

# Mi Mixers

## Introduction

### Mixers

**Laboratory Mixers** are available with permanent magnet, universal, or air-drive motors. Choose different mixer mounts for mounting on tanks or stands. Our variety of impellers and paddles lend versatility to the mixer you select..... **973-987**

**Industrial Mixers** are available with electric- or air-driven motors for up to 1-hp. Fixed- or variable-speed and direct- or gear-driven options are available..... **988-994**

#### Specialty Mixers include:

**Dispersion and Double-Helix Mixers** are ideal for mixing fine powders, mixtures with solids, and high-viscosity fluid ..... **995**

**Sanitary Mixers** for all applications requiring extra clean processes ..... **988**

**Handheld Mixers** for mixing thin or heavy liquids in open or closed containers..... **995**

**Bulk-Container Mixers** mount atop tote containers and mix liquids that are in long- or short-term storage ..... **996**

**Static Mixers** are installed inline and mix fluids as you pump them through a pipeline. The fluid moves through the mixer in an alternating clockwise/counterclockwise motion to ensure a homogeneous product. They are virtually maintenance free and need no spare parts..... **1000-1001**

**Powder Mixers** for mixing dry materials and small solids ..... **1002**

**Accessories** are available for all our mixers. Our Application Specialists can assist you in choosing the right impellers for optimum mixing ..... **996-999**

### A Guide to Mixer Selection

Cole-Parmer offers a broad selection of mixers and mixer products to suit almost any application. Proper selection of a mixer requires knowledge of certain application variables:

**1) Container capacity:** tank diameter and batch height.

**2) Liquid viscosity:** Different types of liquids display unique characteristics when force is applied. Four most common types of liquid behavior are listed below—all of our mixers are to be used with fluids exhibiting Newtonian, pseudoplastic, or thixotropic behaviors. Refer to the “Viscosity Values Conversion Table” on page 973 for typical viscosities of common liquids.

**Dilatant Liquids**—viscosity increases as shear rate increases. Mixers can bog down and stall after initially mixing such liquids. Dilatant liquids include slurries, clay, and candy compounds.

**Newtonian Liquids**—viscosity remains constant regardless of shear rate or agitation. As mixer speed increases, flow increases proportionately. Newtonian liquids include water, mineral oils, and hydrocarbons.

**Pseudoplastic Liquids**—viscosity decreases as shear rate increases, but initial viscosity may be sufficiently great to prevent mixing. Typical pseudoplastic liquids are gels, latex paints, and lotions.

**Thixotropic Liquids**—as with pseudoplastic liquids, viscosity decreases as shear rate or agitation increases. When agitation is stopped or reduced, hysteresis occurs and viscosity increases. Often the viscosity will not return to its initial value. Thixotropic liquids include soaps, tars, shortening, glue, inks, and peanut butter.

**3) Torque requirements:** the rotational force required of the mixer motor—measured in in-oz or in-lb.

**4) Horsepower (hp) requirements:** the efficiency required of the mixer motor with regard to torque (in-oz) and to the rotation speed (in revolutions per minute—rpm) as defined by the following equation:

$$\text{hp} = (\text{in-oz} \times \text{rpm}) / 1,008,400$$

**5) Rotational speed (rpm) and diameter of mixing propeller:** A small increase in the rpm or diameter greatly increases the power required for mixing. This relationship can be expressed as follows:

$$\text{Power} \propto \text{rpm}^3 \times \text{dia}^5$$

**6) Duty cycle:** the time interval devoted to starting, running, stopping, and idling when a device is used intermittently.

**7) Power supply:** electric (115 or 230 VAC) or air-drive mixers for areas where electricity is unsafe or impractical.

**GO to ColeParmer.com**

[ColeParmer.com/Mixers](http://ColeParmer.com/Mixers)

For our latest selection and information.

### Technical info

Figure 1

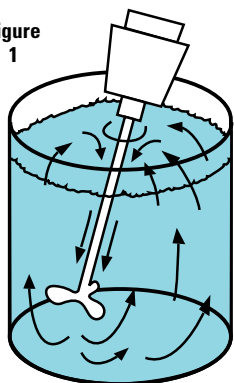


Figure 2

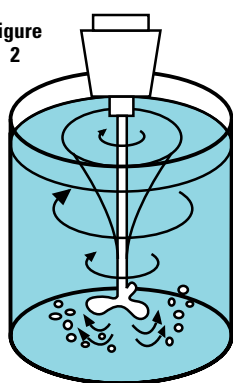


Figure 3

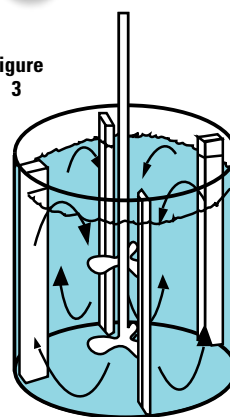
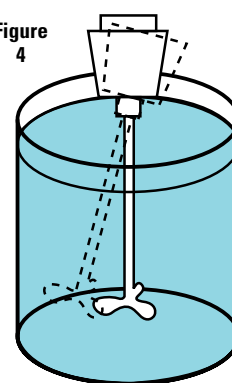


Figure 4



#### Positioning a mixer in a cylindrical vessel...

**Figure 1:** Aiming the shaft off center avoids vortexing and allows strong top-to-bottom turnover. This is the best position for most mixing and blending.

**Figure 2:** A center stirrer with a straight-blade propeller creates vortexing in an unbaffled vessel. Vortexing speeds up dispersion and dissolution of light liquids/hard-to-wet powders.

**Figure 3:** Baffles prevent vortexing and excessive aeration created by center-mounted stirrers with straight blade propellers. Four vertical baffles should be equidistant around the circumference of the vessel. Baffle width should be  $\frac{1}{2}$  the diameter of the tank.

**Figure 4:** You may want more than one stirring action for multiple-step mixing. For example, if you first need to dissolve light powders, you can center the stirrer to create a vortex. Then you can reposition the stirrer at an angle to maintain a uniform suspension or to blend in other fluids. Portable clamp-mount stirrers make repositioning easy.

**More info**

Use the below chart to estimate the mixer horsepower you will need for your application.

**Selecting Mixer Horsepower and Type**

Volume	$\frac{1}{10}$ hp gear drive mixers	$\frac{1}{15}$ hp direct drive mixers	$\frac{1}{30}$ hp direct drive mixers
	Viscosity (cps)		
50 gal.	1	1	—
25 gal.	100	25	1
15 gal.	250	100	10
5 gal.	500	250	25
1 gal.	1000	500	250
$\frac{1}{2}$ gal.	2000	500	500
1500 mL	2500	1000	500
750 mL	5000	1500	1000
500 mL	5000	2000	1000

**Viscosity Value Conversion Table**

Centipoise* (cp)	Centistokes (cSt)	Saybolt Second Universal (SSU)	Typical liquid
1	1	31	Water
3.2	4	40	Milk
12.6	15.7	80	No. 4 fuel oil
16.5	20.6	100	Cream
34.6	43.2	200	Vegetable oil
88	110	500	SAE 10 oil
176	220	1000	Tomato juice
352	440	2000	SAE 30 oil
880	1100	5000	Glycerine
1561	1735	8000	SAE 50 oil
1760	2200	10,000	Honey
3000	4500	20,000	Glue
5000	6250	28,000	Mayonnaise
8640	10,800	50,000	Molasses B
15,200	19,000	86,000	Sour cream
17,640	19,600	90,000	SAE 70 oil

\*Centipoise = centistokes x specific gravity where specific gravity is assumed to be 0.8 (except for water). To find the exact cp of your fluid:  $cp = cSt \times (\text{weight per gallon} \times 0.120)$ .

**One-Liter Blenders**

Two-speed blenders feature push-button speed control for 18,000 and 22,000 rpm operation. All models include a container, lid, and stainless steel (SS) blades. The 120 VAC models have a 6-ft cord with U.S. standard plug; 240 VAC models have a 6-ft cord only.



04241-10

**Specifications & Ordering Information**

Catalog number	Container material	Power	Price
<b>Two-speed blenders with standard motor</b>			
<a href="#">EK-04242-10</a> <a href="#">EK-04241-10</a>	Glass SS	120 VAC, 50/60 Hz, 3.6 A	
<a href="#">EK-04242-11</a> <a href="#">EK-04241-11</a>	Glass SS	240 VAC, 50/60 Hz, 1.9 A	
<b>Two-speed blenders with heavy-duty motor</b>			
<a href="#">EK-04241-20</a> <a href="#">EK-04241-22</a>	Glass SS	120 VAC, 50/60 Hz, 7.0 A	

**Cole-Parmer® Mini-Mag Stirrer****Stir one liter of liquid up to 2000 rpm**

Economical mini-stirrer is powerful enough to stir one liter of liquids up to 2000 rpm. Base is manufactured of Hytrel® and the top is chemically resistant nylon.

**What's included:** 5½-ft cord, U.S. plug, and 5/8" x 1/8" stir bar.



04807-10

**Specifications & Ordering Information**

**Dimensions:** 5½"W x 2½"H x 5½"D

**Power:** 115 VAC, 60 Hz

Catalog number	Top plate Dimensions	Materials	Speed range	Price
<a href="#">EK-04807-10</a>	4½"W x ¾"H x 4¼"D	Nylon	350 to 2000 rpm	

**Compact Mixer****Unique, space-saving design!**

Compact mixer measures only 3⅝"W x 3½"H x 6⅞"D, yet it handles as much solution as most conventional mixers—up to 1.8 liters at a maximum speed of 2000-rpm. Minimum speed is 20 rpm. Maximum viscosity is 100 cp. Mixer is blue in color to brighten your lab, and comes with a heavy-duty stand. Shaft is 6½" in length. Order optional screw-type stirring element 50702-55 to mix contents of narrow vessels such as test tubes.

**What's included:** 1⅜"-dia, two-blade stirring element, stand, and 6-ft cord with two-prong plug.

**Specs & Ordering Information**

Catalog number	hp	Power (VAC, Hz)	Price
<a href="#">KH-50702-04</a>	$\frac{1}{100}$	100/240, 50/60	

[KH-50702-55](#) Screw-type stirring element; ½" dia

50702-04



# Mi Mixers

Laboratory

## Cole-Parmer Stir-Pak® Mixers

High-quality, variable-speed mixers featuring full-range performance

### Stir-Pak® General-Purpose Mixers

- High speeds—up to 10,000 rpm
- Reliable mixer at an affordable price!

Our general-purpose mixer is ideal for routine, light-duty mixing—use with water-like viscosities only. This direct-drive mixer delivers speeds from 500 to 10,000 rpm.

Fuse protected, universal-type motor has a compact speed controller attached. This solid-state controller provides speed setting within a 20:1 speed adjustment range. The potentiometer controls both on/off and variable speed settings for single direction mixing.

**Mixer includes:** 3/8" dia x 12"L, 316 SS shaft, 1 1/2" dia propeller, 316 SS, 6"L x 1/2" dia mounting rod, chuck (accepts shafts from 5/16" to 3/8" dia), 6-ft, three-wire cord with plug.

**Mixer system includes all of the above plus:** double clamp, and support stand.

**Note:** Not recommended for fuming corrosive materials—use 04554-10 dual-shaft mixer instead.



General-purpose mixer 04554-00

Complete general-purpose mixing system 04554-50

**GO to page(s) 996-999**

Our full line of laboratory mixer accessories can be found on pages 996-999.

### Stir-Pak® Dual-Shaft Mixers

- Use for either high-speed or high-torque mixing
- Solid-state—gives you precise control of speed

Two motor shafts give you two mixers in one. The direct-drive shaft provides high-speed, low-viscosity mixing; switch to the gear-reduction shaft for your low-speed, high-viscosity mixing needs.

Rugged, permanent-magnet, totally enclosed nonventilated (TENV) motor has permanently lubricated ball bearings. Gear-shaft gear ratio is 20:1.

Our solid-state controller has been upgraded to maintain speed regulation better than ±2%—critical for materials that change viscosity as mixing progresses. Improved torque limiting feature protects against motor gear failure. Controller is totally enclosed and has an IP53 rating for protection against dust and water; it is UL-listed and CSA-approved. A 6-ft cord connects the controller and the motor.

**Mixer includes:** 6"L x 1/2" dia mounting rod, chuck (accepts shafts from 5/16" to 3/8" dia), and 6-ft, 3-wire cord with plug.

**Mixer system includes all of the above plus:** 3/8" dia x 24"L, 316 SS shaft, 3" dia propeller, 316 SS, double clamp, and support stand.



Dual-shaft mixer 04554-10 (gear shaft shown in use)

Complete dual-shaft mixing system 04554-60 shown with optional controller support platform 50001-90.

Controller is UL- and cUL-listed.



### Specifications & Ordering Information

Catalog number	Description	Speed	Max torque	Motor	Shaft size	Dimensions	Power	Price
<b>General-purpose mixers</b>								
KH-04554-00	Mixer	500 to 10,000 rpm	9.5 in-oz (up to 2000 rpm)	1/5 hp	5/16 to 3/8" dia	5 5/8"W x 4 1/4"H x 3 5/8"D	115 VAC 50/60	
KH-04554-50	Complete system							
<b>Dual-shaft mixers</b>								
KH-04554-10	Mixer	Direct-drive shaft: 50 to 5000 rpm	Direct-drive shaft: 4 in-oz	1/6 hp	5/16 to 3/8" dia	Motor: 5 3/4"L x 3 1/2" dia Controller: 7"W x 3 5/8"H x 4 7/8"D	115 VAC 50/60	
KH-04554-60	Complete system	Gear shaft: 3 to 250 rpm	Gear shaft: 80 in-oz					

### Accessories

**KH-04537-10 Shaft**, 3/8" dia x 24"L; 316 SS.

Accepts a 5/16" bore dia propeller

**KH-04553-68 Propeller**, 3" overall dia x 5/16" bore dia; 316 SS

**KH-01578-05 Transformer** for 230 VAC operation

**KH-50001-92 Mixer support stand** has a corrosion resistant base and 303 SS support rod. Rod measures 29"H x 5/8" dia. Both legs accept an extra support rod (sold separately)

**KH-50001-94 Extra support rod** for stand 50001-92

**KH-08041-22 Double clamp** for mounting the mixer head onto a stand; holds rods up to 7/8" dia

**KH-50001-90 Support platform** for mounting controller adjacent to mixer head (for mixer 04554-10)

## Cole-Parmer Digital Reversing Mixer

### Timed cycles save time and give repeatable and accurate results!

- Clockwise and counterclockwise rotation for a variety of mixing applications
- Reversing timed cycles to control vortexing and aeration
- Brushless DC motor maintains speeds at all viscosities

### Countdown Timer

The timer can be easily set on the 4-digit LED display using the "plus" and "minus" keys. You can set time from 2000 minutes (33 hours) to 1 minute in 1 minute increments. The mixer immediately stops when the timer reaches "0" and gives three beeps to alert it is complete.

### Reversing and Timed Cycles

The one-touch reversing feature allows your solutions to be thoroughly mixed faster by reversing the direction of the mixing element and giving a new mixing profile to the system. The timed cycle feature provides the ability to control vortexing and minimizes aeration of the solution by reversing between clockwise and counterclockwise stirring. The maximum cycle time is 2000 seconds (33 minutes) in increments of 1 second.

### Motor

This mixer touts a powerful 1/10-hp maintenance-free brushless DC motor that provides 142 in-oz of torque—enough power to mix solutions up to 20,000 cps or up to 6.6 gallons (25 liters). The through-shaft head and motor design allow easy impeller height adjustments and less downtime in between sample or impeller changes. The rpm of the motor is displayed and controlled to  $\pm 1$  rpm or 3% of the reading (whichever is greater) so you can be certain of repeatable and accurate mixing at all viscosities. To protect your mixer motor it is equipped with an overload protection system if the torque exceeds the mixer ratings. This mixer is ready to travel as it is designed for voltages inputs from 100 to 230 VAC so it is compatible in any part of the world via the power supply with interchangeable power plug.

### Sample Light

This simple yet innovative feature illuminates the mixing area to show how well the solution is being stirred so you can make adjustments to the speed, mixing directions, or impeller.

**Mixer includes:** mixer head, adjustable chuck (accepts rod up to 3/8" dia), chuck key, mounting support rod, external power supply, and grounded power cord.

**Complete system includes:** mixer 50004-00 and all components, mixer propeller/shaft 50801-62, support stand 50801-50, and support clamp 04561-24.

### Specifications & Ordering Information



Catalog number	Description	Speed range	Max torque	hp	Power (VAC, Hz)	Price
<a href="#">KH-50004-00</a>	Mixer only	40 to 2010 rpm	142 in-oz	1/10	100 to 230, 50/60	
<a href="#">KH-50004-10</a>	Complete system					

### Accessories

[KH-50801-62](#) Mixer propeller, 316 SS;

pitched 2 1/8"-dia blade, 5/16" dia x 16"L shaft

[KH-50801-51](#) Mixer impeller, 316 SS; compact

straight 1 1/4"-dia blade, 5/16" dia x 16"L shaft

[KH-50801-52](#) Mixer impeller, 316 SS; compact

square 1 1/2"-dia blade, 5/16" dia x 16"L shaft

[KH-50801-50](#) Mixer stand, 12" x 9 1/2" base

with a 3/8" dia x 24"L solid rod.....

[KH-04561-24](#) Heavy-duty clamp, secures to stand rods up to 1 1/8" dia. Made of cast zinc-aluminum with chemical-resistant epoxy coating

New



Sample light shows how well the solution is being stirred.



Complete system 50004-10 includes mixer, support stand, clamps, and mixer propeller



### Mixer Testing Beads

Test your mixer/impeller system for clumping and settling. These highly visible beads are calibrated to simulate particles in your fluid and let you easily visualize mixing patterns. Use both sizes simultaneously to determine effect on different sized particles.

Cat. no.	Color	Bead diameter	Price
<a href="#">EK-04560-70</a>	Red	4.5 mm	
<a href="#">EK-04560-71</a>	Yellow	3 mm	

# Mi Mixers

Laboratory

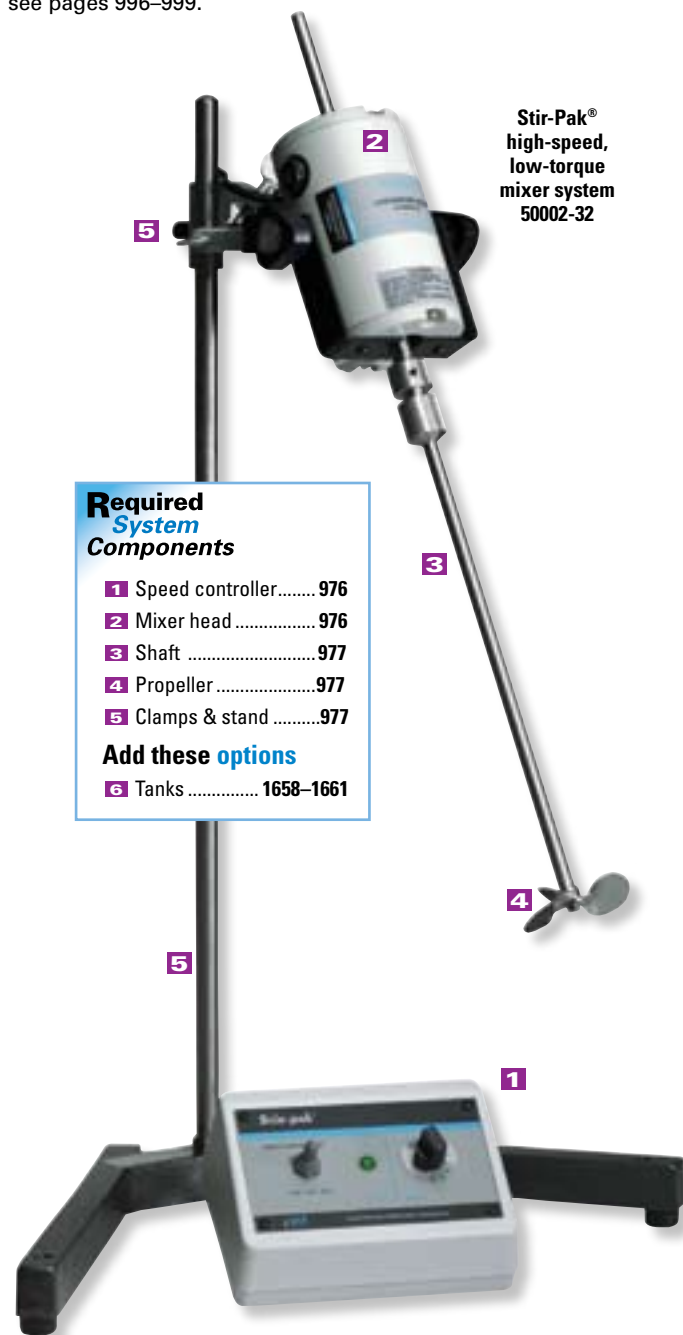
## Cole-Parmer® Stir-Pak® Heavy-Duty Mixer System

### Modular system for maximum versatility

- Choose from four mixer heads depending on your speed and torque requirements

Our modular Stir-Pak® heavy-duty mixer system allows you the flexibility to create the best system for your mixing applications. System components are sold separately, and as convenient, complete system packages—customize your own system or select one of ours (see listings at the bottom of page 977).

To customize your own system, simply start with a solid-state speed controller, add one of the four mixing heads depending on your speed and torque requirements, select a shaft and propeller, then choose from clamps and stands that best suit your application. For our full line of laboratory mixing accessories, see pages 996–999.



Stir-Pak®  
high-speed,  
low-torque  
mixer system  
50002-32

#### Required System Components

- 1 Speed controller..... 976
- 2 Mixer head ..... 976
- 3 Shaft ..... 977
- 4 Propeller ..... 977
- 5 Clamps & stand ..... 977

#### Add these options

- 6 Tanks ..... 1658–1661

### 1 Speed Controller

Solid-state controller offers precise speed control with a 100:1 adjustment range. A separate “forward/off/reverse” switch works independently from the speed control dial—allowing you to repeat mixer speed settings from one run to the next. Electronic control maintains speed regulation better than  $\pm 2\%$ . Torque limiting provides greater system protection and reduced motor gear failure. An LED indicates when power is on.

Remote controller is connected to the mixer head via a 6-ft, three-wire cord—protects electronics from hazardous spills or splashes. Controller measures 7"W x 3 $\frac{3}{16}$ "H x 4 $\frac{7}{8}$ "D.

**What's included:** 115 VAC model has a 6-ft cord with grounded plug. The 230 VAC model has an 8-ft cord with modular line cord and IEC320/CEE22 connector. When ordering, specify country of destination to receive correct line cord.

### Specs & Ordering Information

ISO9001:2000  
SUPPLIER CERTIFIED

cULus  
115 VAC only

Catalog number	Description	Power (VAC, Hz)	Price
<a href="#">KH-50002-02</a>	Stir-Pak® controller	115, 50/60	
<a href="#">KH-50002-07</a>		230, 50/60	

### 2 Mixer Heads

These rugged mixer heads feature TENV, permanent magnet DC motor with permanently lubricated ball bearing construction. Choose from four models depending on your desired speed and torque ranges.

The high-torque, low-speed models feature a Jacobs®-type chuck that accepts mixing shafts from  $\frac{5}{16}$ " to  $\frac{3}{8}$ " dia.

The high-speed, low-torque models incorporate a hollow through-shaft and a precision hand-tightened collet; collet accepts  $\frac{3}{8}$ " dia mixing shafts. The design lets you quickly position the mixing propeller at any depth within the container without moving the mixer head. The design also minimizes shaft “wobble” common at higher speeds and with longer shaft lengths.

All mixer heads are equipped with an integral adjustable-tilt mounting assembly that permits the rotation of the mixer head from 0 to 30° for proper placement of shaft and propeller. Heads measure approximately 11 $\frac{1}{2}$ "H x 3 $\frac{5}{8}$ " dia.

### Specs & Ordering Information

ISO9001:2000  
SUPPLIER CERTIFIED

2 year  
warranty

Catalog number	Speed (rpm)	Max torque	hp	Power (VAC, Hz)	Price
<b>High torque, low speed; Jacobs®-type chuck</b>					
<a href="#">KH-50002-10</a>	2 to 180	340 in-oz	$\frac{1}{15}$	115, 50/60	
<a href="#">KH-50002-15</a>				230, 50/60	
<a href="#">KH-50002-20</a>	9 to 900	70 in-oz	$\frac{1}{15}$	115, 50/60	
<a href="#">KH-50002-25</a>				230, 50/60	
<b>High speed, low torque; adjustable through-shaft collet</b>					
<a href="#">KH-50002-30</a>	23 to 2300	45 in-oz	$\frac{1}{10}$	115, 50/60	
<a href="#">KH-50002-35</a>				230, 50/60	
<a href="#">KH-50002-40</a>	60 to 6000	17 in-oz	$\frac{1}{10}$	115, 50/60	
<a href="#">KH-50002-45</a>				230, 50/60	



Controller 50002-02  
meets IP53 rating for  
dust and water.



### 3 Mixing Shafts

Shafts are 316 stainless steel. All  $\frac{3}{8}$ " dia shafts are machined on one end to accept a  $\frac{5}{16}$ " bore dia propeller.

Catalog number	Shaft dimensions	Price
<a href="#">KH-04553-50</a>	$\frac{5}{16}$ " dia x 12"L	
<a href="#">KH-04553-55</a>	$\frac{5}{16}$ " dia x 18"L	
<a href="#">KH-04553-52</a>	$\frac{3}{8}$ " dia x 12"L	
<a href="#">KH-04553-57</a>	$\frac{3}{8}$ " dia x 18"L	
<a href="#">KH-04537-10</a>	$\frac{3}{8}$ " dia x 24"L	
<a href="#">KH-04538-10</a>	$\frac{3}{8}$ " dia x 30"L	

### 4 Propellers

Use these three-bladed propellers for your general-purpose mixing. Use singly, or mount several on a shaft for thorough agitation. All have  $\frac{5}{16}$ " bore diameter.

Catalog number	Overall diameter	Price
<a href="#">KH-04553-60</a>	1"	
<a href="#">KH-04553-62</a>	1½"	
<a href="#">KH-04553-64</a>	2"	
<a href="#">KH-04553-68</a>	3"	

### 5 Clamps, Stands, and Supports

**KH-50001-80 Tank clamp** lets you mount a mixer head and a controller support (either model 50001-82 or 50001-90) directly onto an open top drum or container (maximum 1½" wall thickness)

**KH-08041-22 Double clamp** for mounting the mixer head onto a stand; holds rods up to  $\frac{7}{8}$ " dia

**KH-50001-92 Support stand** has an electropolished cast steel base and 303 SS support rod measuring 29"H x  $\frac{5}{8}$ " dia. Both legs of base accept an optional screw-in support rod

**KH-50001-94 Optional screw-in support rod** for 50001-92 stand

**KH-50001-82 Pivot-mount controller support** secures onto the controller. A hinged rod lets you adjust the controller for easy access from various angles. Includes a dual-rod clamp

**KH-50001-90 Controller support platform.** Mount your controller adjacent to your mixer head. Rack-mount  $\frac{1}{2}$ " dia rod fits into a dual-rod clamp (included) or use with our tank clamp 50001-80 (sold above)



High-torque, low-speed mixer heads have Jacobs®-type chuck.



#### Mixer Testing Beads

Test your mixer/impeller system for clumping and settling—see page 997.



High-speed, low-torque mixer heads have through-shaft precision collet.

#### Complete Stir-Pak® Mixer Systems

These convenient, ready-made systems come complete with a mixer head, controller, shaft 04537-10, propeller 04553-68, clamp 08041-22, and stand 50001-92. Choose the system that best meets your mixing speed, torque and power requirements.

**KH-50002-22 Stir-Pak® high-torque, low-speed mixer system;** 115 VAC, Jacobs®-type chuck. Includes speed controller 50002-02 and mixer head 50002-20

**KH-50002-27 Stir-Pak® high-torque, low-speed mixer system;** 230 VAC, Jacobs®-type chuck. Includes speed controller 50002-07 and mixer head 50002-25

**KH-50002-32 Stir-Pak® high-speed, low-torque mixer system;** 115 VAC, adjustable through-shaft collet. Includes speed controller 50002-02 and mixer head 50002-30

**KH-50002-37 Stir-Pak® high-speed, low-torque mixer system;** 230 VAC, adjustable through-shaft collet. Includes speed controller 50002-07 and mixer head 50002-35

Choose from these complete Stir-Pak® mixer systems!

# Mi Mixers

Laboratory

## Cole-Parmer® Modular Digital Reversing Mixer

Same great features as our Digital Reversing Mixer (on page 975)!

- Countdown timer
- Reversing and timed cycles
- Heavy-duty motor
- Sample light

### PLUS!

- Remote controller
- IP56 rating on both mixer head and remote controller
- Multiposition bracket for standing, hanging, or affixing to metal surfaces with magnets
- Two speed ranges up to 4000 rpm or maximum torque of 142 in-oz
- Lockout feature prevents inadvertent setting changes

Use the full-function, pendant remote controller to increase the speed, start/stop, set the timer, reverse the direction of the motor and even turn on the sample light. This controller, as well as the mixer head, meets IP56 ratings so it will be able to withstand the occasional splashes and spills. The versatile remote controller can be detached from the mixer head in situations where a remote is not needed.

Controller design features include comfortable ergonomic handheld design, multiposition stand/hook, and multiple-cord management. The multiposition stand/hook allows for vertical or horizontal orientation resting on a countertop with a simple change in the direction of the stand. The stand bracket also doubles as a hook to hang the controller on lab lattice, clamp, or any other straight bar up to 3/4" in diameter and minimum length of 3". Two button magnets on the back of the controller affix to metal surfaces like fume hoods and cabinets. Built-in cord management feature a track along the back to allow the remote cord to be channeled out of the top, left bottom, right bottom, or center bottom of the controller.

Control lockout feature is available either via the remote control or from the integrated controls on the mixer head by simply holding the start/pause button for 8 seconds. This locks out all controls to prevent inadvertent speed or timer changes. The power button operates while in lockout mode for an emergency stop, and the integrated mixing light can be turned on and off to view the samples being stirred.

### What's included:

**Mixer only:** mixer head, remote pendant controller with 6-ft cord, adjustable chuck (accepts rod up to 3/8" dia), chuck key, mounting support rod, external power supply, and grounded power cord and plug assembly.

**Mixer system:** mixer 50005-00 (-10) and all components, mixer propeller/shaft 50801-62, support stand 50801-50, and support clamp 04561-24.



Multiposition stand/hook for vertical or horizontal standing, or hang from lab lattice with the versatile hook



Mixer system includes mixer and components, shaft, propeller, stand, and clamp.



Remote controller face



Safely adjust mixer setting without opening the fume hood.

### Specifications & Ordering Information

Catalog number	Description	Speed range (rpm)	Max torque	hp	Power (VAC, Hz)	Price
EK-50005-00	Mixer	40 to 2000	142 in-oz	1/10	100 to 230, 50/60	
EK-50005-50	Complete system					
EK-50005-10	Mixer	80 to 4000	74 in-oz	1/10		
EK-50005-60	Complete system					

### Accessories

**EK-50801-62 Mixer propeller**, 316 SS; pitched 2 1/8"-dia blade, 5/16" dia x 16"L shaft

**EK-50801-51 Mixer impeller**, 316 SS; compact straight 1 1/4"-dia blade, 5/16" dia x 16"L shaft

**EK-50801-52 Mixer impeller**, 316 SS; compact square 1 1/2"-dia blade, 5/16" dia x 16"L shaft

**EK-50801-50 Mixer stand**, 12" x 9 1/2" base with a 5/8" dia x 24"L solid rod

**EK-04561-24 Heavy-duty clamp**, secures to stand rods up to 1 1/8" dia. Made of cast zinc-aluminum with chemical-resistant epoxy coating



## Cole-Parmer Servodyne Electronic Mixers

### Modular design gives full mixing versatility

- Monitor and control speed, torque, and batch time through a computer interface
- Permanent-magnet DC motor with permanently lubricated ball-bearing construction for maintenance-free operation

### Controller

Provide precise control of mixing speed within  $\pm 0.2\%$  despite changes in viscosity, temperature, or line voltage. Monitor torque, set torque limits, or measure and control differential torque with mixer head in use and sets the appropriate rpm and torque limits for that motor. Controller measures 6½"W x 3½"H x 7¾" D. Operates on 115 VAC, 50/60 Hz. Controller includes a 6-ft modular line cord with IEC320/CEE22 connector; specify country of final destination to receive correct line cord.

### Mixer Heads

Optical shaft encoder relays the exact motor rotation speed data to the electronic mixer controller. Adjustable-tilt mounting assembly permits rotation of mixer head from 0° to 30° for proper positioning of shaft and propeller. Mixer heads include a chuck/collet (depending on the model), 5-ft L x ½"-dia mounting rod, and 6-ft multiconductor cable to connect to the controller. The high-torque, low-speed models have a Jacobs®-type precision chuck that accepts mixing shafts up to ⅜" in diameter. The high-speed, low-torque models have an adjustable, through-shaft precision hand-tightened collet that accepts ⅜"-dia mixing shafts. Through-shaft design allows positioning the mixing propeller at any depth without moving the mixer head—minimizes shaft "wobble" that occurs at higher speeds or with longer shafts.

### Complete Systems

These convenient, ready-made systems come complete with controller, mixer head, shaft, propeller, clamp, and stand.

### Optional Computer Software and Cables

Controller allows mixer system to be monitored and controlled via computer interface. Software program lets you control up to 16 Servodyne mixers and Masterflex® computer-compatible pump drives (see pages 1264–1290 for compatible pump drives).

### Required System Components

- 1 Mixer controller 2 Mixer head  
3-4 Shaft & Propeller (see page 977)  
5 Clamps & stand (see page 977)

### Add these options

- 6 Software/cables



Servodyne  
low-speed,  
high-torque  
mixer system  
50003-22

### Specifications & Ordering Information

ISO9001:2000  
SUPPLIER CERTIFIED 2 year warranty

Controller		Mixer heads						Complete systems		
Catalog number	Price	Catalog number	Description	Speed range (rpm)	Max torque (in-oz)		hp	Price	Catalog number	Price
					Continuous	Intermittent				
KH-50003-00		KH-50003-10	High torque,	3 to 180	340	510	1/15		—	—
		KH-50003-20	low speed	20 to 900	70	105	1/15			
		KH-50003-30	High speed,	60 to 2300	45	65	1/10			
		KH-50003-40	low torque	150 to 6000	17	25	1/10			

**Computer Software and Cable.** Monitor and control your Servodyne mixer system from an IBM® or compatible computer via computer interface. Software program lets you control up to 16 Servodyne mixers and Masterflex® computer-compatible pump drives. Various application programs let you dedicate your automated setup for mixing and diluting, sequence control, flow proportioning, reversible batch dispensing, delivering single and multiple slope gradients, or customizing procedures for specialized applications.

**KH-07550-74 Software for Windows®** v3.1 or later, CD-ROM format. Requires RS-232 cable 07550-64 below

**KH-07550-64 RS-232 interface cable**, 8-ft long. Connects Servodyne mixer system to a PC. RJ11 to DB25 connection; includes DB25/DB9 adapter



### Electronic Mixer Controller Features

- A. Display:** shows selected mixing time, mixing time remaining, rpm, and torque values.
- B. Time:** Starts counting down when the START key is pressed.
- C. Rpm:** Displays the last adjusted mixer shaft speed.
- D. Torque:** Displays current torque value (oz-in for 115 VAC model, kg-cm for 230 VAC model) and high and low torque limits.
- E. Torque zero:** Lets you zero the torque when propeller is running in free air or in a reference fluid.
- F. Start:** Operates the mixer shaft. Stops when countdown reaches zero.
- G. Stop:** Press at any time to stop rotation of the mixer shaft.
- H. Up/down arrow keys:** Adjust TIME, RPM, and TORQUE parameters.
- I. LEDs** indicate the function being displayed.

# Mi Mixers

## Laboratory

### Low-Cost Laboratory Mixers

#### Continuous duty mixers with overload protection

**A Single-Shaft, Fixed-Speed Mixer** has 1/30-hp, shaded-pole, brushless motor with built-in fan providing a shaft speed of 1600 rpm. Unit is protected by thermal-overload cutoff.

**B Light-Duty, Single-Shaft Variable-Speed Mixer** blends up to 5 gallons of water-like (low-viscosity) fluids—ideal for use with baths. Mixer features stepless speed control.

**C High-Speed, Single-Shaft Variable-Speed Mixer** lets you easily prepare emulsions and suspensions. The remote, stepless speed controller is attached to the mixer via a 3 1/2-ft cord.

**D Light-Duty, Dual-Shaft Variable-Speed Mixer** mixes up to 5 gallons of water-like fluids with the direct-drive shaft; or use the gear-reduced drive shaft to mix up to 2 gallons of fluids with the viscosity of lightweight oil. Features stepless speed control.

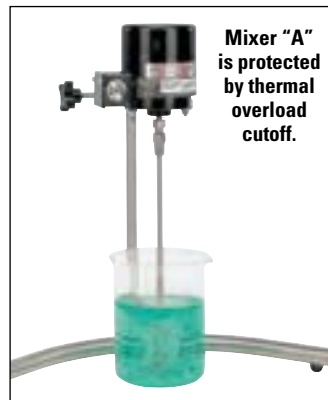
**E Light-Duty, Single-Shaft Variable-Speed Mixer** blends up to 5 gallons of water-like (low-viscosity) fluids—ideal for use with baths. Mixer features stepless speed control.

**F Medium-Duty, Dual-Shaft Variable-Speed Mixer** features a direct-drive shaft to prepare emulsions and suspensions. Or use the gear-reduced shaft to mix glues and oils. The remote speed controller is attached to the mixer via a 3 1/2-ft cord.

**G High-Torque, Dual-Shaft Variable-Speed Mixer** handles your tough mixing applications—features speeds up to 7500 rpm and torque up to 192 in-lb.

**H Heavy-Duty, Variable-Speed Mixer** features a 1/4-hp motor for mixing highly viscous fluids. This mixer includes a heavy-duty jumbo holder.

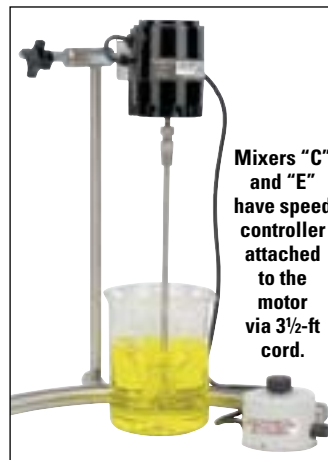
**What's included:** Chuck, 8 1/2" L x 1/2" dia mounting rod, and 6-ft, three-wire cord with plug. For 230 VAC operation, order transformer below.



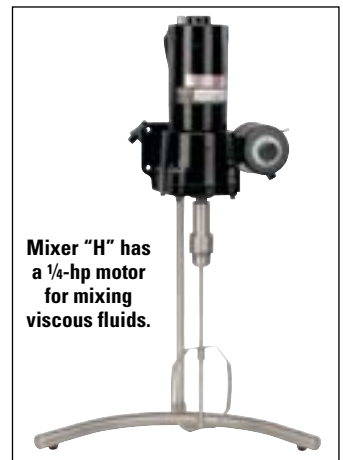
Mixer "A" is protected by thermal overload cutoff.



Mixers "B", "D", "F" and "G" have speed controller mounted above the motor.



Mixers "C" and "E" have speed controller attached to the motor via 3 1/2-ft cord.



Mixer "H" has a 1/4-hp motor for mixing viscous fluids.

#### Specifications & Ordering Information

Key	Catalog number	Description	Speed (rpm)	Torque (in-oz)	hp	Drive type	Motor type	Shaft diameter	Power (VAC, Hz)	Price
<b>Fixed-speed mixer</b>										
<b>A</b>	<a href="#">KH-04322-00</a>	High-torque, single-shaft	1600	20.8	1/30	Direct	Fan-cooled, shaded pole, brushless	5/16"	120 50/60	
<b>Variable-speed mixers</b>										
<b>B</b>	<a href="#">KH-04335-00</a>	Light-duty, single-shaft	500 to 7500	2.4	1/5	Direct	Universal with enclosed fan	1/4"	120 50/60	
<b>C</b>	<a href="#">KH-04325-00</a>	High-speed, single-shaft	1000 to 7500	11.2	1/2	Direct	Universal with enclosed fan	5/16"	120 50/60	
<b>D</b>	<a href="#">KH-04330-00</a>	Light-duty, dual-shaft	500 to 7500 50 to 750	2.4 16	1/5	Direct 10:1	Universal with enclosed fan	5/16"	120 50/60	
<b>E</b>	<a href="#">KH-04340-30</a>	Light-duty, single-shaft	500 to 7500 50 to 750 10 to 125	0.5 4.7 15	1/6	Direct 10:1 60:1	Universal with enclosed fan	5/16"	120 50/60	
<b>F</b>	<a href="#">KH-04340-00</a>	Medium-duty, dual-shaft	1000 to 7500 100 to 750	8 75.2	1/8	Direct 10:1	Universal-with enclosed fan	5/16"	120 50/60	
<b>G</b>	<a href="#">KH-04341-00</a>	High-torque, dual-shaft	500 to 7500 50 to 750	19.2 192	1/6	Direct 10:1	Permanent-magnet	5/16"	120 50/60	
<b>H</b>	<a href="#">KH-04340-10</a>	Heavy-duty	50 to 500	400	1/4	10:1	Permanent-magnet	3/4"	120 50/60	

#### Accessories for all mixers on this page

[KH-04553-55](#) Shaft, 5/16" dia x 18"L; 316 stainless steel (SS)

[KH-04553-68](#) Propeller, 3" dia x 5/16" bore dia; 316 SS

[KH-04449-07](#) Paddle assembly, 1/4" dia x 18"L; 2" dia paddle; 303/304 SS

[KH-08041-22](#) Double-rod clamp

[KH-50001-92](#) Mixer stand, 29"H x 5/8" dia

#### GO to page(s) 996-999

Our full line of laboratory mixer accessories can be found on pages 996-999.

#### Transformers for 230 VAC operation

Catalog number	For use with mixers	Price
<a href="#">KH-01578-02</a>	D	
<a href="#">KH-01578-05</a>	B, C	
<a href="#">KH-01578-06</a>	A, E, F, G	

#### Replacement Chucks

Catalog number	For use with mixers	Price
<b>Collet</b>		
<a href="#">KH-04556-50</a>	B	
<a href="#">KH-04558-50</a>	A, C, D, E	
<b>Adjustable</b>		
<a href="#">KH-04558-01</a>	F, G	
<a href="#">KH-04340-90</a>	H	

## Dual-Shaft Mixer

### Two shafts provide both low- and high-speed mixing

This continuous-duty dual-shaft mixer maintains constant speed regardless of changes in viscosity or line voltage. Use the direct-drive shaft for high-speed mixing of low-viscosity fluids; switch to 12:1 reduction gear shaft for low-speed mixing of high-viscosity fluids.

The totally enclosed motor is equipped with permanently lubricated bearings. Built-in drive current filters eliminate pulsing, reduce motor heating, and increase service life. Remote controller is connected to the motor via a 6-ft insulated cable and features a forward/off/reverse switch, a stepless speed control dial, and "power on" indicator light.

**What's included:** two 304 SS paddle assemblies (1½" dia and 2¾" dia propellers on 8¾"L shafts), keyless chuck (accepts up to ⅜" [10-mm] dia shafts), dual-rod clamp, 8"L x ⅛" dia mounting rod, and 6-ft, three-wire power cord (115 VAC model includes plug).

### Specifications & Ordering Information

#### Speed range

Direct-drive shaft: 0 to 4000 rpm  
12:1 gear shaft: 0 to 333 rpm

#### Max torque

Direct-drive shaft: 4.16 in-oz  
12:1 gear shaft: 57.6 in-oz

Catalog number	hp	Dimensions (W x H x D)		Power (VAC, Hz)	Price
		Motor	Controller		
<a href="#">KH-04661-00</a>	¼	4⅜" x 5½" x 4⅜"	8¼" x 3¾" x 6¼"	115, 50/60	
<a href="#">KH-04661-02</a>				230, 50/60	

**KH-04368-10 Mixer stand.** Rod measures 24"H x ⅛" dia; base features suction-cup feet

**KH-50001-90 Controller support platform.** Mount controller adjacent to mixer head. Platform includes dual-rod clamp

## Mixers with Speed/Torque Readout

### Maintain constant speed and torque throughout the speed range

- X-Y recorder output for charting and calibrating speed and torque

Electronically monitor and record speed and torque. These mixer systems are ideal for polymer chemistry—gather data on viscosity profiles, shear rate and shear stress, starting torque for plastic materials, flocculation points, and more.

All mixers come with a power supply/controller that provides filtered DC power for the motor, changing the voltage as necessary. Maintain constant shaft speed and torque within ±1% of preset values under varying line voltage conditions. Obtain torque readings with a simple flip of a switch.

Permanent magnet, ball-bearing, totally enclosed DC motor has oversized brushes and skewed armature to avoid cogging at low speeds. A fast-acting circuit breaker protects components even if the motor is stalled.

Recorder output is nonisolated from AC lines for both speed and torque (1 mV/rpm; 10 mV/in-oz for direct-drive mixers and 1 mV/in-oz for gear-drive mixers) and cannot be grounded. Order isolation transformer separately from "Accessories". Hook up to an X-Y recorder to draw calibration curves for viscosity. See page 1454 for recorders. Input impedance of recorder must be at least 100 kΩ. Order connecting cable 04406-50 from "Accessories" below right.

Mixers with optional torque limit control, higher torque, and different speed ranges are available—call our Application Specialists or go to [ColeParmer.com](http://ColeParmer.com) for details.

**Direct-drive mixers 04406-10, -12 include:** two 304 SS paddle assemblies (1½" and 2½" propellers on 8¾"L shafts—see picture at right). **Direct-drive mixers 04406-00, -02, 20, -22 and gear-drive mixers include:** 304 SS paddle assembly (6" propeller x 12"L shaft).

**All include:** chuck, 8"L x ⅝" dia mounting rod, heavy-duty clamp, and 5-ft cord with three-prong plug.

### Specifications & Ordering Information

Speed (rpm)	Maximum torque	Dimensions (W x H x D)	hp	115 VAC (50/60 Hz)		230 VAC (50/60 Hz)	
				Cat. no.	Price	Cat. no.	Price
<b>Direct-drive mixers</b>							
20 to 2500	1600 g-cm*	3¾" x 7" x 3¾"	⅛	<a href="#">KH-04406-10</a>		<a href="#">KH-04406-12</a>	
	50 in-oz	5½" x 9½" x 5⅝"	⅛	<a href="#">KH-04406-00</a>		<a href="#">KH-04406-02</a>	
	100.8 in-oz	5" x 10⅝" x 5"	¼	<a href="#">KH-04406-20</a>		<a href="#">KH-04406-22</a>	
<b>Gear-drive mixers, 10:1</b>							
2 to 250	336 in-oz	5⅝" x 9½" x 5⅝"	⅛	<a href="#">KH-04407-00</a>		<a href="#">KH-04407-02</a>	
	720 in-oz	5" x 10⅝" x 5"	¼	<a href="#">KH-04407-20</a>		<a href="#">KH-04407-22</a>	

\*Equals 22.2 in-oz. Meter reads in g-cm.

Mixer 04661-00 shown with mixer stand 04368-10 (sold separately)

Mixing paddle assemblies included



Direct-drive mixers 04406-10 (left) and 04406-00 (right)



Paddle assemblies included with 04406-10 and -12



Power supply/controller displays speed or torque with the flip of a switch.



**KH-04406-50** Connecting cable for X-Y recorder hookup, 5-ft L

**KH-04406-70** Isolation transformer for mixer 04406-10 only

**KH-04406-60** Isolation transformer for mixers 04406-00, -20 and 04407-00, -20

**KH-04546-00** Mixer stand has a cast-iron base and a stainless steel rod. Rod measures 24"H x ⅝" dia

# Mi Mixers

## Laboratory

### Economical Constant-Torque Mixers

Electronically controlled mixers with DC motor maintain constant torque throughout entire speed range

- Totally enclosed nonventilated motors seal out fumes and dust
- Manually resettable circuit breaker protects against overload
- Integrated control box features speed dial and on/off switch

**A Light-Duty Mixer** is engineered for mixing smaller batches of light to medium-light viscosity fluids at high speeds.

**B General-Purpose Mixer** is specifically designed to handle medium-viscosity fluids for a wide range of applications.

**C High-Torque, Constant-Speed Mixer** provides up to 117.6 in-oz of torque with the 7:1 reduction gear. The specially designed gear head maintains constant rotational speed regardless of viscosity changes as mixing progresses—ideal for pseudoplastic or thixotropic fluids.

**A-C Mixers include:** 3/8" dia x 12"L, 316 SS shaft, 2 1/2" dia, 316 SS propeller, collet, 10"L x 3/16" dia alum. mounting rod, and 6-ft, 3-wire cord with plug (115 VAC models); for 220 VAC models, specify destination country for correct cord.

**D Heavy-Duty, Reversible Mixer** has a 1/8-hp, reversible motor for manually switchable forward or reverse rotation. Use this mixer for larger batches of medium- to high-viscosity fluids at moderate speed. Mixer also features an ampere meter to help you select the maximum speed without the danger of circuit overload—simply keep the indicator in the "green" range for safe, continuous operation.

**What's included:** 3/8" dia x 12"L, 316 SS shaft, 4 1/4" dia, 316 SS propeller, collet, 10"L x 3/8" dia aluminum mounting rod, and 6-ft, three-wire cord with plug.

**E Continuous Agitation Mixer** provides instant, automatic forward-and-reverse rotation for thorough mixing without vortexing. The resulting highly efficient action keeps material in homogeneous suspension and minimizes formation of air bubbles. Variable reversing time cycle allows you to set the cycle time from 2 to 20 seconds. You can also use this unit as a regular mixer by turning off the reversing action. The direct-drive motor is specially designed to handle viscous fluids.

**What's included:** 3/8" dia x 12"L 316 SS shaft, 2 1/2" dia 316 SS propeller, collet, 10"L x 3/16" dia mounting rod, and 6-ft, three-wire cord with plug.



### Specifications & Ordering Information



Catalog number	Speed (rpm)	hp	Constant torque	Drive type	Drive (W x H x D)	Shaft (L x dia)	Power (VAC, Hz)	Price
<b>A Light-duty mixer</b>								
<a href="#">KH-50402-00</a>	0 to 6000	1/10	16.8 in-oz	Direct	4" x 7 1/2" x 4 1/2"	3/8" x 12"L	115, 60	
<a href="#">KH-50402-05</a>							220, 50	
<b>B General-purpose mixer</b>								
<a href="#">KH-50402-10</a>	0 to 2000	1/15	39 in-oz	Direct	4" x 7 3/4" x 4 1/2"	3/8" x 12"L	115, 60	
<a href="#">KH-50402-15</a>							220, 50	
<b>C High-torque, constant-speed mixer</b>								
<a href="#">KH-50402-20</a>	0 to 1000	1/10	117.6 in-oz	7:1 gear head	4" x 10 1/4" x 4 1/2"	3/8" x 12"L	115, 60	
<a href="#">KH-50402-25</a>							220, 50	
<b>D Heavy-duty, reversible mixer</b>								
<a href="#">KH-50402-30</a>	2 to 2000	1/8	74 in-oz	Direct	4 1/2" x 10 9/16" x 5 1/4"	3/8" x 12"L	115, 60	
<b>E Continuous agitation mixer</b>								
<a href="#">KH-50403-00</a>	0 to 2000	1/15	39.8 in-oz	Direct	4 1/2" x 8 3/4" x 5 1/4"	3/8" x 12"L	115, 60	

**Accessories** for all mixers on this page

[KH-04560-24 Heavy-duty dual clamp](#) for affixing mixer mounting rod to mixer stand

[KH-50001-92 Mixer stand](#) is made of corrosion-resistant, electropolished cast steel. Both legs accept an extra support rod. Stand measures 29"H x 5/8" dia

[KH-50001-94 Extra support rod](#) for stand 50001-92 above, 303 SS

[KH-04553-57 Shaft](#), 3/8" dia x 18"L; 316 SS. Accepts a 5/16" bore dia propeller

[KH-04537-10 Shaft](#), 3/8" dia x 24"L; 316 SS. Accepts a 5/16" bore dia propeller

[KH-04553-64 Three-blade propeller](#) for general-purpose mixing; 2" dia, 5/16" bore, 316 SS



At 1100 rpm, without the forward-and-reverse rotation, mixers cause vortexing and aeration, which can interfere with your process.



At 1100 rpm, with forward-and-reverse rotation the continuous agitation mixer mixes efficiently and dynamically without unwanted aeration.

## Compact Digital Lab Mixer

Use virtually anywhere—compact design and panel light make it perfect for enclosed workstations or fume hoods!

This mixer provides accurate and repeatable results every time. The brushless DC motor maintains power at all speeds and has automatic overload protection, so you can stir bigger batches longer. The belt driven transmission is smooth and quiet, and offers high-power efficiency. Stir up to 6.6 gallons (25 liters), and a maximum viscosity of 15,000 cps. The splash-proof sealed housing keeps liquids and moisture out—good for aggressive environments. The through-shaft design makes adjustments easy and decreases downtime due to impeller changes. Adjustable chuck accommodates up to  $\frac{3}{8}$ " diameter impeller shaft.

Mixer features an integrated lighting system for illuminating solutions so they can be clearly seen. The four-button control (power on/off, speed increase/decrease, light on/off) makes this mixer extremely easy to use. Comes with ergonomic handle for easy moving. Order stand, clamp, and mixing impellers separately. Measures 3"W x 9½"H x 6"D.

**What's included:** Jacobs® chuck (accepts up to  $\frac{3}{8}$ " dia shafts) and key, 5"L x ½" dia mounting rod, external power supply, and 10-ft power cord with three-prong plug.

### Specifications & Ordering Information

**Accuracy:** ±1 rpm or 3% of reading

CE 2 year warranty

Catalog number	Speed	Max torque	hp	Power	Price
<a href="#">KH-50801-00</a>	40 to 2000 rpm	100 in-oz	1/15	120/230 VAC, 50/60 Hz	

[KH-50801-50](#) Mixer stand, 12" x 9½" base with  $\frac{5}{8}$ " dia x 12"L SS solid rod

[KH-50801-51](#) Mixer impeller, straight blade,  $\frac{5}{16}$ " dia x 16" SS shaft; 1¼" dia blade

[KH-50801-52](#) Mixer impeller, square blade,  $\frac{5}{16}$ " dia x 16" SS shaft; 1¼" dia blade

[KH-50801-54](#) Mixer impeller, anchor paddle,  $\frac{5}{16}$ " dia x 16" SS shaft; 2"W x 2"H paddle

[KH-04561-24](#) Heavy-duty clamp holds rods up to 1½" dia. Made of SS with chemical-resistant epoxy coating



Light illuminates vessel and fluid being mixed

50801-00

## Real-Torque Digital™ Brushless Mixers

Newly redesigned mixer brings added safety—chuck guard encloses spinning chuck

- Maintenance-free operation
- Set speed maintained as fluid viscosity changes

The unique, two-speed transmission delivers constant performance under changing conditions. Mixers feature a sparkless, brushless DC motor that provides a long, maintenance-free service life. The totally enclosed non-ventilated motor is rated for continuous duty. Overload protection automatically shuts off the mixer if maximum torque is exceeded—an LED light signals overload conditions. The through-shaft design lets you easily alter shaft length and propeller depth. Mixers have an aluminum alloy housing.

Models are available with built-in infrared interface for remote, wireless control and datalogging from your PC (Windows® compatible). Remote package includes mixer with enhanced circuitry, software, infrared transmitter, and installation instructions.

**What's included:** calibration certificate, stainless steel Jacobs® chuck and key (accepts up to  $\frac{3}{8}$ " dia shafts), chuck guard, 5"L x ½" dia mounting rod, and 6-ft cord with three-prong plug.

### Specifications & Ordering Information

**Motor:** ½ hp **Dimensions:** 8"L x 4"W x 9"H

SP CE 3 year warranty

Catalog number	Speed range (torque)		Power (50/60 Hz)	Price
	Low speed	High speed		
<b>Standard mixers</b>				
<a href="#">KH-50800-00</a>	20 to 360 rpm (800 in-oz)	360 to 1800 rpm (160 in-oz)	115 VAC	
<a href="#">KH-50800-05</a>			230 VAC	
<a href="#">KH-50800-10</a>	30 to 600 rpm (480 in-oz)	600 to 3000 rpm (96 in-oz)	115 VAC	
<a href="#">KH-50800-15</a>			230 VAC	
<a href="#">KH-50800-20</a>	60 to 1200 rpm (240 in-oz)	1200 to 6000 rpm (48 in-oz)	115 VAC	
<a href="#">KH-50800-25</a>			230 VAC	

[KH-04561-24](#) Heavy-duty clamp, holds rods up to 1½" (30 mm) dia Made of 304 SS with chemical-resistant epoxy coating

[KH-50001-93](#) Mixer safety stand. Cast zinc-aluminum base has chemical-resistant epoxy coating. The 304 SS rod measures 28"H x 1" dia



Chuck guard for added protection

Mixer 50800-10 shown with A-shaped paddle assembly, clamp, and stand

**A-Shaped Paddle Assemblies** of 304 SS. Ideal for your large-volume or high-viscosity mixing. Shafts measure  $\frac{3}{8}$ " dia x 17"L.

Catalog number	Paddle diameter	Price
<a href="#">KH-50801-64</a>	4"	
<a href="#">KH-50801-66</a>	5"	
<a href="#">KH-50801-68</a>	10"	

# Mixers

## Laboratory

### Laboratory Mixers

#### Reliable, variable-speed mixers feature wide-range stepless speed control

Brushless motors have sealed, lubricated bearings for long, virtually maintenance-free service life. All mixers are rated for continuous-duty operation and are thermal-overload protected for extra safety.

Models "A" and "C" feature enclosed but vented motors; models "B" and "D" feature totally enclosed, fan-cooled (TEFC) motors for safe, smooth, and vibrationless operation. All models have through-shaft design, enabling you to accommodate a variety of mixing vessels with a single shaft. You can also easily adjust propeller depth for optimum mixing efficiency.

**GO to page(s) 996-999**

See pages 996-999 for our full line of laboratory mixer accessories.

#### A Economical, Dual-Range Mixer

This economical mixer features two shafts to switch from the low-speed range to the high-speed range. The  $\frac{1}{40}$ -hp motor provides up to 142 in-oz of torque at the lowest speed setting.

#### B Standard and High-Torque, Dual-Range Mixers

These dual-range mixers provide high torque at low speeds making them ideal for mixing highly viscous liquids. Standard models 04400-04 through -10 are lightweight and compact for easy handling. Models 04400-08 through -14 feature digital display to easily reproduce speed settings.

#### C Medium-Duty, Dual-Range Mixer

Convenient side-mounted switch lets you select the low-speed range or the high-speed range—change the speed range in standstill or operating mode. Then use the front-panel knob to adjust speed within the selected range.

#### D Constant-Speed Mixers

Two-stage gearboxes help maintain constant speed regardless of viscosity changes—ideal for pseudoplastic or thixotropic fluids. The electronic controls allow constant torque over a wide range of speeds. View both torque and speed on the digital display. Use the RS-232 interface to record speed and torque, and preset speed. The analog output (0 to 10 V or 4 to 20 mA) lets you send speed and torque data to a recorder. Available in single-range or dual-range models.

**All mixers include:** Jacobs®-type chuck,  $\frac{1}{2}$ " dia mounting rod (6"L for models "B" and "D"; 12"L for models "A" and "C"), and 6 $\frac{1}{2}$ -ft cord with three-prong plug.



#### Specifications & Ordering Information



Key	Catalog number	Description	Speed (rpm)	hp	Max torque	Max mixing shaft dia*	Power (VAC, Hz)	Price	
A	KH-04400-00	Economical, dual-range, cone drive, no LED	40 to 315;	$\frac{1}{40}$	142 in-oz	$\frac{5}{16}$ " (8.0 mm)	115, 60		
	315 to 2700		230, 50						
B	KH-04400-04	Standard, dual-range gear-driven, no LED	40 to 400;	$\frac{1}{30}$	567 in-oz	$\frac{3}{8}$ " (10.0 mm)	115, 60		
	KH-04400-06		200 to 2000				230, 50		
	KH-04400-08	Standard, dual-range gear-driven, LED	40 to 400;	$\frac{1}{30}$	567 in-oz	$\frac{3}{8}$ " (10.0 mm)	115, 60		
	KH-04400-10		200 to 2000				230, 50		
	C	KH-04405-10	Medium-duty, dual-range, hemispherical, no LED	40 to 400;	$\frac{1}{20}$	737 in-oz	$\frac{3}{8}$ " (10.0 mm)	115, 60	
		KH-04405-12		200 to 2000				230, 50	
D	KH-04400-16	Constant speed with output, gear-driven, LED	40 to 2000	$\frac{1}{15}$	36 in-oz	$\frac{3}{8}$ " (10.0 mm)	115, 60		
	KH-04400-20		230, 50						
	KH-04400-22	Constant speed, dual-range with output, gear-driven, LED	12 to 400;	$\frac{1}{8}$	355 in-oz	$\frac{3}{8}$ " (10.0 mm)	115, 60		
	KH-04400-24		60 to 2000				230, 50		

\* Shaft not included.

#### Accessories

**KH-04553-55 Shaft**,  $\frac{5}{16}$ " dia x 18"L; 316 stainless steel (SS)

**KH-04538-10 Shaft**,  $\frac{3}{8}$ " dia x 30"L; 316 SS. Accepts all  $\frac{5}{16}$ " bore dia propellers

**KH-04553-62 Propeller**, three blade,  $\frac{1}{2}$ " dia x  $\frac{5}{16}$ " bore dia; 316 SS

**KH-04553-68 Propeller**, three blade, 3" dia x  $\frac{5}{16}$ " bore dia; 316 SS

**KH-04546-00 Mixer stand**, 27"H x  $\frac{5}{8}$ " dia

**KH-04560-24 Heavy-duty dual clamp**

#### Replacement Chucks

Catalog number	Fits models	Price
KH-04402-00	A, B <sup>†</sup>	
KH-04401-01	B, C, D	

<sup>†</sup>Use for models 04400-04, 04400-08

## Laboratory Mixers



**New**

**Mixer 50705-00**  
with digital display



**Mixer 50703-10**  
with digital display,  
RS-232 interface,  
and software



### Digital Dual-Range Mixer

#### Two speed ranges to suit a variety of mixing applications

- Maintenance-free motor is rated for continuous duty

Use this versatile, affordable mixer for liquid volumes up to five gallons and viscosities up to 10,000 cps (approximately the viscosity of honey). Select speed from 60 to 2000 rpm in two ranges for a variety of applications. Through-shaft design permits adjustment of shaft length and impeller depth—allows you to place or remove mixing vessels without repositioning the mixer.

The motor and drive unit are conveniently integrated into a compact aluminum and thermoplastic housing with easy-to-use controls. The quiet, fan-cooled motors feature thermal overload shut-off, and an efficient heat-dissipating design to ensure a long service life. Motors are maintenance-free and are rated for continuous duty. All mixers feature stepless speed control. The 1/2" LCD shows rotational speed in rpm and enables you to precisely control and repeat process parameters.

**What's included:** chuck (accepts up to 3/8" [10-mm] dia shafts), 6 1/4"L x 1/2" dia mounting rod, and a 6 1/2-ft, three-wire power cord (115 VAC model includes plug).

### Specifications & Ordering Information



**Motor power input:** 70 watts

**Dimensions:** 3 1/2"W x 11 1/2"H x 7 3/4"D

Catalog number	Speed range (rpm)	hp	Max torque (in-oz)	Power (VAC)	Price
<a href="#">KH-50705-00</a>	60 to 500/240 to 2000	1/10	259	115	
<a href="#">KH-50705-10</a>				230	

### Accessories for all mixers on this page

**KH-04537-10 Shaft**, 3/8" dia x 24"L; 316 SS. Accepts 5/16" bore dia propellers

**KH-04553-68 Propeller**, 3" overall dia x 5/16" bore dia; 316 SS

**KH-08041-22 Jumbo holder clamp** for mounting the mixer head onto a stand, holds rods up to 7/8" dia



**Propeller**  
04553-68

### High-Viscosity Mixers

#### Powerful motor handles viscosities up to 50,000 cps

- Constant speed is maintained by electronic controller
- Models available with RS-232 interface capability

These powerful mixers handle liquid volumes up to ten gallons and viscosities up to 50,000 cps (approximately the viscosity of synthetic polymers). Electronic speed control limits speed variation to  $\pm 2\%$ —even under changing load conditions. The through-shaft design lets you easily adjust the shaft length and impeller depth—place or remove mixing vessels without repositioning the mixer.

Aluminum and thermoplastic housing is designed to make efficient use of space. The quiet, maintenance-free motors are rated for continuous duty. Overload protection shuts down motor if maximum torque is exceeded. Electronic safety circuit produces a safe, smooth start to prevent spraying.

Models 50703-00 and -05 feature an analog output to record speed and torque. Models 50703-10 and -15 feature an analog output, plus a digital display, an RS-232 interface, and labworldsoft® software. The 1/2" LCD presents speed and torque data and enables you to precisely control and repeat process parameters.

Use the RS-232 interface to view and control mixing parameters through your computer. The labworldsoft® program lets you simultaneously connect eight laboratory instruments to your computer allowing you to document, monitor, and regulate data for torque, rotational speed, weight, temperature, pH, conductivity, and flow rates. Ideal for automating small processes from single devices.

**What's included:** chuck (accepts up to 3/8" [10-mm] dia shafts), 8 5/8"L x 5/8" dia mounting rod, and a 4 1/2-ft, three-wire power cord (115 VAC models include plug).

### Specifications & Ordering Information



**Motor power input:** 130 watts **Dimensions:** 3 1/4"W x 8"H x 7 1/2"D

**Software system requirements** (models 50703-10, -15 only):

486 computer or better, at least 33 MHz, 8 MB RAM, mouse, one additional serial interface (COM 1 or 2), Windows® 3.1 or later

Catalog number	Speed range (rpm)	hp	Max torque (in-oz)	Power (VAC)	Price
<b>High-viscosity mixer</b>					
<a href="#">KH-50703-00</a>	50 to 2000	1/6	85	115	
<a href="#">KH-50703-05</a>				230	
<b>High-viscosity mixer with digital display, RS-232 interface, and software</b>					
<a href="#">KH-50703-10</a>	50 to 2000	1/6	85	115	
<a href="#">KH-50703-15</a>				230	

# Mi Mixers

## Laboratory

### General Purpose LabMaster™ Mixers

Each mixer includes an A-310 impeller for high-efficiency mixing

- Choose from three mounting styles

LabMaster direct-drive mixers are excellent for pilot studies of chemical, food, and wastewater treatment processes. All mixers feature a fuse-protected TENV continuous-duty motor; operate on 115 VAC, 50/60 Hz; and have an on/off indicator light.

We offer mixers with three types of mounting styles. The tube suspension mixers require the heavy-duty dual clamp 04560-24 (sold below right). The universal clamp mixers mount directly to a ring stand or tank rim. Order mixers with Tri-Clamp® mounting flange to use with tanks with a sanitary quick-connect mixer port.

#### A General-Purpose Mixers

These mixers operate at a fixed speed of 1800 rpm. An adjustment knob lets you quickly position the mixer head.

**General-purpose mixers include:** 5/16" dia x 18"L, 316 SS, non-through shaft, 2 1/2" dia x 5/16" bore, 316 SS, A-310 impeller, collet and 6-ft cord and plug.

#### B-C Remote Control Mixers

These variable-speed mixers feature a remote speed controller connected to the mixer via 5-ft cable that lets you position the controller safely away from splashing liquids. Choose either an analog controller ("B") or digital controller ("C") with 4-digit LED display. Through shaft and motor angle adjustment knob give you precise control of stirring angle and propeller depth.

**Remote control mixers include:** 3/8" dia x 24"L, 316 SS, through shaft (one end accepts 5/16" bore impellers), 5/16" bore, 316 SS, A-310 impeller (see ordering information table for size), collet, and 6-ft cord and plug.

#### D Closed System Mixers

A 4" Tri-Clamp® mounting flange makes these variable-speed mixers ideal for sanitary applications and other applications requiring no vapor loss. A mechanical dry running seal requires no lubrication and withstands pressures up to 25 psi. Analog speed controller is connected to the mixer via a 5-ft cable.

**Closed system mixers include:** 3/8" dia x 30"L, 316 SS, through shaft (one end accepts 5/16" bore impellers), 5/16" bore, 316 SS, A-310 impeller (see ordering information table for size), collet, and 6-ft cord and plug.



For information on mixers with Viton® V-ring seal or ANSI flange, or to order a tank with 4" sanitary quick-connect fittings, call our Application Specialists.

847-549-7600

### Specifications & Ordering Information

ISO 9001:2000  
CERTIFIED SUPPLIER

Catalog number	Description	Speed (rpm)	hp	Torque (in-oz)	Shaft length	Power (VAC, Hz)	Price
<b>A General-purpose mixers</b>							
KH-04560-00	Tube suspension*	1800	1/30	19	2.5"	115 50/60	
KH-04561-00	Universal clamp						
<b>B Remote control mixers with analog speed controller</b>							
KH-04561-40	Tube suspension*	90 to 1600	1/15	42	3.4"	115 50/60	
KH-04561-20		180 to 2300					
KH-04561-50	Universal clamp	90 to 1600	1/15	42	3.4"	115 50/60	
KH-04561-30		180 to 2300					
<b>C Remote control mixers with digital speed controller</b>							
KH-04571-40	Tube suspension*	90 to 1600	1/15	42	3.4"	115 50/60	
KH-04571-20		180 to 2300					
KH-04571-50	Universal clamp	90 to 1600	1/15	42	3.4"	115 50/60	
KH-04571-30		180 to 2300					
<b>D Closed system mixers</b>							
KH-04560-91	Tri-Clamp® flange	90 to 1600	1/15	42	3.4"	115 50/60	
KH-04560-96		180 to 2300					

\*Requires heavy-duty dual clamp 04560-24 sold under "Accessories" at right.



Remote control mixer 04561-50 with universal clamp mounting and analog speed controller

Stand 04546-00 not included; order separately below.

Digital controller



General-purpose mixer 04560-00 with tube suspension mounting



Closed system mixer 04560-91 with Tri-Clamp® mounting flange

All mixers on this page include an A-310 impeller.



### Accessories

**KH-04560-24 Heavy-duty stainless steel dual clamp.** Required for tube suspension mount mixers

**KH-04546-00 Mixer stand** has a black cast-iron base and a stainless steel rod. Rod measures 27"H x 5/8" dia

**KH-50001-90 Controller support platform.** Mount remote controller adjacent to mixer head. Includes dual-rod clamp

## Sanitary Mixers

Specifically designed for pharmaceutical, biotech, food and other applications where cGMP requirements are standard

- Compact, rugged, sanitary design with 180-Grit surface finish for wetted surfaces
- Two dual-sealed radial precision roller bearings for superior shaft support
- Dry running mechanical seal capable of speeds up to 1200 rpm and pressures from full vacuum to 200 psig

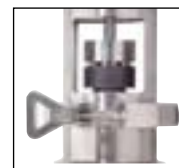
**What's included:** all mixers include a 30"L, 316 stainless steel shaft with removable marine-style propeller. Air-driven mixers include muffler and regulating valve.



04403-06



Optional propellers available on special order—welded, ground, and polished to a sanitary finish.



Mechanical seal



04403-02

### Specifications & Ordering Information

Catalog number	Speed (rpm)	hp	Max torque (in-oz)	Drive type	Mount	Drive dimensions (H x D)	Shaft (L x dia)	Impeller dia	Power	Price
<b>Stainless steel body mixers</b>										
<a href="#">KH-04403-02</a>	0 to 1200	1/3	64	Pneumatic, direct drive	3" Tri-Clamp®	11 1/2" x 3 1/2"	30" x 3/8"	3"	Air	
<a href="#">KH-04403-04</a>	0 to 1200	1/2	288	Pneumatic, gear reduced (7/1)		14" x 3 1/2"				
<a href="#">KH-04403-06</a>	0 to 500	1/4	352	Electric, gear reduced (5/1)		19 1/2" x 4 1/2"				
<b>Aluminum body mixers</b>										
<a href="#">KH-04403-08</a>	0 to 1200	1/3	64	Pneumatic, direct drive	45/50 Teflon® standard taper	12" x 3 1/2"	30" x 3/8"	3"	Air	
<a href="#">KH-04403-10</a>	0 to 1200	1/2	288	Pneumatic, gear reduced (7/1)		14" x 3 1/2"				
<a href="#">KH-04403-12</a>	0 to 500	1/4	352	Electric, gear reduced (5/1)		18 1/2" x 4 1/2"				

## Low-Cost Hazardous-Duty Air-Drive Mixers

Adjustable speed to 10,000 rpm and torque as high as 1600 in-oz

Safely use these air-drive mixers whenever electrical power is hazardous or impractical. Ideal for mixing solvents, lacquers, and volatile chemicals without the possibility of spark ignition.

Mixers accept an air input line pressure to 80 or 100 psi (10 to 12 cfm). A needle valve enables you to control mixing speed throughout the range for each mixer, and a built-in muffler ensures quiet operation. Select direct-drive mixers for your high-speed, low-torque applications or gear-drive mixers for your high-torque, low-speed applications. Model 04681-10 has steel gears for continuous agitation of highly viscous materials.

We recommend installing an air filter/regulator 07042-75 and an air lubricator 07042-70 in your air supply line—order from "Accessories" on the bottom of page 992. See more accessories on pages 996-999.

**What's included** (all except model 04686-15): 316 SS paddle assembly (3/8" dia x 12"L shaft with 2 1/2" dia propeller), collet, 10"L x 3/16" dia mounting rod, muffler, needle valve, and 4-ft L air hose with fittings.

**Mixer 04686-15 includes:** 3/8" dia x 18"L, 316 SS shaft, 3 5/8" dia, 316 SS propeller, collet, 10"L x 3/8" dia mounting rod, muffler, needle valve, and 4-ft L air hose with fittings.

### Specifications & Ordering Information

Catalog number	Speed (rpm)	hp	Torque	Air inlet pressure	Price
<b>Direct-drive air motor mixers, 35 to 100 psi air input pressure</b>					
<a href="#">KH-04680-00</a>	200 to 10,000	1/3	64 in-oz*	35 to 100 psi	
<a href="#">KH-04686-00</a>	200 to 7000	1/2	96 in-oz*		
<a href="#">KH-04686-15</a>	300 to 3000	3/4	448 in-oz†		
<b>Gear-drive air motor mixers, 35 to 80 psi air input pressure</b>					
<a href="#">KH-04685-00</a>	50 to 1200	1/3	288 in-oz*	35 to 80 psi	
<a href="#">KH-04681-10</a>	50 to 1200	1/3	288 in-oz*		
<a href="#">KH-04686-10</a>	50 to 1000	1/2	416 in-oz*		
<a href="#">KH-04681-00</a>	8 to 170	1/3	1600 in-oz*		

\*Torque values are given at air motor speed of 6000 rpm and pressure of 80 psi.

†Torque values are given at air motor speed of 3000 rpm and pressure of 100 psi.



04680-00

04686-00

04686-15

# Mi Mixers

## Laboratory

### LabMaster™ Mixers

Repeatable data entry via the splash-proof digital keypad greatly enhances process consistency and ensures accurate scale-up

- Three included impellers provide maximum efficiency in variety of applications—A-310 low-shear impeller is ideal for flocculation studies or flash mixing
- Computer-compatible models available for thorough control and monitoring through your computer

#### Standard Mixers

Offering excellent flow and fluid shear characteristics for low-to medium-viscosity liquids, the through shaft design lets you adjust the extension of the mixer shaft without moving the mixer drive—accommodates shafts up to 3/8"-diameter.

**Standard mixers include:** 316 SS shaft (3/8" dia x 24" L), three 316 SS Impellers (3.4" dia x 5/16" bore A-310, 2.7" dia x 5/16" bore A-100, and 2.0" dia x 5/16" bore R-100), Jacobs® chuck and key, universal mounting clamp, and 6-ft cord with grounded plug (115 VAC); for 230 VAC operation, specify country of destination for correct line cord.

#### High-Torque Mixers

Recommended for thicker polymer-, sludge- or large-batch mixing that require high pumping capacities. The non-through-shaft design accepts shafts up to 1/2" diameter.

**High-torque mixers include:** 316 SS shaft (3/8" dia x 24" L), three 316 SS Impellers (2.0" dia x 5/16" bore R-100, 3.1" dia x 5/16" bore A-100, and 5.0" dia x 3/8" bore A-320), Jacobs® chuck and key, universal mounting clamp, and 6-ft cord with grounded plug (115 VAC); for 230 VAC operation, specify country of destination for correct line cord.

#### Computer Compatible Mixers

Each type of mixer, standard or high-torque, is available in a computer compatible model. Use this model to completely control up to five separate mixers through your computer simultaneously. They offer the same great features listed above plus an RS-232 interface kit, Mixer-Connect™ software, temperature probe, and a 10-ft RJ11 to RJ22 communication cable.

Mixer-Connect software lets you easily measure, calculate, display, or record eight true repeatable fluid mixing scale-up parameters—power, torque, flow, temperature, speed, timer, direction of rotation, and impeller style. Use the software to control and obtain data from five mixers simultaneously! It also enables you to collect, monitor, plot, and record data for up to 32 LabMaster mixers without bulky interface devices. Validation data can be easily exported. Monitor input on the display or format input to ASCII files for storage in your computer.



View current running speed and power, torque, flow, time, or temperature readings in the RUN mode.



Universal mounting clamp (included)



Use computer-compatible mixers for precise data collection 50325-20.



A-310  
04540-25



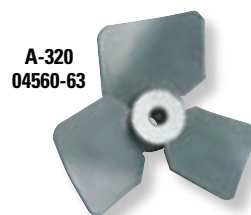
R-100  
04560-30



A-100  
04540-20

**GO to page(s) 996-999**

Our full line of laboratory mixer accessories can be found on pages 996-999.



A-320  
04560-63

#### Specifications & Ordering Information

**Watts:** 90

**Dimensions:** 6"W x 11 1/2"H x 5"D

**Software system requirements** (computer-compatible models only): 486 computer or better, DOS 5.0 or later, Windows® 3.11 or better (except NT or 2000), 4 MB RAM, 2 MB hard disk space.

Description	Drive	Speed (rpm)	hp	Max torque	Max vol* gal. (L)	115 VAC, 60 Hz		230 VAC, 50 Hz	
						Cat. no.	Price	Cat. no.	Price
<b>LabMaster™ mixers</b>									
Standard	Direct	50 to 1800	1/8	71 in-oz	26 (100)	<a href="#">KH-50325-10</a>		<a href="#">KH-50325-15</a>	
High-torque	Gear (3.66:1)	15 to 500	1/8	233 in-oz	106 (400)	<a href="#">KH-50325-30</a>		<a href="#">KH-50325-35</a>	
<b>Computer-compatible LabMaster™ mixers with RS-232 interface kit, software, and temperature probe</b>									
Standard	Direct	50 to 1800	1/8	71 in-oz	26 (100)	<a href="#">KH-50325-20</a>		<a href="#">KH-50325-25</a>	
High-torque	Gear (3.66:1)	15 to 500	1/8	233 in-oz	106 (400)	<a href="#">KH-50325-40</a>		<a href="#">KH-50325-45</a>	

\*For water-like solution.

**KH-04562-60 Replacement temperature probe** for use with computer-compatible models only. Measures 8 1/2"L x 1/4" dia; 3-ft cable



## Hazardous-Duty Air-Drive Mixers

### Use where electrical power is hazardous or impractical

Use variable-speed air-drive mixers in the presence of volatile or explosive vapors. All air-drive mixers accept an air input line pressure from 30 to 90 psi (8 cfm maximum) to generate mixing speeds from 30 to 1800 rpm. All mixers include a needle valve for controlling mixing speed and a muffler to ensure quiet operation. We recommend using an in-line filter/regulator and an air lubricator—order from bottom of page 992.

### General-Purpose Air-Drive Mixer

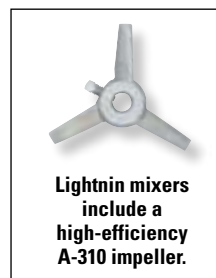
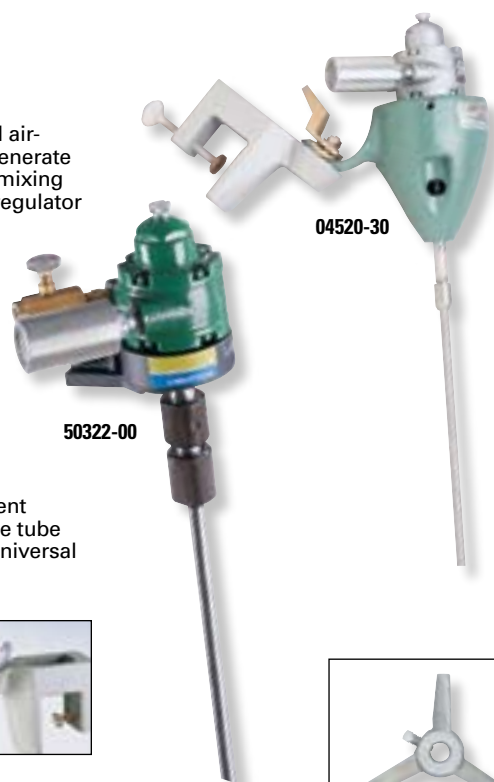
This general-purpose air-drive mixer handles up to 100 liters of low-viscosity fluids or smaller volumes of higher viscosity fluids. Internal flex coupling protects motor from accidental shock loads on the shaft and impeller.

**What's included:** 5/16" dia x 12"L, 316 SS shaft, 5/16" bore x 2 1/2" dia, 316 SS A-310 impeller, 316 SS collet-type chuck, universal clamp, muffler, and needle valve.

### LabMaster™ Air-Drive Mixers

These mixers are excellent for pilot studies of chemical, food, and wastewater treatment processes. We offer LabMaster air-drive mixers with two types of mounting styles. The tube suspension mixers require the heavy-duty clamp 04560-24 (order on page 992). The universal clamp mixers mount directly to a ring stand or tank rim.

**What's included:** 3/8" dia x 18"L, 316 SS nonthrough-type shaft, 5/16" bore x 2 1/2" dia, 316 SS A-310 impeller, collet-type chuck, universal clamp or tube suspension mounting, muffler, and needle valve.



### Specifications & Ordering Information

Catalog number	Description	Speed (rpm)	hp	Maximum torque	Power	Price
<a href="#">KH-04520-30</a>	General purpose universal clamp	30 to 1800	1/30	19 in-oz	Air	
<a href="#">KH-50322-00</a>	LabMaster tube suspension	30 to 1800	1/15	37 in-oz	Air	
<a href="#">KH-50322-10</a>	LabMaster universal clamp					



Call our Application Specialists: customize mixers to fit your needs. Call to order special features such as PTFE-covered shafts and PTFE propellers, shaft lengths, mounting connections, Hastelloy wetted surfaces, and more.

**847-549-7600**

## In-Line Homogenizer System

### Ideal for air-free, sterile, and in-line suspension; emulsifying; and deagglomeration

- Use in vacuum applications or under pressure up to 6 bar
- Flow chamber prevents air from being drawn into the line during batch operation
- Compact, modular design requires little space-mount on benchtop with stand

Homogenizer features a variable speed motor with precision speed control. The rotor-stator generators are constructed of Kalrez® and stainless steel; use in applications up to 220°C (428°F). Use the included generator for applications requiring coarse dispersion (10 to 30 µm), or order generator 04719-55 separately for fine dispersion.

**What's included:** 04719-00 (115 VAC) or 04719-05 (230 VAC) homogenizer, 10-ft power cord with standard plug (230 VAC model has European plug), rotor-stator generator (for coarse dispersion), flow chamber, and mounting stand.

### Specifications & Ordering Information

**Capacity:** 4.4 to 11.6 L/min      **Watts:** 350 output, 600 input  
**Speed range:** 8000 to 24,000 rpm      **Dimensions:** 17"W x 4"D x 5 1/2"H

Catalog number	Power	Price
<a href="#">EK-04719-20</a>	115 VAC, 50/60 Hz	
<a href="#">EK-04719-25</a>	230 VAC, 50/60 Hz	

**EK-04719-55 Rotor-Stator generator** for fine dispersion (5 to 25 mm).  
 Measures 1143 mm x 25 mm



# Mixers

## Industrial

### Batch Mixers

**Large selection—on pages 990 to 992—lets you match mixer capability to your specific application**

- Mix materials with viscosities up to 10,000 cps

Use these batch mixers in a wide range of applications. Choose a direct-drive model for small batch mixing or high-shear applications. Select a gear-drive model for mixing larger batches or more viscous liquids. Mixing shafts may be cut to suit tank depth. Use the sizing guide at right to select the appropriate mixer for your application.

Variable-speed, electric mixers feature surge-protected TENV motors with 150% momentary overload capacity, push-button reset, and single-turn potentiometer mounted on top of motor for convenient speed setting. An adjustable trimmer and I/R compensation permit refinement of speed settings to within  $\pm 5\%$ . Air-powered mixers feature needle valve for precise speed control and built-in muffler for quiet operation. We recommend using an air filter/regulator and an air lubricator with all air-powered mixers—order from “Accessories” on page 992.

Air-powered mixers operate with air input into the  $\frac{3}{8}$ " NPT(F) inlet port on the needle valve. All air motors require 60 to 75 max psig of air pressure. One-quarter and  $\frac{1}{3}$ -hp air motors require an air flow rate of 15 scfm. One-half and  $\frac{3}{4}$ -hp air motors require an air flow rate of 30 scfm.

The TENV electric mixers operate on 115 VAC, one-phase power and include a 7-ft cord with three-prong plug (model 04518-20 has no cord). All TEFC and XPRF motors operate on 208-230/460 VAC, three-phase power and require power wiring to the motor.



All Lightnin batch mixers include a 316 stainless steel A-310 impeller (model 50350-40).

**A**  
50323-20



#### **A** High-Torque, Direct-Drive Mixers

High-torque mixers are available with either 20° offset tank clamps or 2" NPT(M) bung adapters (models 50323-12 and -22). The offset clamp positions mixer for angular, off-center mounting on unbaffled tank rims. Bung-entering models mount onto 2" NPT(F) bungs for closed-container mixing.

**What's included:** 316 stainless steel (SS) shaft, 316 SS A-310 impeller, and a drive quill with set screw.

#### Specifications & Ordering Information

Catalog number	Speed (rpm)	hp	Torque (at max rpm)	Motor type	Drive dimensions (H x dia)	Mount	Shaft (L x dia)	Impeller (overall dia)	Power (VAC)	Price
<b>High-torque, direct-drive mixers</b>										
<a href="#">KH-50323-10</a>	20 to 1800	1/4	140 in-oz	Air	11 1/2" x 6 1/2"	20° offset clamp	48" x 5/8"	3.8"	—	
<a href="#">KH-50323-12</a>						2" bung with lipseal	32" x 5/8"	3" folding		
<a href="#">KH-50323-20</a>	90 to 1800	1/4	140 in-oz	TENV	11 1/2" x 6 1/2"	20° offset clamp	48" x 5/8"	3.8"	115	
<a href="#">KH-50323-22</a>						2" bung with lipseal	32" x 5/8"	3" folding		
<a href="#">KH-50310-34</a>	1750	1/4	140 in-oz	XPRF	16 1/2" x 6 1/2"	20° offset clamp	48" x 5/8"	3.8"	208 to 230/460	
<a href="#">KH-50310-36</a>										

#### Sizing Guide

Use the sizing guide below to select the appropriate mixer for your application. Choose the viscosity closest to materials to be mixed. Then find the volume you will be mixing. Color corresponds to mixer catalog number. Sizing guide is for general-purpose mixing applications and has the following limits:

- Newtonian, thixotropic or pseudoplastic fluids ONLY
- Solids limited to 25% by weight of total batch weight
- Specific gravity of total batch limited to 1.25 (10 1/2 lb/gallon)

Viscosity			Volume in gallons							
ssu	cps	Example	10	25	50	100	200	500	1000*	1500*
31	1	Water	10	25	50	100	200	500	1000*	1500*
1240	250	SAE 40 Oil	10	25	50	100	200	500	1000*	1500*
2480	500	Most paints	10	25	50	100	200	500	1000*	1500*
4600	1000	Castor oil	10	25	50	100	200	500	1000*	1500*
11,600	2500	Molasses	10	25	50	100	200	500		
23,500	5000	Honey	10	25	50	100	200			
46,500	10,000	Sour cream	10	25	50	100				

\*Min tank dia for 1000 gal. selections = 66" OR max depth from mounting surface = 68"

†Min tank dia for 1500 gal. selections = 78" OR max depth from mounting surface = 68"

#### Axial Flow Impeller (Lightnin® A-100)

These Lightnin® 316 stainless steel impellers have Superpitch® design with a 1.5 pitch ratio for greater batch mixing capabilities.



Catalog number	Overall dia	Bore dia	Price
<a href="#">KH-50350-00</a>	2.7"	5/8"	
<a href="#">KH-04317-90</a>	3.6"	5/8"	
<a href="#">KH-50350-04</a>	4.5"	5/8"	
<a href="#">KH-50350-06</a>	5.2"	5/8"	
<a href="#">KH-50350-08</a>	6.0"	5/8"	
<a href="#">KH-50350-10</a>	7.7"	5/8"	

See page 992 for our full selection of impellers and other mixer accessories.

**GO to page(s) 1658-1661**

To order plastic tanks that are compatible with these Lightnin batch mixers.



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## Batch Mixers (continued)

### B Small Batch, Direct-Drive Mixers

Use these versatile mixers for lab mixing or for scaling up pilot plant experiments. All models include fully adjustable tank-clamp to position mixer at any angle. Choose a mixer with one of the following motor types:

#### Fixed-Speed, Explosion-Proof Motor

(model 04518-20) is UL-listed for Class I, Group C and D conditions. Cord and plug are not included.

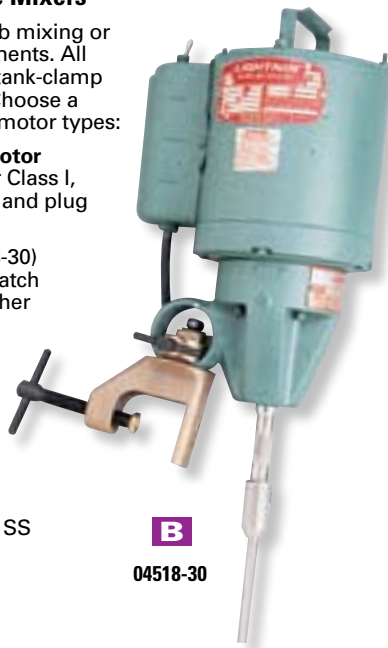
#### Two-Speed Motor (model 04518-30)

lets you match mixer speed to batch volume and viscosity—select either 1200 or 1600 rpm speed.

#### Fixed-Speed, 1/8-hp Motor

(model 04518-40) can mix up to 100 gallons of water-like fluids. Corrosion-resistant enamel housing allows use in high-humidity atmospheres.

**What's included:** 316 SS shaft, 316 SS A-310 impeller, and 316 SS collet-type chuck.



**B**  
04518-30

### C Heavy-Duty, Gear-Drive Mixers

These variable-speed, gear-drive mixers are ideal for mixing your high-viscosity materials or large batches of water-like fluids. All generate enough torque to mix highly viscous fluids.

Gear-drive mixers mount with 20° offset tank clamp (included). Choose either an air-powered or electric mixer.

Select from three speed options; 20 to 350 rpm (20:1 ratio), 20 to 280 rpm (14:1 ratio), or fixed speed of 350 or 280 rpm.

The 3/4-hp mixers generate plenty of torque for your high-viscosity applications.

**What's included:** 316 SS shaft, 316 SS A-310 impeller, and drive quill with set screw.



**C**  
50323-30

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## Specifications & Ordering Information

Catalog number	Speed (rpm)	hp	Torque (at max rpm)	Motor type	Drive dimensions (H x dia)	Mount	Shaft (L x dia)	Impeller (overall dia)	Power (VAC)	Price	
<b>B Small batch, direct-drive mixers</b>											
KH-04518-20	1750	1/20	29 in-oz	XPRF	13 7/8" x 6"	Clamp	24" x 3/8"	3.4"	115		
KH-04518-30	1200/1600	1/15	42 in-oz	TENV	12 5/8" x 10 1/16"			3.4"	115		
KH-04518-40	1750	1/8	72 in-oz	TENV	12 5/8" x 10 1/16"			3.4"	115		
<b>C Heavy-duty, gear-drive mixers</b>											
KH-50323-30	20 to 350	1/4	720 in-oz	TENV	20 1/2" x 6 5/8"	20° offset clamp	60" x 3/4"	10"	115		
KH-50323-40		1/2	1440 in-oz	Air	14 1/4" x 6 5/8"			11.8"	—		
KH-50323-42	20 to 350	1/4	720 in-oz	TENV	20 1/2" x 6 5/8"	20° offset clamp	36" x 3/4"	11.8"	115		
KH-50310-00				Air	15 1/2" x 6 5/8"			7.6"	115		
KH-50310-02	20 to 350	1/2	1440 in-oz	TENV	21 1/2" x 6 5/8"	20° offset clamp	36" x 3/4"	8.8" (dual)	115		
KH-50310-04				Air	14 1/4" x 6 5/8"			8.8" (dual)	—		
KH-50310-06	20 to 350	1/4	720 in-oz	TENV	20 1/2" x 6 5/8"	20° offset clamp	48" x 3/4"	10"	115		
KH-50310-08				Air	14 1/4" x 6 5/8"			10"	—		
KH-50310-10	20 to 350	1/2	1801 in-oz	TENV	21 1/2" x 6 5/8"	20° offset clamp	48" x 3/4"	11.2" (dual)	115		
KH-50310-12				Air	14 1/4" x 6 5/8"			11.2" (dual)	—		
KH-50310-14	20 to 350	1/4	720 in-oz	TENV	21 1/2" x 6 5/8"	20° offset clamp	60" x 3/4"	12.8" (dual)	115		
KH-50310-16				Air	14 1/4" x 6 5/8"			12.8" (dual)	—		
KH-50310-18	20 to 350	1/2	1801 in-oz	TENV	21 1/2" x 6 5/8"	20° offset clamp	60" x 3/4"	11.2"	115		
KH-50310-20				Air	14 1/4" x 6 5/8"			11.2"	—		
KH-50310-22	20 to 350	1/4	720 in-oz	TENV	20 1/2" x 6 5/8"	20° offset clamp	48" x 3/4"	11.2" (dual)	115		
KH-50310-24				Air	18 1/4" x 6 5/8"			11.2" (dual)	—		
KH-50310-26	20 to 350	3/4	2701 in-oz	TENV	23" x 6 5/8"	20° offset clamp	60" x 3/4"	12.8" (dual)	115		
KH-50310-28				Air	18 1/4" x 6 5/8"			12.8" (dual)	—		
KH-50310-30	20 to 350	1/4	720 in-oz	TENV	20 1/2" x 6 5/8"	20° offset clamp	48" x 3/4"	8.8" (dual)	208 to 230/460		
KH-50310-40				Air	14 1/4" x 6 5/8"			8.8" (dual)	208 to 230/460		
KH-50310-42	20 to 350	1/2	1440 in-oz	XPRF	20 1/2" x 6 5/8"	20° offset clamp	48" x 3/4"	10"	208 to 230/460		
KH-50310-46				TEFC				10"	208 to 230/460		
KH-50310-48	20 to 350	1/4	720 in-oz	XPRF	20 1/2" x 6 5/8"	20° offset clamp	60" x 3/4"	11.2"	208 to 230/460		
KH-50310-52				TEFC				11.2"	208 to 230/460		
KH-50310-54	20 to 350	3/4	2701 in-oz	XPRF	23" x 6 5/8"	20° offset clamp	48" x 3/4"	11.2" (dual)	208 to 230/460		
KH-50310-58				TEFC				11.2" (dual)	208 to 230/460		
KH-50310-60	20 to 350	1/4	720 in-oz	XPRF	22 1/2" x 6 5/8"	20° offset clamp	60" x 3/4"	12.8" (dual)	208 to 230/460		
KH-50310-64				TEFC				12.8" (dual)	208 to 230/460		
KH-50310-66	20 to 350	3/4	2701 in-oz	XPRF	23" x 6 5/8"	20° offset clamp	48" x 3/4"	12.8" (dual)	208 to 230/460		
KH-50310-68				TEFC				12.8" (dual)	208 to 230/460		

See next page for more batch mixers...

# Mi Mixers

## Industrial

### Batch Mixers (continued)

#### D-E Variable-Speed, Pressure Batch Mixers

These pressure batch mixers withstand up to 25 psi at ambient temperatures for closed-top tank applications. Once threaded or bolted to the drum or tank, the mixer prevents vapor loss, seals out dust and debris, protects motor from corrosive vapors, and eliminates contamination of batch solution from outside sources.

Dry running, single lip seal is made of fluorocarbon polymer. All wetted parts are 316 stainless steel (SS). Radial deflection wear at seal is reduced by additional ball bearings located just above flange. Mixer flange (blind drilled and tapped) measures 6" OD and bolts to a mating 2", 150-lb ANSI nozzle-type tank flange with 4 $\frac{3}{4}$ " dia bolt circles. Requires four,  $\frac{5}{8}$ " dia bolts and a 2" ID x 3 $\frac{3}{8}$ " OD gasket (not included). Bung adapter mounting allows mixer to be threaded into a 2" NPT bung.

**What's included:** 316 SS shaft, 316 SS A-310 impeller, and drive quill with set screw. Models 50310-68, -70 and -72 have bung adapter and include a folding impeller.



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#### Specifications & Ordering Information

Catalog number	Speed (rpm)	hp	Torque (at max rpm)	Motor type	Drive dimensions (H x dia)	Mount	Shaft (L x dia)	Impeller (overall dia)	Power (VAC)	Price
<b>D Direct-drive pressure batch mixers</b>										
KH-50323-50	20 to 1800	1/4	144 in-oz	Air	11 $\frac{1}{2}$ " x 65 $\frac{8}{8}$ "	2" flange with lip seal	48" x $\frac{5}{8}$ "	3.8"	—	—
KH-50323-52	90 to 1800			TENV	17" x 65 $\frac{8}{8}$ "				115	—
KH-50310-68	20 to 1800	1/2	192 in-oz	Air	15" x 65 $\frac{8}{8}$ "	2" bung with lip seal	32" x $\frac{5}{8}$ "	4" folding	—	—
KH-50310-70				TENV	25" x 65 $\frac{8}{8}$ "				115	—
KH-50310-72				XPRF	23" x 65 $\frac{8}{8}$ "				208 to 230/460	—
<b>E Gear-drive pressure batch mixers</b>										
KH-50323-54	20 to 350	1/4	720 in-oz	Air	14 $\frac{1}{2}$ " x 65 $\frac{8}{8}$ "	2" flange with lip seal	51" x $\frac{3}{4}$ "	10"	—	—
KH-50323-56				TENV	22 $\frac{1}{2}$ " x 65 $\frac{8}{8}$ "				115	—

## Accessories for Industrial Mixers (pages 990–992)

### Impellers

All impellers for industrial mixers are constructed of 316 stainless steel.

**A Axial Flow Impellers (A-100)** have Superpitch® design with a 1.5 pitch ratio for greater batch mixing capabilities.

**B Marine Impellers** are best suited for general-purpose applications.

**C High-Efficiency Axial Flow Impellers (A-310)** are designed to create 50% more mixing action and a true axial flow pattern.

**D Folding Impeller** fits perfectly into bung openings and narrow ports—folded diameter is 1 $\frac{5}{8}$ ". Impeller opens fully during mixing.

**E Folding Impeller** with integral shaft for bung-entering mixers. Shaft measures  $\frac{5}{8}$ " dia x 32"L; 1" dia (folded) impeller.



#### Specifications & Ordering Information

Key	Catalog number	Overall dia	Bore dia	Price
A	KH-50350-00	2.7"	$\frac{5}{8}$ "	
	KH-04317-90	3.6"	$\frac{5}{8}$ "	
	KH-50350-04	4.5"	$\frac{5}{8}$ "	
	KH-50350-06	5.2"	$\frac{5}{8}$ "	
	KH-50350-08	6.0"	$\frac{5}{8}$ "	
	KH-50350-10	7.7"	$\frac{5}{8}$ "	
	KH-50350-20	6.9"	$\frac{3}{4}$ "	
	KH-50350-22	7.7"	$\frac{3}{4}$ "	
B	KH-50350-24	8.9"	$\frac{3}{4}$ "	
	KH-50350-26	9.4"	$\frac{3}{4}$ "	
	KH-50350-28	10.0"	$\frac{3}{4}$ "	
	KH-50350-30	11.4"	$\frac{3}{4}$ "	
C	KH-50509-00	4.0"	$\frac{1}{2}$ "	
	KH-50509-10*	4.0"	$\frac{5}{8}$ "	
	KH-50350-40	3.8"	$\frac{5}{8}$ "	
	KH-50350-42	4.5"	$\frac{5}{8}$ "	
D	KH-50350-44	8.8"	$\frac{3}{4}$ "	
	KH-50350-46	10.0"	$\frac{3}{4}$ "	
	KH-50350-48	11.8"	$\frac{3}{4}$ "	
	KH-50350-82	7.6"	$\frac{3}{4}$ "	
E	KH-50350-84	11.2"	$\frac{3}{4}$ "	
	KH-50350-86	12.8"	$\frac{3}{4}$ "	
	KH-50350-88	6.3"	$\frac{3}{4}$ "	
D	KH-50509-20	3.75"	$\frac{5}{8}$ "	
E	KH-04317-80	3"	$\frac{5}{8}$ "	

\*304 stainless steel

### Shafts

**KH-04317-82 Shaft** for tank-clamp mounting mixers, 316 SS. Measures  $\frac{5}{8}$ " dia x 36"L

**KH-50350-52 Shaft;** 316 SS, from Lightnin;  $\frac{5}{8}$ " dia x 48"L

**KH-50350-55 Shaft;** 316 SS, from Lightnin;  $\frac{3}{4}$ " dia x 60"L

### Air Lubricators and Filter/Regulators

Control air flow from 1 to 20 scfm. Remove 95 to 98% of liquid contaminants. Use light spindle oil (80 to 160 SSU) with the lubricator. Maximum working pressure is 150 psi; gauge reads to 160 psi.

**KH-07042-70 Air lubricator,**  $\frac{1}{4}$ " NPT(F)

**KH-07042-75 Filter/regulator;** 5  $\mu$ m,  $\frac{1}{4}$ " NPT(F)

**KH-07042-80 Replacement filter** for 07042-75

**KH-06349-32 Reducing bushing;**  $\frac{3}{8}$ " NPT(M) x  $\frac{1}{4}$ " NPT(F), nylon. Pack of six

**KH-06349-71 Nipple;**  $\frac{1}{4}$ " NPT(M), nylon. Pack of six

## Heavy-Duty, Gear-Drive Mixers

### Powerful mixers for difficult applications

- Grease-filled gearbox eliminates oil seal and the possibility of oil contamination
- Mixers have no clutches to slip, wear, or replace
- Shaft bearings are permanently lubricated

Indexed ball-and-socket design with vibration pad lets you adjust the mixer position and achieve various process results you want. Cast aluminum housing. **Note:** power cord for 1/3- and 1/2-hp models is sold separately. Models of 3/4 to 1 hp require a separate motor starter, please call our Application Specialists for details.

**What's included:** 316 stainless steel shaft and impeller.

### Specifications and Ordering Information

Catalog number	Speed (rpm)	hp	Max torque (in-oz)	Drive type	Motor type	Mount	Drive* dimensions	Shaft (L x dia)	Impeller dia	Power (VAC, Hz)	Price
<a href="#">KH-50311-00</a> <a href="#">KH-50311-02</a>	35 to 350	1/2	1440	Gear	Air	Clamp	17 1/8"	36" x 3/4"	8" (dual)	—	
<a href="#">KH-50311-04</a> <a href="#">KH-50311-06</a>	35 to 350	1/2	1440	Gear	Air	Clamp	17 1/8"	48" x 3/4"	10" (dual)	—	
<a href="#">KH-50311-08</a> <a href="#">KH-50311-10</a>	35 to 350	1/2	1440	Gear	Air	Clamp	17 1/8"	60" x 3/4"	12" (dual)	—	
<a href="#">KH-50311-12</a> <a href="#">KH-50311-14</a> <a href="#">KH-50311-16</a>	35 to 350	3/4 3/4 1	2701 2701 3600	Gear	Air	Clamp	18" 18" 19 1/8"	48" x 3/4" 60" x 3/4" 60" x 1"	11" (dual) 11" (dual) 14"	—	
<a href="#">KH-50311-18</a> <a href="#">KH-50311-20</a> <a href="#">KH-50311-22</a>	350	1/3	1080	Gear	TEFC	Clamp	17 1/8"	36" x 3/4" 48" x 3/4" 60" x 3/4"	10"	115/230, 60	
<a href="#">KH-50311-24</a> <a href="#">KH-50311-26</a> <a href="#">KH-50311-28</a>	350	1/2	1440	Gear	TEFC	Clamp	18 1/2"	36" x 3/4" 48" x 3/4" 60" x 3/4"	8" (dual) 10" (dual) 10" (dual)	115/230, 60	
<a href="#">KH-50311-30</a> <a href="#">KH-50311-32</a> <a href="#">KH-50311-34</a>	350	3/4 3/4 1	2701 2701 3600	Gear	TEFC	Clamp	18 3/4"	48" x 3/4" 60" x 3/4" 60" x 1"	11" (dual) 11" (dual) 14"	115/230, 60	
<a href="#">KH-50311-36</a> <a href="#">KH-50311-38</a> <a href="#">KH-50311-40</a>	350	1/3	1080	Gear	XPRF	Clamp	20 1/2"	36" x 3/4" 48" x 3/4" 60" x 3/4"	10"	115/230, 60	
<a href="#">KH-50311-42</a> <a href="#">KH-50311-44</a> <a href="#">KH-50311-46</a>	350	1/2	1440	Gear	XPRF	Clamp	21"	36" x 3/4" 48" x 3/4" 60" x 3/4"	8" (dual) 10" (dual) 10" (dual)	115/230, 60	
<a href="#">KH-50311-48</a> <a href="#">KH-50311-50</a> <a href="#">KH-50311-52</a>	350	3/4 3/4 1	2701 2701 3600	Gear	XPRF	Clamp	21 1/2" 21 1/2" 20 1/2"	48" x 3/4" 60" x 3/4" 60" x 1"	11" (dual) 11" (dual) 14"	115/230, 60	

\*Clearance required above tank rim

### Accessories

[KH-50311-55](#) **Power cord** for use with 1/3- or 1/2-hp mixers; 6-ft cord with in-line switch and 3-prong grounded plug

[KH-50500-31](#) **Air set** for use with air-powered mixers up to 1/2 hp. Includes regulator, filter, and lubricator

[KH-50500-32](#) **Air set** for use with air powered mixers up to 1 hp. Includes regulator, filter, and lubricator

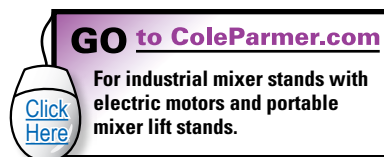
## Industrial Mixer Lift Stands

### Accommodate loads of up to 200 lbs

These heavy-duty mixer stands are constructed from heavy-gauge steel and square steel tubing. Use with any of our clamp mount mixers. Stands allow you to easily raise or lower your mixer into drums or tanks up to 48" in diameter. Each stand includes a 12" square base plate with four 3/16" mounting holes for permanent attachment to floors, dollies, etc.

Use the manual stand for lighter mixers. Move the mixer up or down in 1" increments; stand holds mixer in place with a clevis pin. The winch stand is ideal for heavier mixers.

Raise the mixer to any height; winch holds the mixer in place. Choose the air-powered stand for your heaviest mixers. Air motor holds mixer in place at any level.



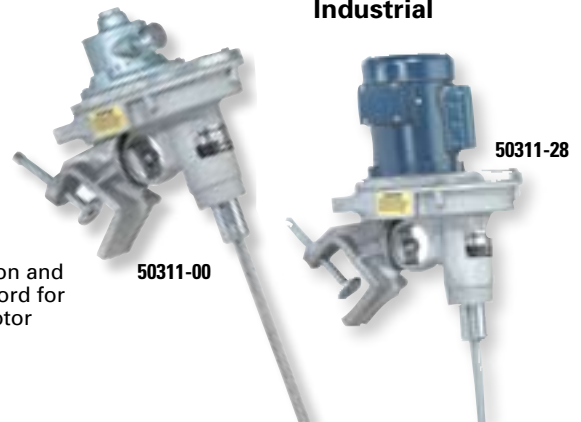
### Specifications & Ordering Information

Catalog number	Movement description	Minimum height	Maximum height	Price
<a href="#">KH-04600-10</a>	Manual	30"	84"	
<a href="#">KH-04600-20</a>	Winch	42"	82"	
<a href="#">KH-04600-30</a>	Air	42"	82"	

Manual mixer stand  
04600-10  
(mixer not included)

Winch mixer stand  
04600-20

Air mixer stand  
04600-30  
(mixer not included)



# Mi Mixers

## Drum Barrel



Heavy-duty mixer 04318-15 with C-clamp mount

Drum-lip mount

2" NPT(M) mount

Top-to-bottom movement provides effective mixing—without creating a vortex.



## Drum/Barrel Heavy-Duty Mixers

### Select from three mounting styles and either an air-drive or electric motor

These high-quality mixers are available in three mounting versions for heavy-duty mixing. Adjustable hand screws secure the drum-lip model to the rim of 55-gallon drums. The C-clamp model mounts externally and allows you to adjust the angle of the mixer. The 2" NPT(M) mount model screws directly into a standard 2" female bung to keep odors in and debris out.

Drum-lip and NPT(M) mount models include a folding impeller that attaches to the shaft with set screw and opens to a maximum diameter of 3¾" during operation. C-clamp models include a 4" fixed impeller. All mixers deliver maximum speed of 1725 rpm.

**Electric Motor Mixers** feature totally enclosed, fan-cooled motors operating on 115/230 VAC, 60 Hz. All electric motor mixers are UL-listed and CSA-approved.

**Air-Drive Motor Mixers** generate up to ½ hp at 80 psi (maximum pressure), ⅓ hp at 60 psi, and ⅓ hp at 40 psi. We recommend using an air filter/regulator and lubricator—order from "Accessories" below.

**What's included:** ⅝" dia, 316 SS shaft, 3¾" dia (max), 316 SS folding impeller (drum-lip and NPT(M) mount models) or 4" dia, 316 SS fixed impeller (C-clamp models), and 8-ft, three-wire cord with plug (for models 04318-10, -20 and 50500-00, -10 only).

### Specifications & Ordering Information



Catalog number	Description	hp	Max torque	Shaft length	Power (VAC, Hz)	Price
<b>Electric motor mixers</b>						
<a href="#">KH-04318-10</a>	Drum-lip	¼	144 in-oz	33⅞"	115/230 60	
<a href="#">KH-04318-15*</a>	C-clamp			32"		
<a href="#">KH-50500-00</a>	2" NPT(M)			29"		
<a href="#">KH-04318-20</a>	Drum lip	½	288 in-oz	33⅞"	115/230 60	
<a href="#">KH-04318-25*</a>	C-clamp			32"		
<a href="#">KH-50500-10</a>	2" NPT(M)			29"		
<b>Air-drive motor mixers</b>						
<a href="#">KH-04318-40</a>	Drum-lip	½	288 in-oz	33⅞"	½ hp at 80 psi (max pressure)	
<a href="#">KH-04318-50</a>	C-clamp			35"		
<a href="#">KH-50500-20</a>	2" NPT(M)			29"		

\*Models 04318-15 and -25 do not include a cord; see our "Electrical" section for cord/plug assemblies.

[KH-50509-20](#) Replacement folding propeller, ⅝" bore x 3¾" dia (max)

[KH-50509-10](#) Replacement fixed propeller, ⅝" bore x 4" dia

### Accessories for all air-drive mixers on this page

[KH-07042-70](#) Air lubricator, ¼" NPT(F) ports

[KH-07042-75](#) Air filter/regulator; 5 µm, ¼" NPT(F) ports

[KH-07042-80](#) Replacement filter for 07042-75 above

## Drum/Barrel Top-to-Bottom Tube Mixers

### Top-to-bottom movement provides thorough mixing without creating a vortex

These efficient tube mixers allow you to thoroughly mix the contents of 55-gallon drums without removing the drum lid. The 40" long mixing tube fits into standard 2" bungs and generates a powerful top-to-bottom flow.

A shaft-mounted turbine inside the mixing tube creates a steady suction effect at four upper intake ports. Mixers draw approximately 13 to 14 gallons of liquid (750 cp max) per minute through the 2" OD mixing tube. The forcefully expelled liquid resuspends and dissolves settled particles. Choose either an electric or air-drive motor mixer.

**Electric Motor Mixers** have ¼-hp motors that maintain a 3450-rpm mixing speed and operate on

115 VAC, 60 Hz. Mixers feature an on/off switch on the motor for your convenience. Select either a totally enclosed, fan-cooled (TEFC) motor or CSA-approved explosion-proof motor (rated for Class 1, Division 1, Group D conditions).

**Air-Drive Motor Mixer** has a ¾-hp motor that generates speeds from 300 to 3000 rpm with 50 to 100 psi air input. Mixer includes flow regulator and muffler. We recommend using an air filter/regulator and lubricator—order from "Accessories" above.

**What's included:** 40"L x 2" OD mixing tube with PTFE resin bearing at the top and base, 316 SS shaft, turbine, and sleeve, and 10-ft, 3-wire cord with plug (electric mixers only).

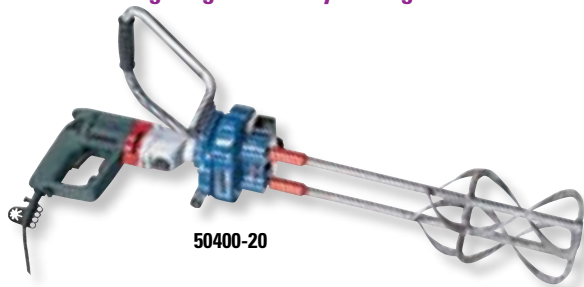


### Specifications & Ordering Information

Catalog number	Mixer type	Speed (rpm)	hp	Power (VAC, Hz)	Price
<a href="#">KH-04316-20</a>	TEFC motor	3450	¼	115, 60	
<a href="#">KH-04316-24</a>	Explosion-proof motor				
<a href="#">KH-04316-22</a>	Air-drive motor	300 to 3000	¾	Air	

## Double-Helix Mixer

Unique design integrates axial and radial rotation for thorough high-viscosity mixing



50400-20

This double-helix mixer operates in "planetary" fashion to completely mix viscous liquids, pastes, and dry-to-moist powders. Two separate paddles with intermeshing, spiral blades counter-rotate to mix, stir, and disperse high-viscosity materials. Orbital motion in the mixing vessel ensures thorough mixing.

Handheld operation and portability make this mixer ideal for on-site use. "Pistol-grip" style lets you mix common compounds in virtually any vessel, and lightweight gear box ensures effortless operation and transport. Optional rotating-vessel stand 50400-65 (below table) securely supports mixers for unattended operation.

**What's included:** 20½"L, 304 SS, dual detachable paddles, 5" overall dia x 8"L mixing section, industrial-finish carbon steel gearbox, and 8-ft cord with plug.

### Specifications & Ordering Information

Catalog number	Capacity (gal)	Speed (rpm)	Dimensions	hp	Power (VAC, Hz)	Price
<a href="#">KH-50400-20</a>	2 to 12	0 to 800	5"W x 35"H x 14"D	1	120, 60	

### [KH-50400-65](#) Rotating vessel stand

## Handlebar Pail and Drum Air Mixers

Mix up to 55 gallons of thin or heavy liquids

- Air control valve allows easy speed adjustment
- Low speed mixing and stalling will not overheat as with an electric motor
- Stainless steel shaft and impeller

Popular for mixing open and closed containers. Suitable for mixing slurries, mortar, petroleum products, and similar viscous materials. Propellers with folding blades fit through 2" bung.

**What's included:** 316 stainless steel shaft and impeller. Mixer 50500-41 includes trigger mounting on right handlebar for start/stop control. Order trigger separately for other models.

### Specifications & Ordering Information

Catalog number	Speed (rpm)	hp	Max torque (in-oz)	Drive type	Shaft (L x dia)	Propeller type	Price
<b>Hand-held single-grip mixers</b>							
<a href="#">KH-50500-45</a>	100 to 2000	¼	720	Air	15" x ¼"	2½" caged	
<a href="#">KH-50500-47</a>					21" x ½"	5" dia, caged	
<a href="#">KH-50500-49</a>					40" x ½"	5" dia, caged	
<b>Handlebar mixers</b>							
<a href="#">KH-50500-33</a>	100 to 2000	½	1440	Air	30" x ⅝"	4" dia, 3-blade	
<a href="#">KH-50500-35</a>					21" x ½"	5" dia, caged	
<a href="#">KH-50500-37</a>					40" x ½"	5" dia, caged	
<a href="#">KH-50500-39</a>					21" x ⅝"	3¼" dia, 2-blade folding	
<a href="#">KH-50500-41</a>					40" x ⅝"	3¼" dia, 2-blade folding	
<a href="#">KH-50500-43</a>					40" x ⅝"	8" dia, 6-blade folding	

[KH-50500-50](#) **Trigger** for use with handlebar mixers. Mounts on right handle to allow mixer to be started and stopped conveniently while maintaining grip with two hands

[KH-50500-31](#) **Air set** for use with air drive mixers. Complete set includes regulator, filter, and lubricator

## Pail Mixer with Rim Clamp

Convenient for mixing materials in a closed five-gallon bucket

- Adjust motor along the center line of the pail to align with the opening in lid
- Folding impeller allows you to mount the mixer without removing the lid
- Toggle switch on electric motor; air-control valve for speed adjustment on air-motor model

**What's included:** mixer comes complete with stainless steel 12" shaft and 3¾" diameter folding impeller.



50500-25

### Specifications & Ordering Information

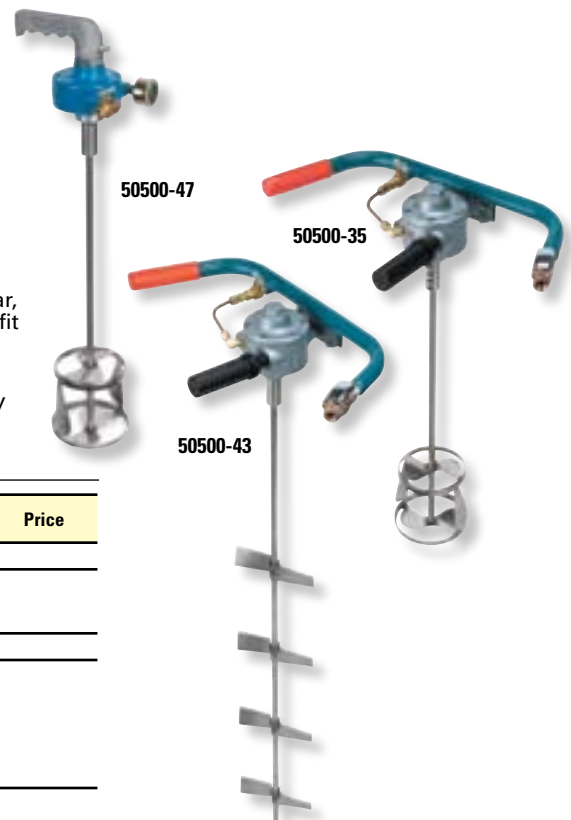
**Air input pressure:** 35 to 100 psi



Motor only

Catalog number	Speed (rpm)	hp	Motor type	Power (VAC, Hz)	Price
<a href="#">KH-50500-25</a>	1725	½	TEFC fixed speed	115, 60	
<a href="#">KH-50500-30</a>	0 to 2000	½ to 1	pneumatic	Air	

[KH-50500-31](#) **Air set** for use with air drive mixer. Complete set includes regulator, filter, and lubricator



50500-47

50500-35

50500-43

# Mi Mixers

Storage / Accessories

## Bulk Container Mixers

Save the time and trouble of draining fluids from their containers—excellent for short- or long-term storage

- Low-profile gear drive mixers fit between stacked semi-bulk shipping containers
- Folding propeller fits through 2" opening—expands to 9" operating diameter

Mounting brackets are sold separately for containers from Clawson, Clean Earth, Hoover, Polyprocessing, Schultz, Snyder, and Sonoco. Call our Application Specialists or e-mail us at [techinfo@coleparmer.com](mailto:techinfo@coleparmer.com) with brand, name/style, and bulk container size for more information.

**What's included:** 316 stainless steel shaft and propeller.



50316-08

### Specifications & Ordering Information



Catalog number	Speed (rpm)	hp	Torque in-oz (in-lb)	Motor type	Drive dimensions (L x W x H)	Shaft (L x dia)	Price
<b>Mixers with 2" NPT(M) thread mount; 115/230 VAC, 60 Hz (except air powered)</b>							
<a href="#">KH-50316-02*</a>	1750	1/2	384 (24)	TEFC	17" x 8" x 12"	29" x 3/4"	
<a href="#">KH-50316-06</a>	0 to 2000	1/2	320 to 384 (20-24)	Air	11" x 8" x 12"		
<a href="#">KH-50316-10</a>	1750	3/4	576 (36)	TEFC	19" x 8" x 12"		
<a href="#">KH-50316-14</a>	1750	1	768 (48)	TEFC	19" x 8" x 12"		
<b>Mixers requiring separate mounting hardware; 115/230 VAC, 60 Hz (except air powered)</b>							
<a href="#">KH-50316-00*</a>	1750	1/2	384 (24)	TEFC	17" x 8" x 7"	42" x 3/4"	
<a href="#">KH-50316-04</a>	0 to 2000	1/2	320 to 384 (20-24)	Air	11" x 8" x 7"		
<a href="#">KH-50316-08</a>	1750	3/4	576 (36)	TEFC	19" x 8" x 7"		
<a href="#">KH-50316-12</a>	1750	1	768 (48)	TEFC	19" x 8" x 7"		

\*Includes 8-ft power cord with 3-prong plug.

### Accessories

[KH-50500-31](#) Air set for use with air-powered mixers.

Includes regulator, filter, and lubricator

[KH-50316-52](#) Replacement shaft and propeller for 50316-02, -06, -10, -14

[KH-50316-50](#) Replacement shaft and propeller for 50316-00, -04, -08, -12

## Accessories for Laboratory Mixers

### A-F Chucks, Collets, and Clamps

**A** Keyless Chucks let you securely fasten the mixing shaft to the mixer without a key.

Cat. no.	Fits motor shaft	Price
<a href="#">KH-50401-60</a>	1/4"	
<a href="#">KH-50401-61</a>	5/16"	
<a href="#">KH-50401-62</a>	3/8"	

**B** Adjustable Chuck accepts any mixing shaft from 1/16" to 3/8" dia (1.5 to 10 mm).

Cat. no.	Fits motor shaft	Price
<a href="#">KH-50003-50</a>	5/16"	

**C** Collets are ideal for high-speed motors.

Cat. no.	Fits motor shaft	Price
<a href="#">KH-04556-50</a>	1/4"	
<a href="#">KH-04558-50</a>	5/16"	

### G-J Stands

**G** Stand. Corrosion resistant, electropolished cast steel base; 303 SS support rod. Both legs accept an extra support rod.

**H** Spider Support Stands clamp onto the edges of square or rectangular pails, drums, and tanks. Model 50401-70 fits 5-gallon vessels; model 50401-71 fits 55-gallon vessels with rims up to 5/8" wide. Aluminum base has a stainless steel support rod.

**I** Mixer Stand has a cast-iron base and a stainless steel rod.

**J** 316 SS Mixer Stand accepts extra screw-in support rods in both legs.

Key	Catalog number	Dimensions	Price	Extra support rods	
				Cat. no.	Price
<a href="#">G</a>	<a href="#">KH-50001-92</a>	29"H x 5/8" dia		<a href="#">KH-50001-94</a>	
<a href="#">H</a>	<a href="#">KH-50401-70</a>	24"H x 5/8" dia		—	—
<a href="#">I</a>	<a href="#">KH-50401-71</a>	24"H x 5/8" dia		—	—
<a href="#">J</a>	<a href="#">KH-04546-00</a>	24"H x 5/8" dia		—	—
<a href="#">J</a>	<a href="#">KH-04344-00</a>	29"H x 5/8" dia		<a href="#">KH-04344-10</a>	



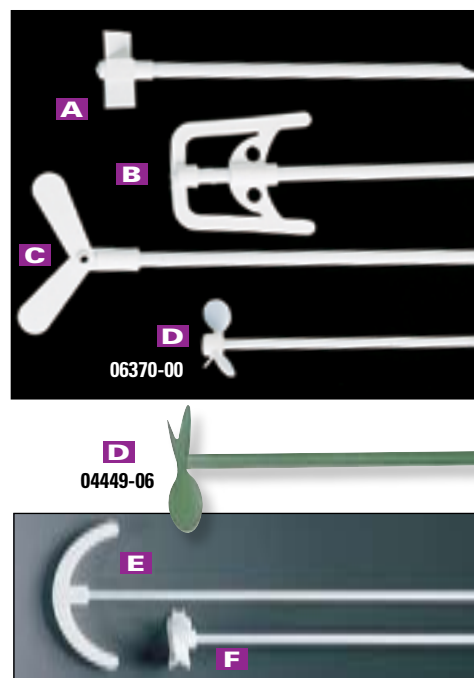
## Accessories for Laboratory Mixers

Cole-Parmer offers a wide range of accessories. See next three pages for more!

### A-F Plastic Mixing Paddle Assemblies

Use these plastic paddle assemblies for mixing most acids and corrosive solutions. Plastic-coated steel assemblies provide better chemical resistance than stainless steel alone.

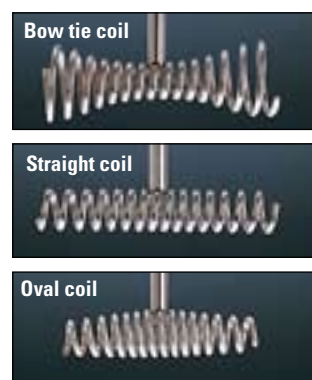
Catalog number	Material	Shaft (dia x L)	Max paddle diameter	Price
<b>A Fixed, dual-blade paddle assembly</b> —for mixing medium-viscosity liquids				
<a href="#">KH-06367-10</a>	Polypropylene	5/16" x 13 13/16"	1 1/2"	
<b>E A-shaped, blade paddle assembly</b> —for mixing highly viscous liquids				
<a href="#">KH-06367-20</a>	Polypropylene	5/16" x 13 13/16"	2 1/2"	
<b>C Swing-out, dual-blade paddle assembly</b> —for use in narrow-necked vessels				
<a href="#">KH-06367-40</a>	Polypropylene	5/16" x 13 13/16"	2 3/8"	
<a href="#">KH-06367-60</a>		5/16" x 13 13/16"	4"	
<b>D Three-blade paddle assembly</b> —for general-purpose mixing				
<a href="#">KH-06370-00</a>	Polyethylene	1/4" x 18"	1 3/4"	
<a href="#">KH-04449-06</a>	PTFE	5/16" x 12"	2"	
<a href="#">KH-04449-10</a>	PTFE	5/16" x 18"	2"	
<b>E Anchor-style paddle assembly</b> —for mixing medium- to high-viscosity liquids				
<a href="#">KH-06367-70</a>	PTFE	3/8" x 22"	4"	
<b>F Four-blade paddle assembly</b> —for mixing low- to medium-viscosity liquids				
<a href="#">KH-06367-80</a>	PTFE	3/8" x 22 1/8"	2 3/8"	



### G 304 Stainless Steel Coil Paddle Kits

These coil paddles give you excellent fluid dispersion and are 50% more efficient than standard propellers. Fluid is centrifugally thrown outward from the rotating coil ends, striking the container walls and flowing upward and downward. The fluid then circulates toward the lowest pressure zone—directly above and below the rotating coil. The fluid is drawn again into the coil body and thrown outward to repeat the flow pattern.

Paddle kits are supplied with coils of various sizes and shapes. Any kit coil can be interchanged by unthreading the mounted coil and threading the desired coil on to the shaft.



**Bow Tie Coils (BT)** are most efficient in low-viscosity materials (up to 12,000 centipoise). When resistance to rotation is relatively low, the coil's large surface area imparts energy into the fluid quickly.

**Straight Coils (ST)** are best for viscous materials (12,000 centipoise and up) because they provide less resistance to rotation. This shape is ideal for dissolving semisolids settled at the container bottom.

**Oval Coils (OV)** work best in blending dry, powdered materials or dispersing them into liquids. This shape has restricted discharge ends that cause fluids to spend fractions of a second longer in the coil.

Catalog number	Coil length and type	Shaft length	Price
<b>1/4" shaft diameter coil paddle kits</b>			
<a href="#">KH-50700-10</a>	1" BT; 3/8", 3/4" ST	8"	
<a href="#">KH-50700-11</a>	1 3/4" BT; 1 1/2", 2 3/8" ST	8"	
<a href="#">KH-50700-12</a>	1 3/4" BT; 1 1/2", 2 3/8" ST	12"	
<a href="#">KH-50700-13</a>	2 3/4" BT; 1 3/4", 2 1/2" ST	8"	
<a href="#">KH-50700-14</a>	2 3/4" BT; 1 3/4", 2 1/2" ST	12"	
<b>3/8" shaft diameter coil paddle kits</b>			
<a href="#">KH-50700-15</a>	3 1/2" BT; 3 1/2" ST; 4" OV	12"	
<a href="#">KH-50700-16</a>	5" BT; 3 1/2" ST; 4" OV	24"	

### H Assembly Kit for Closed System Mixing

Assembly kit is designed for continuous mixing under vacuum or positive pressure; safely use it down to 10<sup>-6</sup> torr. For atmospheric mixing, simply remove the leaktight O-ring. This contamination-free system operates to 1000 rpm without binding. The shaft is encircled by a PTFE bearing and is tightened with stainless steel hex nuts.



PTFE seal assembly prevents leakage (glassware is not included).

Kit consists of a PTFE seal assembly, 1 1/2" glass mixing shaft, PTFE standard taper joint, two PTFE mixing blades (3" and 4"), one Viton® O-ring, and an aluminum adapter chuck for 1/4" to 3/8" collet chucks. Order replacement shafts and blades below.

Cat. no.	Glass joint size	Price
<a href="#">KH-04740-00</a>	24/40	
<a href="#">KH-04740-10</a>	29/42	

**Glass Mixing Shafts** of borosilicate glass are ground and polished for smooth rotation.

Cat. no.	Shaft dia (L)	Length	Price
<a href="#">KH-04740-14</a>	3/8" (10 mm)	14 1/2"	
<a href="#">KH-04740-15</a>		20"	
<a href="#">KH-04740-17</a>		25"	
<a href="#">KH-04740-19</a>		30"	

**PTFE Mixing Blades** are reversible to match the shape of round- or flat-bottom vessels.

Cat. no.	Blade length	Price
<a href="#">KH-04740-20</a>	2 3/8"	
<a href="#">KH-04740-30</a>	3"	
<a href="#">KH-04740-40</a>	4"	
<a href="#">KH-04740-50</a>	5 1/8"	

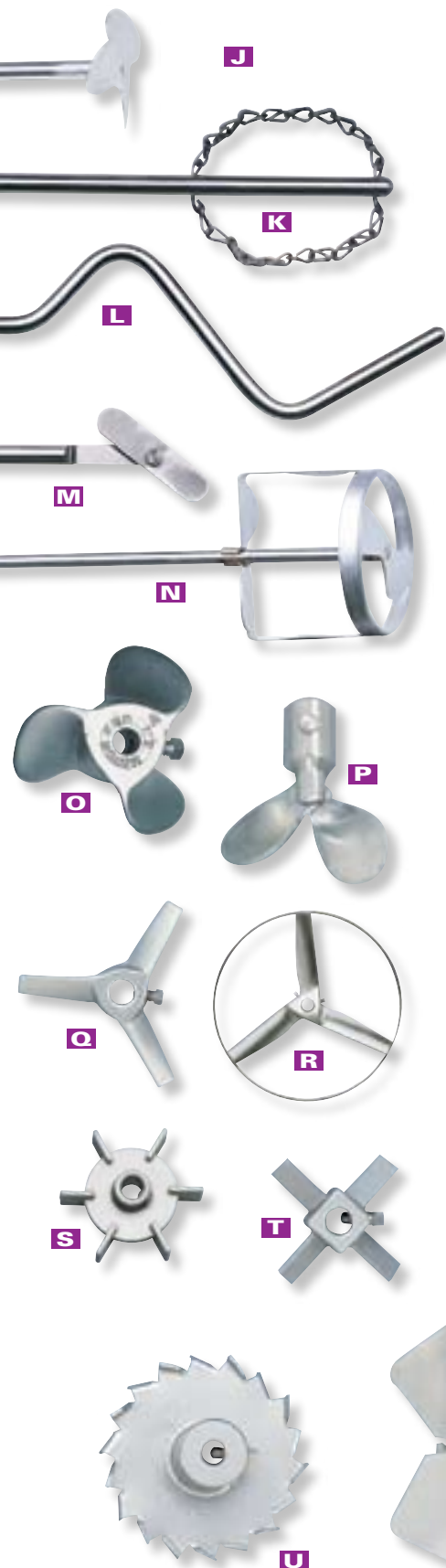
### L Mixer Testing Beads

Test your mixer/impeller system for clumping and settling. These highly visible beads are calibrated to simulate particles in your fluid and let you easily visualize mixing patterns. Use both sizes simultaneously to determine effect on different sized particles.

Cat. no.	Color	Bead diameter	Price
<a href="#">KH-04560-70</a>	Red	4.5 mm	
<a href="#">KH-04560-71</a>	Yellow	3 mm	

# Mi Mixers

## Accessories



## Accessories for Laboratory Mixers (continued)

### J-N 303/304 Stainless Steel Mixing Paddle Assemblies

Use these autoclavable paddle assemblies for your general-purpose and high-temperature applications. The shaft and propeller are combined into one convenient mixing piece.

**J Three-Blade Paddle Assemblies** are for general purpose mixing. All blades are pitched for low-viscosity, axial-flow mixing.

**K Chain Paddle Assemblies** are for medium-viscosity liquids.

**L Zig-Zag Paddle Assemblies** are for medium- to high-viscosity liquids.

**M Swivel Paddle Assemblies** are for use in narrow-necked vessels.

**N High-Efficiency Paddle Assemblies** are for highly viscous liquids or semisolids.

### O-W 316 SS Impellers

Choose from a variety of impeller designs; all are constructed of 316 stainless steel except high-flow impeller 04560-80. Order shafts separately on page 999.

**O Axial Flow Impellers** (Lightnin A-100) have Superpitch® design with a 1.5 pitch ratio for greater mixing capabilities. Standard axial flow; use for wetting dry powders.

**P Two-Blade Folding Impellers** are perfect for mixing in vessels with narrow ports. Folded diameter is 1 $\frac{1}{16}$ " for the 2" model and 1" for the 3" model. Impellers open fully when mixing.

**Q High-Efficiency Axial Flow Impellers** (Lightnin A-310) have laser designed paddles to develop 50% more mixing action for high-flow, low-shear mixing.

**R High-Efficiency Axial Flow Impeller with Ring Guard** (Lightnin A-310) has all the features of "Q" with added ring guard for safety and protection of mixing vessels.

**S High-Shear Radial Flow Impellers** (Lightnin R-100) have paddles that produce added shear and moderate flow.

**T Four-Blade Impellers** (Lightnin A-200) are turbine impellers that have a 45° pitch and produce a semi-axial flow.

**U High-Shear Dispersing Impellers** (Lightnin R-500) create a cutting, tearing action to efficiently shred and disperse solids. Provide low flow with highest shear.

Key	Catalog number	Shaft (dia x L)	Paddle dia	Price
J	KH-04350-00	¼" x 12"	2"	
	KH-04352-00	⅝" x 12"		
	KH-04449-07	¼" x 18"		
K	KH-04354-00	¼" x 12"	3"	
	KH-04356-00	⅝" x 12"		
L	KH-04358-00	⅝" x 12"	2½"	
M	KH-04360-00	¼" x 12"	2"	
	KH-04361-00	⅝" x 12"		
N	KH-04541-00	¼" x 15"	2½"	
	KH-04541-10	¼" x 30"	2½"	
	KH-04541-20	¾" x 21"	3¾"	
	KH-04541-30	½" x 40"	5"	

**GO to page(s) 992**

You'll find accessories compatible with industrial mixers on page 992.

**V Laser Designed High-Viscosity Impellers** (Lightnin A-320) improve blending while reducing power consumption—up to a 50% reduction over traditional 45° pitched blade paddles. Increased axial flow lets you locate the impeller farther from your tank bottom and enables use of shorter shafts.

**W Laser Designed High-Flow Impeller** (Lightnin A-410) produces strong axial flow at very high flow efficiency. Ideal for transitional flow regime mixing. Made of glass-filled polypropylene with 316 SS set screws.

Key	Catalog number	Overall dia	Bore dia	Price
O	KH-04560-54	3.1"	⅝"	
	KH-04540-20	2.7"	⅜"	
	KH-04540-30	3.1"	⅜"	
P	KH-04543-00	2.0" open	⅝"	
	KH-04561-66	3.0" open	⅜"	
Q	KH-04560-25	2.5"	⅝"	
	KH-04560-22	3.8"	⅝"	
	KH-04560-23	4.5"	⅝"	
	KH-04560-50	2.5"	⅜"	
	KH-04540-25	3.4"	⅜"	
R	KH-04561-64	2.5"	⅝"	
S	KH-04560-57	1.5"	⅝"	
	KH-04560-30	2.0"		
	KH-04560-56	3.0"		
T	KH-04560-60	3.0"	⅝"	
	KH-04561-60	2.0"	⅝"	
	KH-04560-61	2.0"	⅜"	
U	KH-04561-62	3.0"	⅝"	
	KH-04560-58	2.0"	⅜"	
V	KH-04560-62	5.0"	⅝"	
	KH-04560-63	5.0"	⅜"	
W	KH-04560-80	3.9"	⅝"	



### Mixer Testing Beads

Test your mixer/impeller system for clumping and settling—see page 997.

## Accessories for Laboratory Mixers (continued)

### X-EE General-Purpose 316 SS Shafts, Extension Rods, Sleeves, and Propellers

**X Shafts.** All  $\frac{3}{8}$ " dia shafts are machined on one end to accept a  $\frac{5}{16}$ " bore dia propeller.

Catalog number	Shaft dimensions	Price
<a href="#">KH-04553-50</a>	$\frac{5}{16}$ " dia x 12"L	
<a href="#">KH-04553-52</a>	$\frac{3}{8}$ " dia x 12"L	
<a href="#">KH-04553-55</a>	$\frac{5}{16}$ " dia x 18"L	
<a href="#">KH-04553-57</a>	$\frac{3}{8}$ " dia x 18"L	
<a href="#">KH-04537-10</a>	$\frac{3}{8}$ " dia x 24"L	
<a href="#">KH-04538-10</a>	$\frac{3}{8}$ " dia x 30"L	

### Y-Z Extension Rods and Sleeves

increase the length of your shaft. One sleeve is required to connect each extension rod to your shaft.

L	$\frac{1}{4}$ " dia rods		$\frac{5}{16}$ " dia rods	
	Cat. no.	Price	Cat. no.	Price
<b>Y Extension rods;</b> include Allen wrench				
6"	<a href="#">KH-04366-10</a>		<a href="#">KH-04367-10</a>	
12"	<a href="#">KH-04366-20</a>		<a href="#">KH-04553-50</a>	
18"	<a href="#">KH-04366-30</a>		<a href="#">KH-04553-55</a>	
<b>Z Sleeves;</b> for use with extension rods above				
3"	<a href="#">KH-04363-00</a>		<a href="#">KH-04364-00</a>	

### FF-KK High-Shear 304 SS Metric Shaft and Propellers

**FF Mixing Shaft** for use with any 10 mm dia or adjustable  $\frac{3}{8}$ " dia chuck. Measures 10 mm dia X 500 mm L. Threaded shaft end accepts only propellers "GG" through "KK".

[KH-04370-02](#) Mixing shaft

**GG Midshaft Turbine Propeller** for multistage mixing. Use with a 10 mm dia shaft (model 04370-02 above) or any  $\frac{3}{8}$ " OD shaft. Mount along a single shaft with turbine propellers below.

**HH Turbine Propellers** for airless mixing in deep containers. Mount singly or with one or more midshaft propellers (model 04370-17 above) for a multistage system. Threaded 10 mm dia bore requires shaft 04370-02 (above).

**II Dual-Blade Propellers** for viscous fluids. Threaded 10 mm dia bore fits only shaft model 04370-02 (above).

### LL Pyrex® Glass Paddle Assembly

Dual-blade paddle is ideal for corrosive or ultrapure liquids with a high viscosity. This one-piece molded glass paddle withstands high-temperature applications and is autoclavable. Rod measures 10 mm\* dia x 19 $\frac{3}{8}$ "L. Paddle diameter is 2 $\frac{3}{8}$ ". Use with flexible couplings, listed at right.

[KH-04370-20](#) Glass paddle assembly

\*Paddle assembly can also be used with any adjustable  $\frac{3}{8}$ " chuck.

**GO to page(s) 973-987**

Our laboratory mixers are on pages 973-987.

**AA Turbine Propellers** are for airless mixing in deep containers.

**BB Three-Blade Propellers** are for general-purpose mixing. Use alone or mount several on a single shaft for thorough agitation.

**CC Lightweight Three-Blade Propellers** have blades that twist to achieve the desired pitch.

**DD Folding Propeller** is for use in narrow-mouth vessels. Folded diameter is 1 $\frac{1}{16}$ ".

**EE Ring Guard Propeller** protects dip tubes or sensors in your mixing vessel.

Key	Catalog number	Overall dia	Bore dia	Price
<b>AA</b>	<a href="#">KH-04544-00</a>	2"	$\frac{5}{16}$ "	
	<a href="#">KH-04544-10</a>	2"	$\frac{3}{8}$ "	
<b>BB</b>	<a href="#">KH-04553-60</a>	1"	$\frac{5}{16}$ "	
	<a href="#">KH-04553-62</a>	1 $\frac{1}{2}$ "	$\frac{5}{16}$ "	
	<a href="#">KH-04553-64</a>	2"	$\frac{3}{16}$ "	
	<a href="#">KH-04553-65</a>	2"	$\frac{3}{8}$ "	
<b>CC</b>	<a href="#">KH-04553-68</a>	3"	$\frac{5}{16}$ "	
	<a href="#">KH-04349-10</a>	2"	$\frac{1}{4}$ "	
<b>DD</b>	<a href="#">KH-04349-00</a>	3 $\frac{1}{2}$ "	$\frac{5}{16}$ "	
	<a href="#">KH-04543-00</a>	2" open	$\frac{5}{16}$ "	
<b>EE</b>	<a href="#">KH-04545-00</a>	2"	$\frac{5}{16}$ "	

**JJ Four-Blade Propellers** are for general purpose vortex mixing. Threaded 10 mm dia bore fits only shaft model 04370-02 (at left).

**KK Folding Propeller** is for use in narrow-mouth vessels. Folded diameter is 18 mm. Threaded 10 mm dia bore fits only shaft model 04370-02 (at left).

Key	Cat. no.	Overall diameter	Price
<b>GG</b>	<a href="#">KH-04370-17</a>	60 mm	
<b>HH</b>	<a href="#">KH-04370-15</a>	60 mm	
	<a href="#">KH-04370-16</a>	100 mm	
<b>II</b>	<a href="#">KH-04370-18</a>	100 mm	
	<a href="#">KH-04370-19</a>	28 mm	
<b>JJ</b>	<a href="#">KH-04370-11</a>	75 mm	
	<a href="#">KH-04370-12</a>	60 mm	
	<a href="#">KH-04370-13</a>	40 mm	
<b>KK</b>	<a href="#">KH-04370-14</a>	48 mm (open)	

### MM Flexible Couplings

Flexible couplings are for use with glass mixing shafts. Rubber-bodied sleeve lets you make connections without a rubber hose—absorbs shock and reduces mixer noise and vibration. Couplings measure 4" long.

Catalog number	Fits mixing shaft OD	Fits motor shaft OD	Price
<a href="#">KH-50401-50</a>	10 mm	$\frac{1}{4}$ "	
<a href="#">KH-50401-53</a>		$\frac{5}{16}$ "	
<a href="#">KH-50401-51</a>		$\frac{3}{8}$ "	
<a href="#">KH-50401-54</a>		$\frac{1}{2}$ "	
<a href="#">KH-50401-52</a>	19 mm	$\frac{3}{8}$ "	
<a href="#">KH-50401-55</a>		$\frac{1}{2}$ "	
<a href="#">KH-50401-56</a>		$\frac{5}{8}$ "	
<a href="#">KH-50401-57</a>		$\frac{3}{4}$ "	



# Mi Mixers

## Static

### In-Line Static Mixers

#### Mix fluids as you pump them through a pipe line

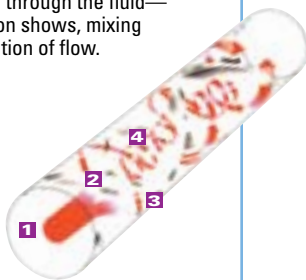
- These economical, long-lasting, in-line mixers are more convenient than most motorized mixers
- In-line mixers prevent overmixing and undermixing, and resist fouling in your pipes or tubes
- Virtually maintenance free and need no spare parts

In-line mixers are efficient and can withstand large pressure changes—up to 1500 psi with smallest sizes. Mixing elements in pipe and tube mixers are securely attached to the mixer walls, so internal pressure changes cannot collapse elements and stop flow.

#### Technical info

With in-line static mixers, the mixer does not move through the fluid—the fluid moves through the mixer. As this illustration shows, mixing takes place around the center-line and in the direction of flow.

- 1 Pump pushes a stream of liquid into the mixer.
- 2 The stream of liquid is then split and forced to the opposite outside walls.
- 3 A vortex is created along the centerline axis of the pipe.
- 4 The vortex is sheared and the process recurs with the opposite rotation. This clockwise/counterclockwise motion mixes the liquid to ensure a homogeneous end product.



Use the Reynolds equation and the table below to determine the minimum number of elements you need for efficient mixing.

$$\text{Reynolds equation: } Re = \frac{3157QS}{\mu D}$$

Re = Reynolds number

- Q = Flow rate (gallons per minute)

- S = Specific gravity

-  $\mu$  = Viscosity (centipoise)

- D = Inside pipe diameter (inches)

Reynolds number	Elements required
>1000	6
500 to 1000	12

Note: If the Reynolds number is less than 500, call our Application Specialists for assistance.

#### Disposable In-Line Mixers

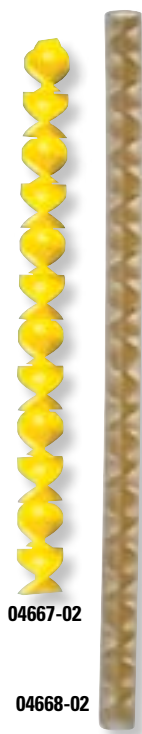
Ideal for your one-time mixing applications, these disposable polyacetal mixers are available unmounted or mounted in polypropylene tubing. Adjust unmounted mixer length to get optimal mixing action—shorten by cutting or extend by using more than one mixer.

**Unmounted Mixers** can be used with any standard tubing having the same tubing ID as the element OD given in the table. They work well with flexible tubing.

Catalog number	Element OD (tubing ID)	Number of elements	Mixer length	Price/pk of 10
<a href="#">KH-04667-02</a>	3/16"	12	2 3/8"	
<a href="#">KH-04667-12</a>		24	4 5/8"	
<a href="#">KH-04667-04</a>	1/4"	12	3"	
<a href="#">KH-04667-14</a>		24	6"	
<a href="#">KH-04667-06</a>	3/8"	12	4 3/4"	
<a href="#">KH-04667-16</a>		24	9 1/2"	
<a href="#">KH-04667-08</a>	1/2"	12	5"	
<a href="#">KH-04667-18</a>		24	10"	

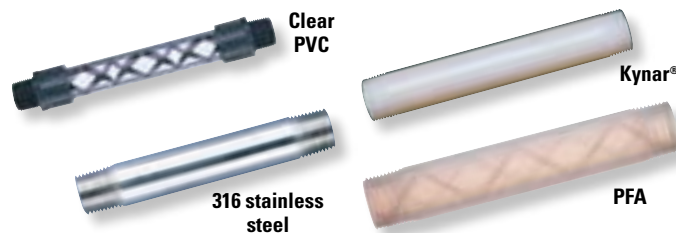
**Mounted Mixers** can be used with any compression fitting with the same tubing OD.

Catalog number	Tubing OD	Number of elements	Mixer length	Price/pk of 10
<a href="#">KH-04668-02</a>	5/16"	12	3 1/2"	
<a href="#">KH-04668-12</a>		24	5 3/4"	
<a href="#">KH-04668-04</a>	3/8"	12	4 1/4"	
<a href="#">KH-04668-14</a>		24	7 1/4"	
<a href="#">KH-04668-06</a>	1/2"	12	6 1/2"	
<a href="#">KH-04668-16</a>		24	11 1/4"	
<a href="#">KH-04668-08</a>	5/8"	12	8 1/2"	
<a href="#">KH-04668-18</a>		24	14 1/2"	



#### Pipe Mixers

Install these mixers directly into your process line to achieve a 100% mixed output—mixing elements are welded inside the pipe. All mixers have threaded ends. Choose PVC, 316 stainless steel, Kynar®, or PFA. The clear PVC mixers are ideal for a visual check of your mixing processes. Models with removable elements are available on request—call our Application Specialists for details.



Catalog number	NPT(M)	Pipe ID	No. of elements	Mixer length	Price
<b>Clear PVC schedule 40 pipe mixers</b>					
<a href="#">KH-04669-85</a>	3/8"	0.473"	6	6 1/2"	
<a href="#">KH-04669-87</a>			12	11"	
<a href="#">KH-04669-89</a>	1/2"	0.602"	6	7"	
<a href="#">KH-04669-91</a>			12	12"	
<a href="#">KH-04669-92</a>	3/4"	0.804"	6	9"	
<a href="#">KH-04669-93</a>			12	15"	
<a href="#">KH-04669-94</a>	1"	1.029"	6	11"	
<a href="#">KH-04669-95</a>			12	18"	
<a href="#">KH-04669-96</a>	1 1/2"	1.590"	6	15"	
<a href="#">KH-04669-97</a>			12	28"	
<a href="#">KH-04669-98</a>	2"	2.047"	6	19"	
<a href="#">KH-04669-99</a>			12	35"	

#### Standard PVC schedule 80 pipe mixers

<a href="#">KH-04669-00</a>	1/2"	0.62"	6	5"	
<a href="#">KH-04669-06</a>			12	10"	
<a href="#">KH-04669-02</a>	3/4"	0.82"	6	7"	
<a href="#">KH-04669-08</a>			12	14"	
<a href="#">KH-04669-04</a>	1"	1.05"	6	10"	
<a href="#">KH-04669-10</a>			12	19"	
<a href="#">KH-04669-78</a>	1 1/2"	1.50"	6	15"	
<a href="#">KH-04669-79</a>			12	26"	
<a href="#">KH-04669-83</a>	2"	1.939"	6	18"	
<a href="#">KH-04669-81</a>			12	33"	

#### 316 stainless steel pipe mixers

<a href="#">KH-04669-12</a>	1/2"	0.62"	6	5"	
<a href="#">KH-04669-18</a>			12	10"	
<a href="#">KH-04669-14</a>	3/4"	0.82"	6	7"	
<a href="#">KH-04669-20</a>			12	13"	
<a href="#">KH-04669-16</a>	1"	1.05"	6	9"	
<a href="#">KH-04669-22</a>			12	17"	
<a href="#">KH-04669-23</a>	1 1/2"	1.61"	6	13"	
<a href="#">KH-04669-24</a>			12	26"	
<a href="#">KH-04669-25</a>	2"	2.067"	6	17"	
<a href="#">KH-04669-26</a>			12	33"	

#### Kynar® schedule 80 pipe mixers

<a href="#">KH-04669-28</a>	1/2"	0.546"	6	5"	
<a href="#">KH-04669-29</a>			12	9"	
<a href="#">KH-04669-30</a>	3/4"	0.82"	6	6"	
<a href="#">KH-04669-34</a>			12	12"	
<a href="#">KH-04669-32</a>	1"	1.05"	6	8"	
<a href="#">KH-04669-36</a>			12	15"	
<a href="#">KH-04669-38</a>	1 1/2"	1.50"	6	12"	
<a href="#">KH-04669-40</a>			12	24"	
<a href="#">KH-04669-42</a>	2"	1.939"	6	16"	
<a href="#">KH-04669-44</a>			12	31"	

#### Teflon® PFA schedule 80 pipe mixers

<a href="#">KH-04668-20</a>	1/2"	0.546"	6	5"	
<a href="#">KH-04668-22</a>			12	9"	
<a href="#">KH-04668-24</a>	3/4"	0.742"	6	6"	
<a href="#">KH-04668-26</a>			12	12"	

## PVC Mixers

**PVC Mixers with Injection Port** are designed for blending light-viscosity chemicals into a water stream. Each mixer is constructed of schedule 80 PVC and has four fixed mixing elements. Connections are 150 lb raised face flanged ends.

**Note:** these mixers are designed for high flow rates. They use four elements instead of six to minimize pressure loss.

**PVC In-Line Mixers without Injection Port** are designed for blending light-viscosity treatment chemicals into a water stream. Each mixer is constructed of schedule 80 PVC and has four fixed, solid PVC mixing elements. Maximum working pressure is 150 psi. Connections are 150 lb raised face flanged ends.

Catalog number	Line size	Injection port NPT(F)	Mixer length	Flow range (GPM)	Pressure loss (psi)	Price
<b>PVC mixers with injection port</b>						
<a href="#">KH-04668-60</a>	1"	½"	12"	5 to 15	0.75 to 6.7	
<a href="#">KH-04668-62</a>	1½"	½"	16"	15 to 35	1.1 to 6.2	
<a href="#">KH-04668-64</a>	2"	¾"	19"	25 to 60	1.1 to 6.2	
<a href="#">KH-04668-66</a>	2½"	¾"	22"	35 to 100	0.8 to 6.4	
<a href="#">KH-04668-68</a>	3"	¾"	27"	60 to 150	0.9 to 5.7	
<a href="#">KH-04668-70</a>	4"	¾"	32"	90 to 250	0.7 to 5.3	
<a href="#">KH-04668-72</a>	6"	1"	41"	175 to 500	0.6 to 4.8	

Catalog number	Line size	Injection port NPT(F)	Mixer length	Flow range (GPM)	Pressure loss (psi)	Price
<b>PVC mixers without injection port</b>						
<a href="#">KH-04668-61</a>	1"	—	7"	5 to 15	0.75 to 6.7	
<a href="#">KH-04668-63</a>	1½"	—	10"	15 to 35	1.1 to 6.2	
<a href="#">KH-04668-65</a>	2"	—	12"	25 to 60	1.1 to 6.2	
<a href="#">KH-04668-67</a>	2½"	—	14"	35 to 100	0.8 to 6.4	
<a href="#">KH-04668-69</a>	3"	—	18"	60 to 150	0.9 to 5.7	
<a href="#">KH-04668-71</a>	4"	—	23"	90 to 250	0.7 to 5.3	
<a href="#">KH-04668-73</a>	6"	—	33"	175 to 500	0.6 to 4.8	



PVC mixer with injection port 04668-66



PVC mixer without injection port 04668-63

**GO to ColeParmer.com**

Search our online catalog for sanitary static mixers sizes up to 4".



## Tube Mixers

These mixers consist of a series of fixed right- and left-hand elements. Tube and mixing elements are made of 316 stainless steel—ideal for mixing high-viscosity fluids such as epoxies. Mixers have plain ends and accept standard tube fittings (see "Fittings—Compression" section for compression fittings).

Catalog number	Tube OD	No. of elements	Tube ID	Mixer length	Viscosity (cp)	Price
<a href="#">KH-04669-50</a>	⅜"	17	0.13"	4⅞"	0 to 200	
<a href="#">KH-04669-52</a>		21		6"	0 to 200	
<a href="#">KH-04669-54</a>		27		7½"	200 to 750	
<a href="#">KH-04669-56</a>	¼"	21	0.19"	7"	0 to 200	
<a href="#">KH-04669-58</a>		27		9¼"	200 to 750	
<a href="#">KH-04669-60</a>		34		11½"	750 and up	
<a href="#">KH-04669-62</a>	⅜"	21	0.32"	11"	0 to 200	
<a href="#">KH-04669-64</a>		27		14"	200 to 750	
<a href="#">KH-04669-66</a>		32		17"	750 and up	
<a href="#">KH-04669-68</a>	½"	15	0.43"	11⅞"	0 to 200	
<a href="#">KH-04669-70</a>		21		16⅞"	0 to 200	
<a href="#">KH-04669-72</a>		32		24¾"	750 and up	

## Sanitary Mixers

These mixers are made of 316 stainless steel for low- or high-viscosity food processing. All internal surfaces are ground and polished to a sanitary (#4) finish and have removable elements for cleaning and visual inspection.

**Blade Design Mixers** are best for low viscosity (<1,500 Cp) fluids. The faster the fluid moves, the faster (and more thorough) the mixing. Great for mixing products into water or water-like fluids.

**Helical Design Mixers** are best for high-viscosity (>1,500 Cp) fluids, and when fluids are moving more slowly through the mixer. Excellent for combining products into fluids such as yogurt, mayonnaise, and ice cream.

Tri-Clamp® size	Number of elements	Pipe ID	Helical design			Blade design		
			Catalog number	Length	Price	Catalog number	Length	Price
½"	6	0.37"	<a href="#">KH-04668-75</a>	5½"		<a href="#">KH-04668-28</a>	4"	
	12		<a href="#">KH-04668-76</a>	10½"		<a href="#">KH-04668-30</a>	8"	
¾"	6	0.62"	<a href="#">KH-04668-77</a>	7"		<a href="#">KH-04668-32</a>	6½"	
	12		<a href="#">KH-04668-78</a>	13"		<a href="#">KH-04668-34</a>	11"	
1"	6	0.87"	<a href="#">KH-04668-79</a>	9"		<a href="#">KH-04668-36</a>	7"	
	12		<a href="#">KH-04668-80</a>	18"		<a href="#">KH-04668-38</a>	14"	
1½"	6	1.37"	<a href="#">KH-04668-81</a>	14"		<a href="#">KH-04668-40</a>	12"	
	12		<a href="#">KH-04668-82</a>	27"		<a href="#">KH-04668-42</a>	24"	
2"	6	1.87"	<a href="#">KH-04668-83</a>	18"		<a href="#">KH-04668-44</a>	15"	
	12		<a href="#">KH-04668-84</a>	36"		<a href="#">KH-04668-46</a>	30"	



## Accessories

[KH-30519-00](#) Sanitary clamp for ½" or ¾" sizes

[KH-30519-01](#) Sanitary clamp for 1 to 1½" sizes

[KH-30519-03](#) Sanitary clamp for 2" size

# Mi Mixers

## Powder



Manual powder mixer 50353-00

## Manual Powder Mixer

**Manual power mixer provides homogenous, three-dimensional mixing of powders and small solids**

- Ideal for thermo-sensitive materials—no heat source or motor that could possibly overheat

Mix up to 1.7-L of powders, grains, flakes, or other dry material in a single batch. Simply deposit sample material into mixing container (included), secure the lid, and slide into mixing cradle.

The metal cradle supports a number of different-sized containers; all containers are held firmly in place by restraining straps. Spin the container to start the mixing process. The metal cradle spins on two axes, blending sample materials through a combination of rotating and inverting motions. Space-saving design can be table- or wall-mounted.

### Specifications & Ordering Information

Catalog number	Dimensions	Price
<a href="#">KH-50353-00</a>	13¾"L x 13"W x 9¾"H	

[KH-50353-05](#) Mixing container adapter for container smaller than 1.7 L included container



51606-00

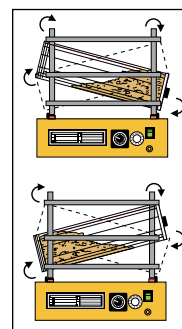
## Twisting Powder Mixer

**Thoroughly mix up to 6-liters of powdered material in one batch**

Ideal for the lab that blends powders, grains, flakes, tablets, or other dry materials for analysis. Cylinder holds a maximum of six liters. As the motor spins the cylinder, three-dimensional twisting action thoroughly mixes the contents.

Front control panel features a main power switch, start switch, speed dial, and a timed run switch. Select from one of three timer settings: 1 to 6 minutes, 1 to 12 minutes, or 1 to 12 hours.

**What's included:** The 110 VAC model includes a 6-ft cord with U.S. standard plug; 220 VAC model includes a 6-ft cord with European plug.



**Three-dimensional twisting action thoroughly blends samples**

### Specifications & Ordering Information

Catalog number	Dimensions	Speed (rpm)	Capacity	Power (VAC)	Price
<a href="#">KH-51606-00</a>	18½"L x 15¾"W x 20¼"H	2 to 40	Up to 6 L	110	
<a href="#">KH-51606-05</a>				220	

[KH-51606-10](#) Replacement mixing cylinder

## Dry Powder Rocking Shaker

**Unique mixing motion tosses powder from end-to-end while rotating it within the vessel**

- Adjustable tilt capability and variable speed control let you achieve mixing action similar to hand mixing
- Adjustable silicone-lined rack will not deteriorate
- Ideal for mixing pharmaceutical powders, flour, grains, and food powder

**What's included:** The 120 VAC model includes a 6-ft three-wire cord with U.S. standard plug; the 240 VAC model includes a 6-ft cord with European plug.

### Specifications & Ordering Information

**Shaking angle:** 20° **Ambient conditions:** 32 to 100°F (0 to 37°C); 0 to 90% RH, noncondensing

Catalog number	Dimensions	Speed range	Maximum load	Power (VAC, Hz, Amps)	Price
<a href="#">KH-51605-00</a>	17"L x 12"W x 12"H	2 to 60 rpm	15 lb	120, 50/60, 1.5	
<a href="#">KH-51605-15</a>				240, 50/60, 0.75	



See-saw motion provides gentle, uniform mixing

51605-00

