MagneDrives®

Agitation

Parker Autoclave Engineers MagneDrive® is a magnetically coupled, packless rotary impeller system designed to provide continuous high speed mixing without leakage or contamination. Utilizing the rare earth magnetic technology which Parker Autoclave Engineers developed and was the first to market in 1958, the packless MagneDrive® eliminates the process contamination, lubrication, packing friction, shaft cooling and maintenance problems common with other forms of mixing.

MagneDrive® is a completely sealed, closed sytem with metal-to-metal or O-ring seals. The incorporation of a leak-free mixing system enables researchers to process hazardous/toxic fluids without fear of fugitive emissions. Parker Autoclave Engineers has continually improved the magnetics of the MagneDrive® to provide increased horsepower and torque in a smaller package.

These improvements have extended the capacities, speeds and viscosity handling capabilities for the MagneDrive®, allowing more applications to utilize this environmentally safe mixing system. MagneDrives® are available with the Dispersimax Gas Dispersion Impeller System (and others) which utilizes a hollow shaft to draw gases into the impeller and propel them into the liquid for maximum gas dispersion.

MagneDrives® are available in four (4) magnet diameters and several models which can be retrofitted for existing vessels or customer supplied vessels. For high temperature applications, air and water cooling are available. Parker Autoclave Engineers will custom design a MagneDrive® for individual mixing requirements.

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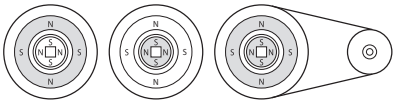
Applications

- High speed mixing
- Lethal service
- Hydrogenation
- Low to moderate torque
- Contaminant sensitive process
- Blending
- High pressure service
- Gas Dispersion
- Suspension of particles

* Consult factory for other applications

The MagneDrive® Principle:

MagneDrive® agitators use rare earth magnets, permitting packless mixing at higher speeds in larger vessels and with higher viscosity fluids. Outer drive magnets, rotated by a motor-driven belt, exert powerful attraction on the encapsulated inner magnet assembly. As the outer drive magnets are rotated, the inner magnets are actuated, resulting in rotation of the agitator shaft.

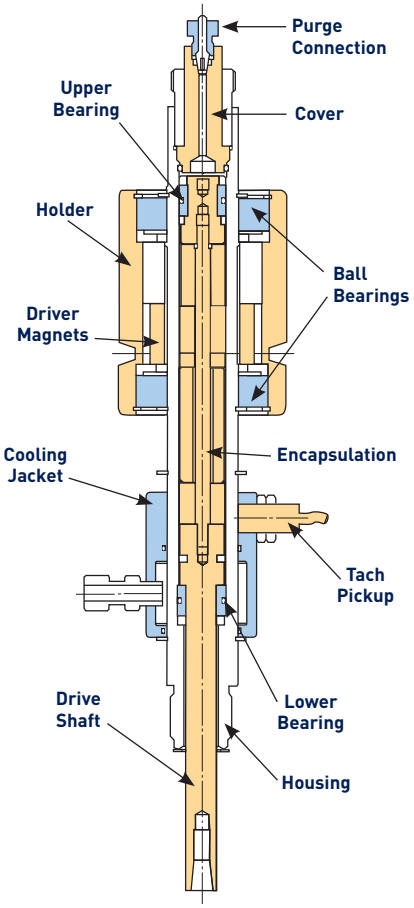


External Driver Magnets | Encapsulated Driver Magnet Assembly and Sealed Rotor Shaft | Outer magnets are rotated by motor-driven belts thus rotating inner magnets and rotor shaft.

MagneDrives® for containment-free packless agitation

MAG075 Belt Drive

Parker Autoclave Engineers MAG075 Series MagneDrive® with enhanced design provides improved bearing life and the ability to increase the MagneDrive® torque capacity with the substitution of a high torque stator module. This module allows the user to easily convert between 7 in-lbs (.8Nm) and 16 in-lbs (1.8Nm) static mixing torque. The MAG075 utilizes a solid state magnetically sensitive pickup for general purpose or explosion proof (requires Intrinsic Safety Barriers) applications. For more information, refer to bulletin "MAG075 Series MagneDrive®" or consult factory.



MAG075 SERIES

iMAG075 Inline Drive

Parker Autoclave Engineers iMAG075 inline Series MagneDrive® uses a direct inline motor to eliminate belts, reduce size and create nearly silent operation. The unit has a compact design with up to 7 in-lbs. (791 N-mm) at static torque. The unit is desinged for simple disassembly and maintenance. Bearings can be replaced with minimal effort.

iMAG075 SERIES

MAG3050 Inline Drive

The MAG3050, used in the Mini-Reactor product, is also available as an individiual unit. In-line motor eliminates belts, reduces size and creates nearly silent operation. It has a compact design with up to 5 in-lbs. (565 N-mm) of static torque. Designed for simple disassembly and maintenance. Bearings can be replaced in seconds from top or bottom.

MAG3050 SERIES

MagneDrive® Specifications:

SERIES	Shaft Coupling	Shaft Diameter inches (mm)	Pressure PSI (Bar)	Maximum Speed RPM[1]	Average Static Torque inch-lbs (N-m)	HP @ Maximum Speed RPM[2,3]
MAG3050	None	5/16 (7.5)	6000 (414)	3600	5 (.56)	0.24 @ 3000
iMAG075	Tapered Thread	1/2 (12.7)	6000 (414)	2500	7 (0.8)	0.28 @ 2500
MAG07501	Tapered Thread	1/2 (12.7)	6000 (414)	3300	7 (0.8)	0.36 @ 3300
MAG07502	Tapered Thread	1/2 (12.7)	6000 (414)	3300	16 (1.8)	0.86 @ 3300
1.5001AS*_A&C	Pinned	3/8 (9.53)	6000 (414)	2500	27 (3.0)	1.07 @ 2500
1.5001AS*_CBD	Pinned	5/8 (15.88)	6000 (414)	2500	27 (3.0)	1.07 @ 2500
1.5001SS*	Pinned	5/8 (15.88)	4400 (304)	2500	27 (3.0)	1.07 @ 2500
1.5002AS*	Threaded	3/4 (19.05)	6000 (414)	2000	60 (6.6)	1.90 @ 2000
1.5002SR*	Threaded	3/4 (19.05)	3300 (229)	2000	60 (6.6)	1.90 @ 2000
1.5004	In-Tank Coupling	7/8 (22.22)	3000 (207)	3250	120 (14)	6.19 @ 3250
1.5006	In-Tank Coupling	7/8 (22.22)	3000 (207)	3000	180 (20)	8.57 @ 3000
1.5008	In-Tank Coupling	7/8 (22.22)	3000 (207)	3000	240 (27)	11.42 @ 3000
1.5010	In-Tank Coupling	7/8 (22.22)	3000 (207)	2750	300 (34)	13.09 @ 2750
2.7504	In-Tank Coupling	1-1/2 (38.1)	3000 (207)	1700	284 (32)	7.66 @ 1700
2.7506	In-Tank Coupling	1-1/2 (38.1)	3000 (207)	1500	426 (47)	10.14 @ 1500
2.7508	In-Tank Coupling	1-1/2 (38.1)	3000 (207)	1400	568 (63)	12.62 @ 1400
2.7510	In-Tank Coupling	1-1/2 (38.1)	3000 (207)	1300	710 (80)	14.64 @ 1300
* NOTE: SS = 316SS, AS = A286, and SR = 304SS						

[1] Maximum speeds may be limited by mixing requirements and shaft vibration, including critical speed.

[2] Motor horsepower should be sized at least 25% higher than the intended application requirement.

[3] To determine horsepower at a certain speed, use the formula:

$$hp = \frac{T \times n}{63{,}025}$$

where: T= torque in inch-lbs
n= speed in rpm

[4] Purebon® is a registered Trademark of Pure Carbon Company, Inc.

[5] The magnets are stabilized at 300°F (149°C). When the temperature of the magnets exceeds the stabilizing temperature for an extended period, loss of magnetic torque will occur. Some of this loss is reversible and torque will regenerate; however, the problem is avoided by using adequate cooling to limit the magnet temperature to 300°F (149°C). A cooling jacket with two NPT connections is provided for water cooling, if necessary. Additional information on cooling requirements can be obtained in the Operation and Maintenance Manual.

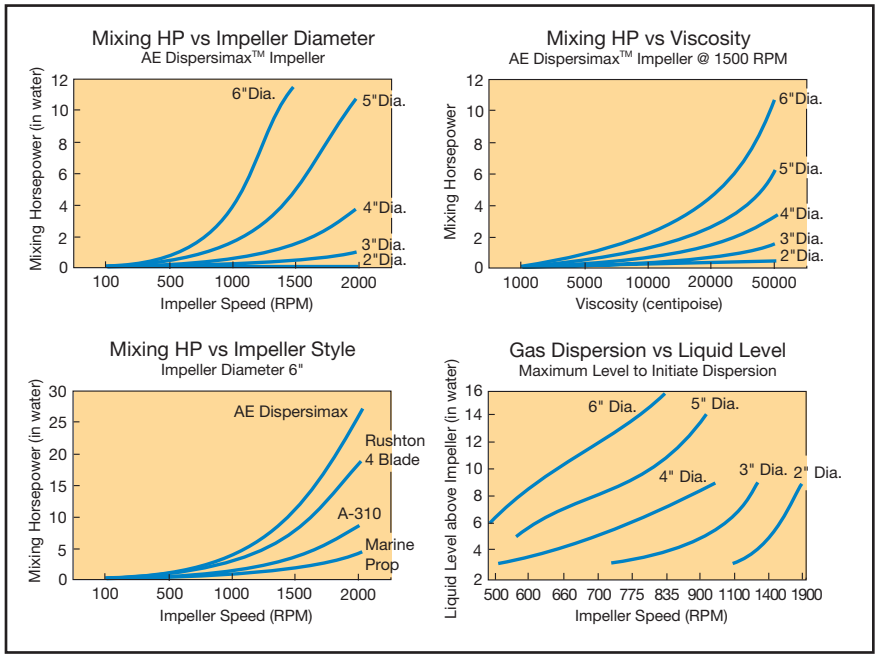
Material of Construction: 316, 304, or A-286 Stainless Steel. Optional materials include Hastelloy C-276, Hastelloy B-2, and Titanium. Please consult factory for additional materials.

- Bearing Material: Standard bearing material is Purebon® 658RCH[4]. Please consult factory for other bearing requirements.
- Maximum Temperature @ Connection: 650°F (343°C)
- Maximum Temperature @ Magnet Zone: 300°F (149°C)[5]
- Cover Connection: Threaded, collar and gland, or flanged. Refer to individual bulletins for specific MagneDrives®.
- Purge Connection: MagneDrives® are provided with gas purge connection. The iMAG075 inline does not have purge connection.
- Shaft and Impeller: MagneDrives® are supplied without shafts or impellers, allowing for the customization of the shaft length and impeller style. Parker Autoclave Engineers offers a wide selection of impellers in a variety of materials, including the Dispersimax™ Gas Dispersion System. Please consult factory for more information.

Test Reports:

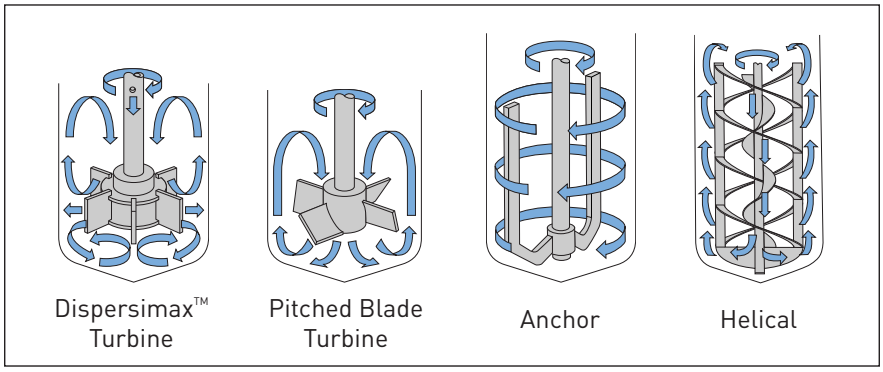
Parker Autoclave Engineers will provide computer analysis of many of the variables which impact your mixing system. These computer projections enable us to properly size and engineer an agitation system to meet your specific requirements.

Shown below are typical graphs illustrating the relationship between several critical parameters. These graphs are approximate and represent a sample of our capabilities. For a detailed evaluation of your mixing application, call your Parker Autoclave Engineers representative.



AGITATORS

Parker Autoclave Engineers offers a broad variety of agitator impeller systems which can be used in processes involving gas dispersion, liquid blending and motion, and solids suspension from low to very high viscosities with variable mixing intensity requirements. Illustrated are only four of the many standard agitators offered. For additional types, write or call for our Parker Autoclave Agitator/Mixer Bulletin.



Supporting Information:

MAG3050 Series	Bulletin AGT-MAG3050
iMAG075 Series	Bulletin AGT-MAG075 Inline
MAG075 Series	Bulletin AGT-MAG075
1.5001 Series	Bulletin AGT-1.5001MD
1.5002 Series	Bulletin AGT-1.5002MD
1.5004 - 1.5010 Series	Bulletin AGT-1.50MD
2.7504-2.7510 Series	Bulletin AGT-2.75MD
Autoclave Agitator/Mixer	Bulletin 1201
MagneDrive® Application Data Sheet	Bulletin AGT-ADSMD

Please see Page 9-10 for the MagneDrive® Application Data Sheet

Notes:

Notes:

Notes:

MagneDrive®
Application Data Sheet

DATE: _____

To allow us to select a MagneDrive® that best fits your application, please provide as much of the following information as possible.
The information that **MUST** be supplied is marked with an asterisk(*). This information can also be submitted electronically through our website.
PLEASE INCLUDE UNITS WHERE APPLICABLE.

Name*: _____ Phone*: _____

Company Name*: _____ Fax: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Country or Province*: _____ Email*: _____

Please check the items you require a quote on*: ☐ MagneDrive® [1] ☐ Shaft ☐ Impeller ☐ Motor

[1] (Does not include shaft, impeller or motor.)

APPLICATION: _____

MODEL (if known): _____

MAX. WORKING PRESSURE*: _____ MAX. WORKING TEMPERATURE*: _____

MATERIAL OF CONSTRUCTION*: 316 SS ☐ Hastelloy C276 ☐ Other _____

(**Note** - On some non-Stainless Steel MagneDrives®, material of construction of some components such as retaining rings and screws may not be available in the requested material. See bulletins for list of standard materials.)

BEARING MATERIAL: ☐ Standard Other:

O-RING SEAL MATERIAL: ☐ Standard Other:

IN-TANK COUPLING: ☐ Yes ☐ No ☐ SHAFT DIAMETER _____

MOTOR TO DRIVE CONNECTION*: ☐ In-line ☐ Belt-driven

MIXING REQUIREMENTS

MAXIMUM FLUID DENSITY*: _____ MAXIMUM VISCOSITY*: _____

ARE SOLIDS PRESENT? ☐ No ☐ Yes SIZE: _____ % SOLIDS: _____

REACTOR INSIDE DIAMETER*: _____ REACTOR INSIDE LENGTH*: _____

SHAFT LENGTH FROM TOP OF COVER*: _____ LIQUID HEIGHT ABOVE LOWEST IMPELLER: (required for dispersion)* _____

IMPELLER*:

☐ Dispersimax™ (gas dispersion)	Diameter: _____	Qty: _____	☐	☐ Fixed
☐ Straight 6-blade turbine	Diameter: _____	Qty: _____	☐ Adjustable	☐ Fixed
☐ 45 deg pitched 4-blade (up)	Diameter: _____	Qty: _____	☐ Adjustable	☐ Fixed
☐ 45 deg pitched 4-blade (down)	Diameter: _____	Qty: _____	☐ Adjustable	☐ Fixed
☐ Marine Impeller (Propeller)	Diameter: _____	Qty: _____	☐ Adjustable	☐ Fixed
☐ Helix	Diameter: _____	Number of outer flights: _____	Number of inner flights: _____	Height: _____
☐ Anchor	Diameter: _____	Height: _____	(Please include sketch of desired geometry)	

Other: _____

LOCATION OF IMPELLERS ON SHAFT (measured from shaft end)*: _____

MAXIMUM REQUIRED SPEED (RPM)*: _____ MINIMUM REQUIRED SPEED (RPM): _____

NORMAL OPERATING SPEED (RPM): _____

IS DISPERSION REQUIRED? ☐ Yes ☐ No ARE MIXING BAFFLES PRESENT: ☐ Yes ☐ No

IS A FOOT BEARING AVAILABLE OR ACCEPTABLE: ☐ Yes ☐ No

DRIVE MOTOR REQUIREMENTS

☐ **DC motor** ☐ **AC motor**

ELECTRIC MOTOR VOLTAGE REQUIREMENTS: _____

☐ General Purpose

☐ Explosion-Proof

ELECTRICAL CLASSIFICATION: CLASS _____ DIV _____ GROUP(S) _____

OTHER _____

☐ **Air motor**

AIR SUPPLY PRESSURE AND FLOW RATE AVAILABLE: _____

MOTOR MOUNTING REQUIRED (Foot mount, Face mount, etc.): _____

MOTOR / MAGNEDRIVE® CENTER TO CENTER DISTANCE: _____

MISCELLANEOUS REQUIREMENTS:

Please provide any additional information on a separate sheet.

WARNING

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06-0049FE June2015

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Caution! Parker Autoclave Engineers Valves, Fittings, and Tools are not designed to interface with common commercial instrument tubing and are designed to only connect with tubing manufactured to Parker Autoclave Engineers AES specifications. Failure to do so is unsafe and will void warranty.

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