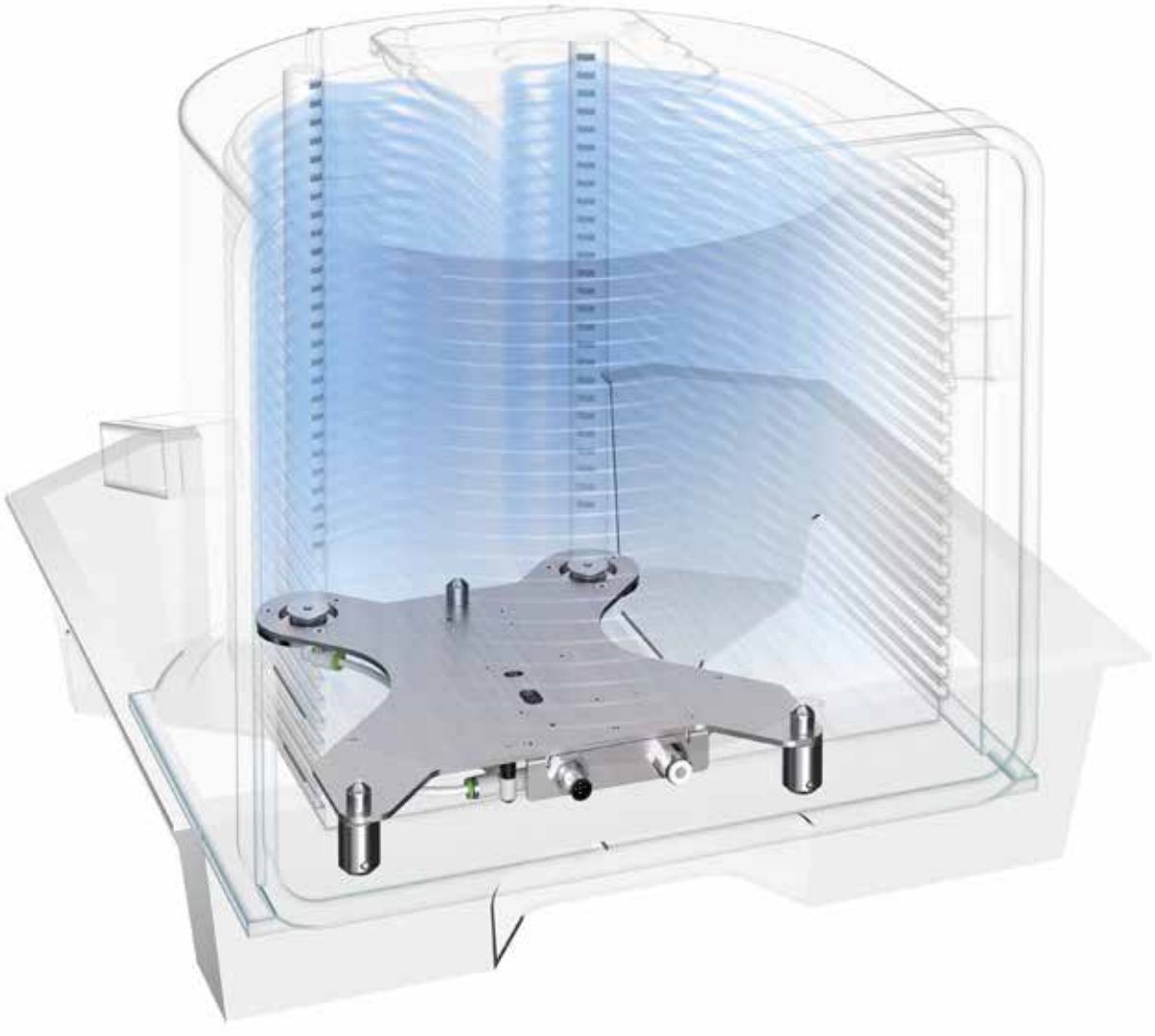
STORAGE

FABMATICS
Automate your success

FOUP PURGE SYSTEM

Retrofittable inert gas purge system for FOUP storage bins



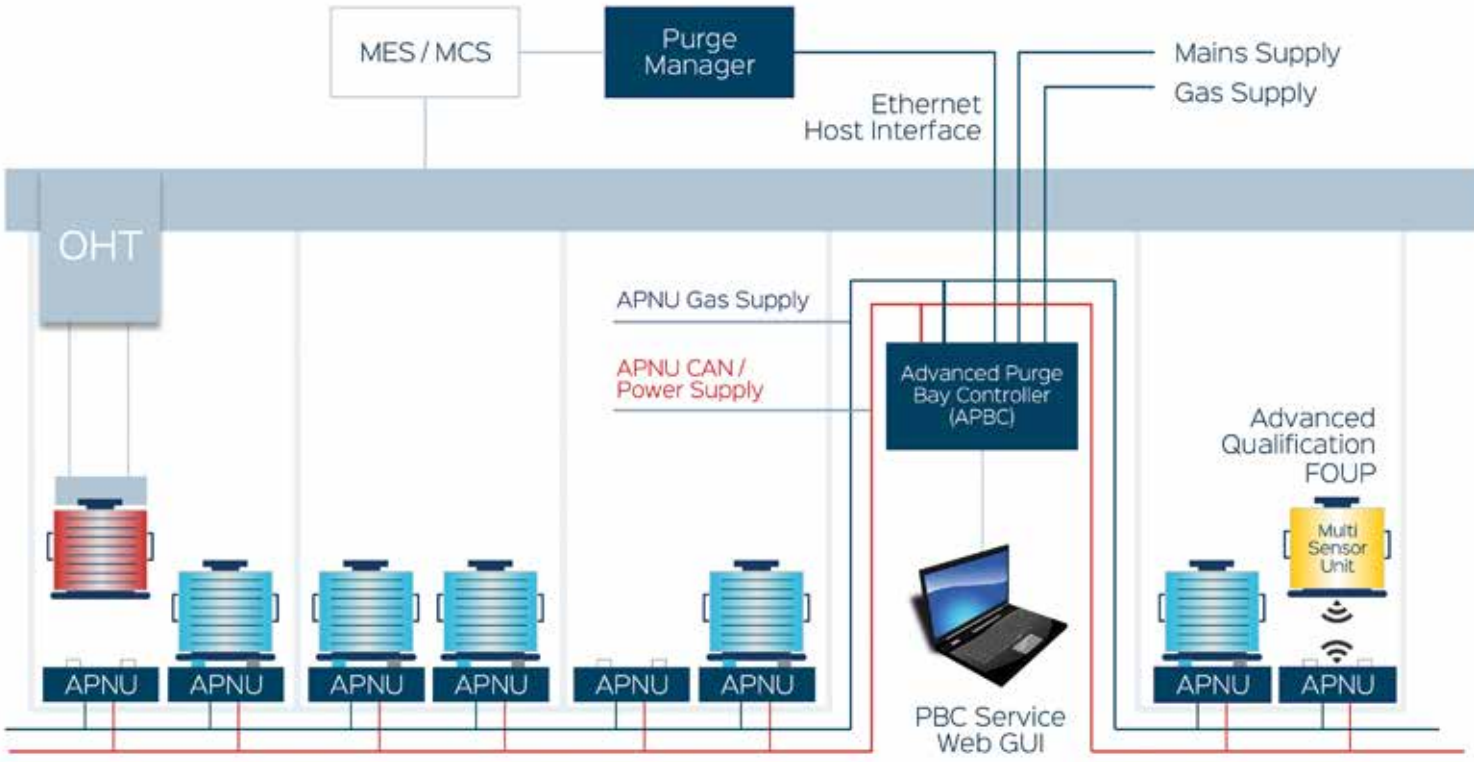
FOUP PURGE SYSTEM

Retrofittable inert gas purge system for FOUP storage bins

Semiconductor industry leading edge companies are developing and producing at process nodes of 28 nm & below. These smaller structures require a contamination and oxidation-free environment during production in order to exclude harmful influences like humiditiy, ambient oxygen or emission of molecules (airborne molecular contamination). These process related interactions may lead to surface defects and yield loss.

Especially while wafers stored in FOUPs are waiting for the next process step, the danger of these unwanted side reactions is very high. Our purge system **avoids oxidation & other chemical reactions** by purging the FOUP with an inert gas during interim storage between two process steps. The system can be **easily retrofitted to existing storage bins** (e.g. Zero Foot print Storage) in cleanrooms. The advantage in this case versus the exclusive use of purgeable loadports, which can only flush the FOUP with gas during docked on process tools, is the **continuing supply of an inert gas** like nitrogen at any conceivable storage location by using an economical flowrate. This is triggered as soon as the FOUP is positioned, and ends once it will be removed from the purge nest unit again. This reliably protects the wafers during the entire storage period.

General system design



Application example for Zero Footprint Storage

The purge system consists of three main components:

- Advanced Purge Nest Unit (APNU)
- Advanced Purge Bay Controller (APBC)
- Purge Manager software

Every Zero Footprint Storage bin can be retrofitted with an Advanced Purge Nest Unit (APNU) which is used to accommodate the purge inlet interfaces. They directly communicate via a combined CAN power bus wire with the Advanced Purge Bay Controller (APBC). The APBC controls all connected APNU modules and represents a communication gateway to the Purge Manager software. Each Purge Bay Controller has its own IP address for individual access with a Service GUI via a standard web browser and optional via HSMS.

Features

Easy to retrofit
- May be retrofitted on existing systems for FOUP storage (e.g. ZFS, stocker) without having to change the fab structure
- Installation during regular operations possible

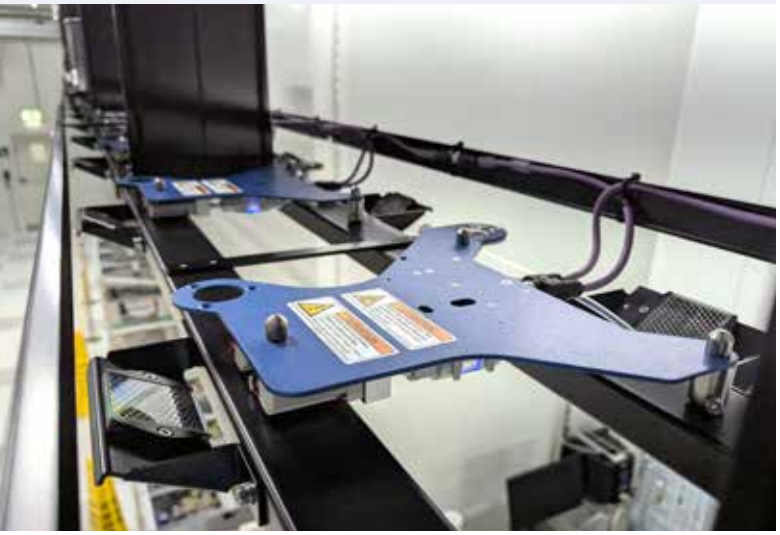
Flexible installation
- APNU modules can be installed wherever necessary, in rows, isles or in a matrix
- Quick servicing possible

No additional footprint needed
- Purge nests are integrated into existing storage bins
- Slim, light & functional design

High purity operation
- Advanced purge interface design provides maximum pureness and durability
- Each APNU features its own particle filter

Intelligent software
- Every purge nest is individually monitored and controlled
- Sensors in the nest monitor the gas flow via back pressure and report errors
- Independent purge functionality for each nest, no gas spill / waste
- Interval purge functionality can be set up via purge profiles
- Service GUI via web interface
- Continuous quality monitoring in combination with Advanced Qualification FOUP (optional)
- Lean and flexible control system based on embedded Linux
- HSMS interface based on SEMI E88 (optional)

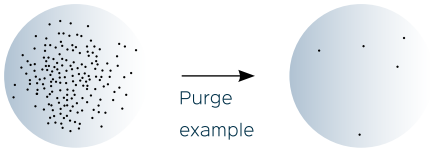
General characteristics
- Silent noise free purge operation in any condition



N2 Purge application integration example for over-head buffers (OHB).
Solutions for Stocker Purge can be provided upon request.
More than 18,000 FOUP purge units already in operation.

Benefits

- Avoids AMC (Airborne Molecular Contamination) and other chemical reactions



- Allows extended queue time between process steps

- Improves overall process yield
- Minimized cost of ownership by optimized long term durability of all components

Technical data

Advanced Purge Nest Unit (APNU)	
Placement sensor	Optical LiDAR-TOF
Flow rate	Pre-adjustable between 0.1 and 40 slpm per step
Supported FOUP types	Entegris Spectra, SEP 300EX, others upon request
Flow control options	1 step , 2/3 step (depend. on configuration)
Pressure sensor	Software defined switch points detect multiple back-pressure ranges (e.g. low, good, high)
Weight	1 kg / 2.2 lb
Material (baseplate)	Anodized aluminium
Features	Multi LED status display, Qualification FOUP IR data link

Advanced Purge Bay Controller (APBC)	
Amount of connectable APNUs	50 regular, with simultaneous flow rates up to 10 slpm
Communication uplink	Web GUI and HSMS (optional) via Ethernet
Operation system	Embedded Linux
Weight	12 kg / 26.5 lb
Material (case)	Sheet steel
Features	Web GUI provides overall pressure, flow and utilization monitoring

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