

MASCOT™ Loadlock System

MESC COMPATIBLE

- ➔ **Load wafers or other substrates into a SEMI MESC standard process chamber without breaking vacuum**
- ➔ **Vertical lift optional — to pick up, deliver, then remove a wafer**
- ➔ **200 or 300mm chambers — custom sizes and valve interfaces**
- ➔ **Optional MESC height carts for portability and convenience**
- ➔ **Readily customized — meets a wide range of varied applications**



The MASCOT™ is a high-vacuum compatible, single-wafer loadlock designed to manually load wafers into a SEMI MESC-standard process module. Using a unique magnetically-coupled transfer arm, wafers can be repeatedly loaded and removed without breaking vacuum. The MASCOT can mimic the motions of complex and costly robots but is more convenient to use and significantly less costly.

The MASCOT consists of a chamber and a rugged Transfer Engineering Precision Magnetic Manipulator (PMM) with patented independent motion capability. The PMM performs linear motion with optional vertical lift available. See the separate Precision Magnetic Manipulator data sheet for PMM specifications.

Also available in this product line is the TEAM-Mate, a small footprint, high-vacuum compatible loadlock system. See the separate data sheet for specifications.

Vertical Lift Capability

A PMM with a dynamic end effector can pick up and deliver wafers from a MASCOT-LR loadlock chamber into a

process module independent of the mechanical motions available in the process module. The vertical motion of the dynamic end effector is orthogonal to the transfer direction. This allows the user to pick up or transfer a wafer in a process chamber that has no vertical lift capabilities. These motions mimic those of a cluster tool's robot.

A MASCOT-LO with a linear-only PMM precisely transfers a wafer into a process chamber where the receiving station (susceptor) is capable of vertical lift to remove the wafer from a transfer fork.

Clean and Precise

The MASCOT loadlock chamber is machined from a single piece of aluminum



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MASCOT 200 with Heavy Duty Cart

to guarantee the highest level of vacuum integrity and cleanliness possible—and the dynamic end effector incorporates a novel deflection spring-bearing system. This all-metal internal construction reduces total pump-down time and residual water.

The system is designed with a generous supply of auxiliary ports for greater flexibility. All seals for the load door, auxiliary ports, and pumping ports are of Viton® to ensure high-quality vacuum performance. There are two sizes of the standard MASCOT chambers — one to handle wafers/substrates up to 200mm and another for 300mm.

Chambers of custom size and shape are available.

Applications

The Transfer Engineering MASCOT load-lock system is ideal for several applications where direct access to a single process module is required or desired.

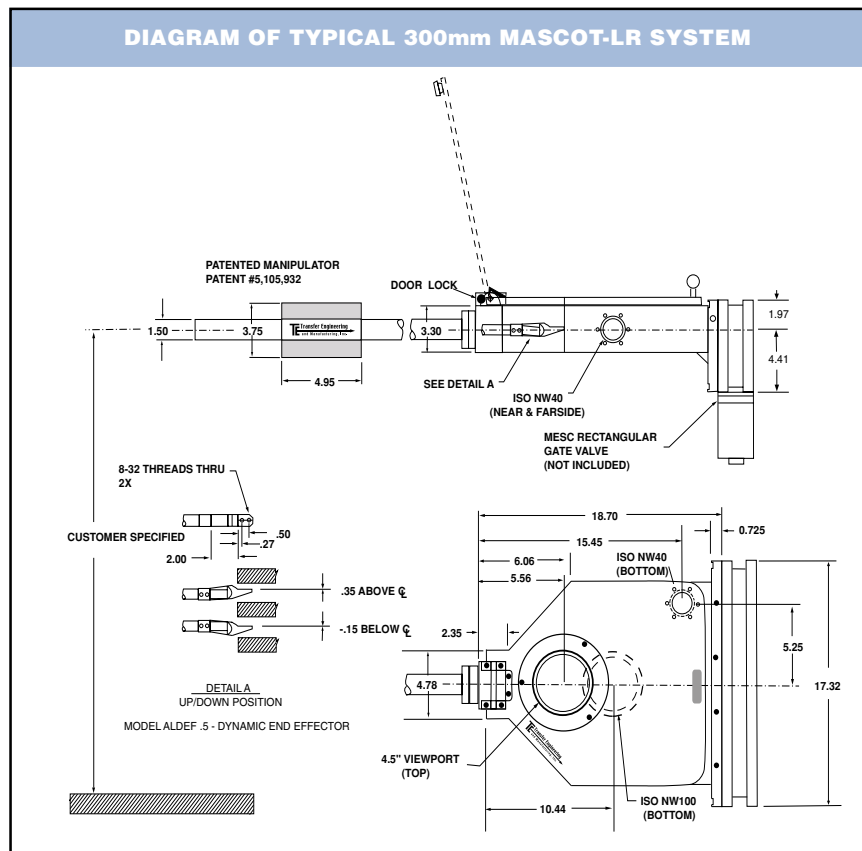
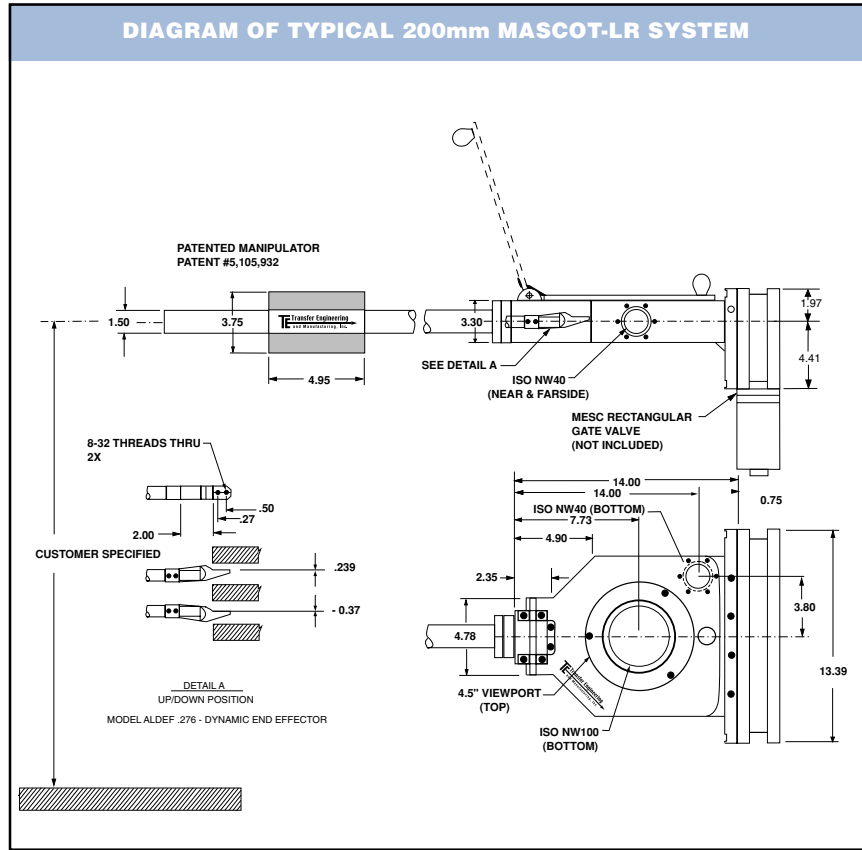
In research and development applications, it provides product and process engineers and scientists a single wafer sample delivery system with motions that mimic those of a central robot.

As a cost-effective manufacturing tool, the loadlock system can be used to test individual process modules prior to assembling them to a central robot. It also allows a cluster tool module to be tested prior to their installation back on the cluster tool following repair or routine maintenance.

In an R&D or university community, a single process module designed for a cluster tool can be turned into a low-volume standalone system.

Finally, it is an excellent support tool during process modification because it can access specific modules for testing without compromising the module's vacuum pressure.

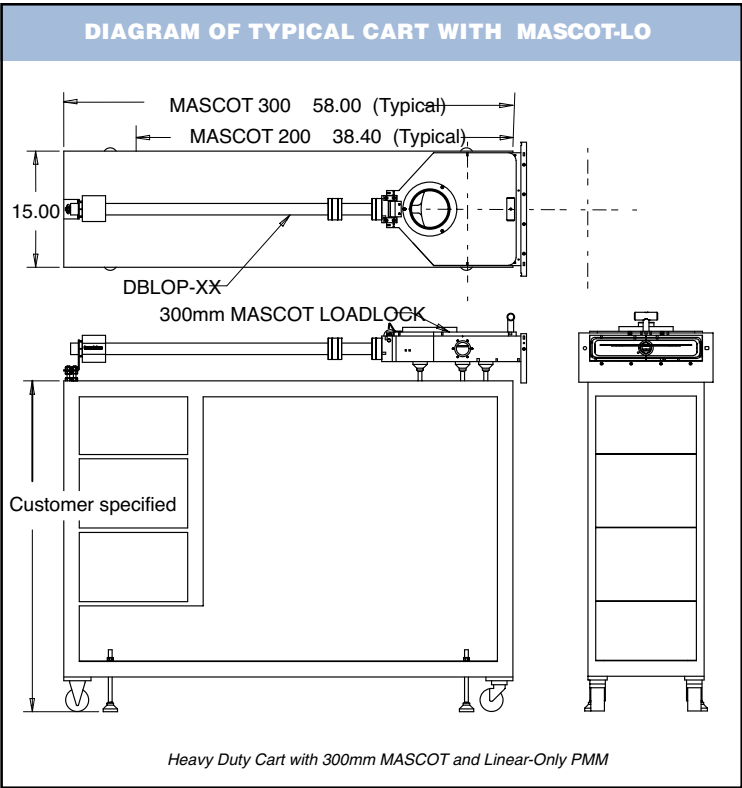
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SPECIFICATIONS AND DESCRIPTION		
MASCOT MODEL	MASCOT 200	MASCOT 300
Material		
→ Chamber	Single machined aluminum block H-V compatible - Metal with Viton o-rings	Single machined aluminum block H-V compatible - Metal with Viton o-rings
→ Precision Magnetic Manipulator	All UHV compatible See separate PMM data sheet	All UHV compatible See separate PMM data sheet
Description		
Chamber		
→ Wafer sizes	Up to 200 mm	Up to 300 mm
→ Exterior dimension	14" x 11.5" x 4"	18.70" x 14.75" x 4"
→ Load door with window	10" load door	14.75" load door
→ Fits MESC-standard valves and chambers	SEMI E21-91	SEMI E21
→ Volume of chamber with typical PMM installed	3.89 Liters	7.51 Liters
→ Pump port	ISO NW100 (4" ID)	ISO NW100 (4" ID)
→ Auxiliary ports	Three ISO NW40 (1.57" ID)	Three ISO NW40 (1.57" ID)
System		
→ Transfer distance	Up to 60"	Up to 60"
→ Dynamic End Effector vertical travel	Standard = 0.276" total	Standard = 0.5" total
→ Weight	~45 pounds (includes PMM)	~60 pounds (includes PMM)
		<i>Specifications subject to change without notice.</i>

Model MAHDS, Heavy Duty Cart

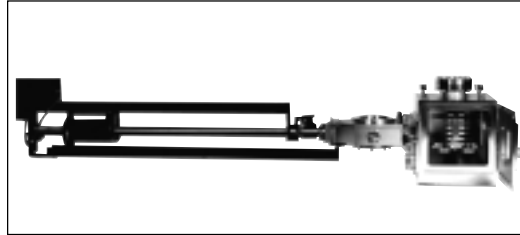
A Model MAHDS, Heavy Duty Cart, allows portability of a MASCOT Loadlock System. This frame assembly has casters, leveling pads and is equipped with shelves to conveniently move the loadlock, pumps and gauges from one process chamber to another. The standard MAHDS is shown. However, heights and shapes are easily customizable to fit specific applications.



Custom Features and Accessories

The MASCOT Loadlock systems can be customized to meet a wide range of specific needs. Following are some of the features that can be modified along with a few examples of customized features or systems.

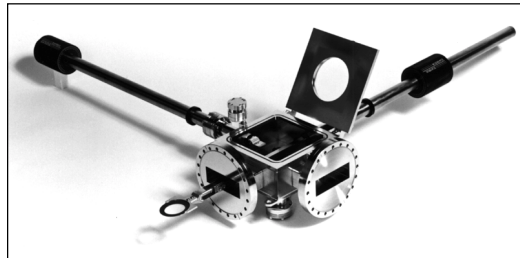
Multiple chambers



Cassette elevator systems

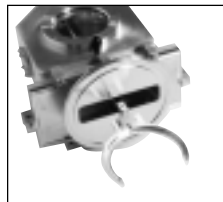
Computer control

All stainless steel construction



Dual directional manipulators

Custom end effectors and wafer/sample holders



Can be adapted to fit special flanges

Custom chamber sizes, shapes and valve interfaces available



Switches for door closure and/or manipulator location

Lexgard door for full sample viewing

MESC height carts for portability and convenience



About Transfer Engineering & Mfg, Inc.

Transfer Engineering and Manufacturing provides innovative products for OEM, Production Facility and R&D/University Lab customers in the Semiconductor, Media, Sputter Deposition and R&D markets. TEAMS core expertise is in the handling, transporting, positioning, and manipulation of samples, semiconductor wafers, substrates, flat panels, and other materials with precision and reliability in HV, UHV, ultra-clean and other challenging controlled environments.

Product lines include —

- ➔ Linear, Rotary and Linear/Rotary Precision Magnetic Manipulators
- ➔ Sample transfer & loadlock systems including the MASCOT MESC-compatible wafer transport system
- ➔ HV and UHV heating and/or cooling assemblies
- ➔ Motion and placement systems
- ➔ Automated loadlock systems
- ➔ Custom systems

At Transfer Engineering we believe the key to providing the best product solution is to work closely with customers to understand their process and objectives and to involve them in the product design to ensure that goals are met. Contact us for technical information or a quotation.

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