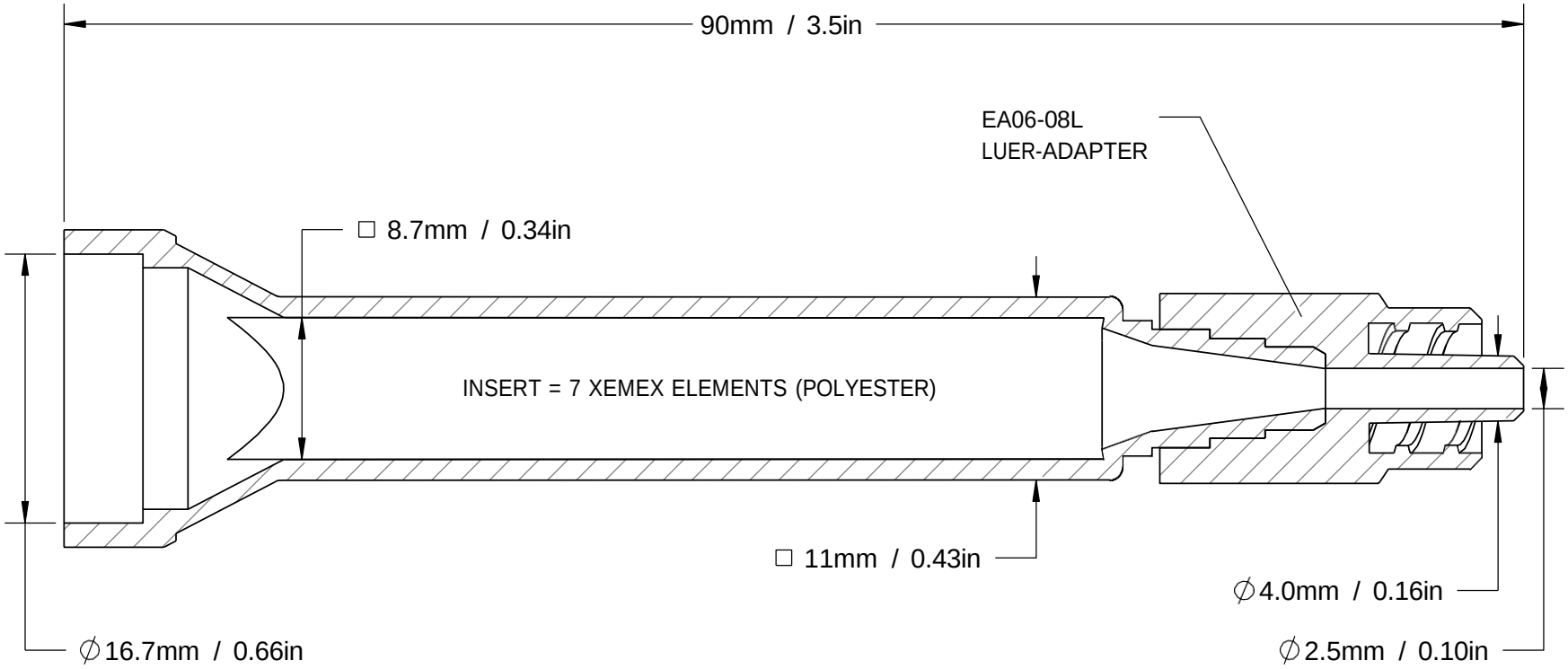


UNITS	PRODUCT	SKU	Re Mixers, Inc.
MM / IN	XEMEX	X2-B8-7S	

MATERIAL
Insert: PE (Yellow)
Housing: PP (Clear)

SIZE	DRAWN BY	REV
A	E. Ronning	1.4

SCALE: 5:2 | SHEET 1 OF 1



UNITS	PRODUCT	SKU	Re Mixers, Inc.
MM / IN	XEMEX	X2-B8-7L	

MATERIAL
Insert: PE (Yellow)
Housing: PP (Clear)

SIZE	DRAWN BY	REV
A	E. Ronning	1.0

SCALE: 5:2 | SHEET 1 OF 1