FED HPTF Getter

HIGHLIGHTS

General Features

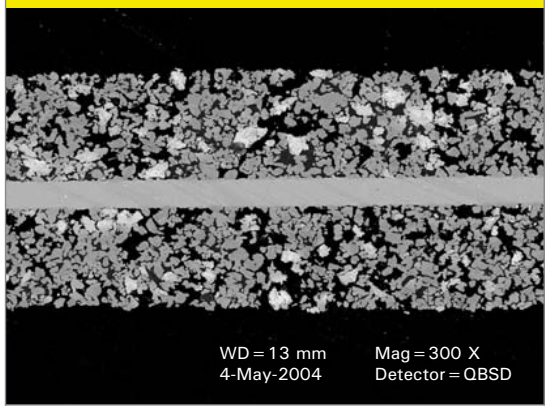
- ☐ The highest sorption capacity in a wide range of product thicknesses
- ☐ Custom product geometry, addressing any FED design requirement
- ☐ High air frit-sealing resistance and easy activation during baking
- ☐ Ease-of-handling, due to the specific packaging configuration

New, cutting-edge flat panel display technologies impose increasingly severe constraints on manufacturers of getters used to sorb harmful gases inside the devices: they need to be small and extremely effective, as well as capable of delivering long-term sorption under harsh processing and operating conditions. The SAES® Getters Group answers this challenge in Field Emission Display manufacturing by delivering FED HPTF Getter, an advanced gettering system deposited using SAES Getters' patented technology.

Flexible Manufacture

HPTF getters were developed for flexible manufacture: getters may be produced with single or double-sided coatings. Leading-edge technologies such as Field Emission Displays need getters that are designed to fit the constraints of the most stringent device geometries: our FED HPTF Getters can be fully custom-tailored in size and shape, to fit any requirement of these displays.

SEM Cross-section of FED HPTF Getter



Composition and Physical Properties

HPTF getters are composed of a Nichrofer substrate coated with St 122, SAES' alloy of titanium and St 707 (SAES Getters' best-known alloy composed of Zr, V and Fe). Our patented manufacturing process for HPTF involves screen printing and sintering of the getter material onto the substrate, resulting in a high-porosity, low-particulating, mechanically strong getter structure.

Emissivity	0.60 to 0.65 (depending on getter's level of oxidation)
Density of bulk St 122	about 4.7 g/cm^3
Apparent density (in HPTF)	2.0 +/- 0.3 g/cm^3 (due to porosity of 55% to 65%)
Mass of getter material	about 20 mg/cm^2 for 100 µm thick getter layer

Product Performance

The FED application presents an extremely challenging environment for getters and SAES' HPTF getters have been fully optimized to meet the processing and operating key-issues of the FED technology.

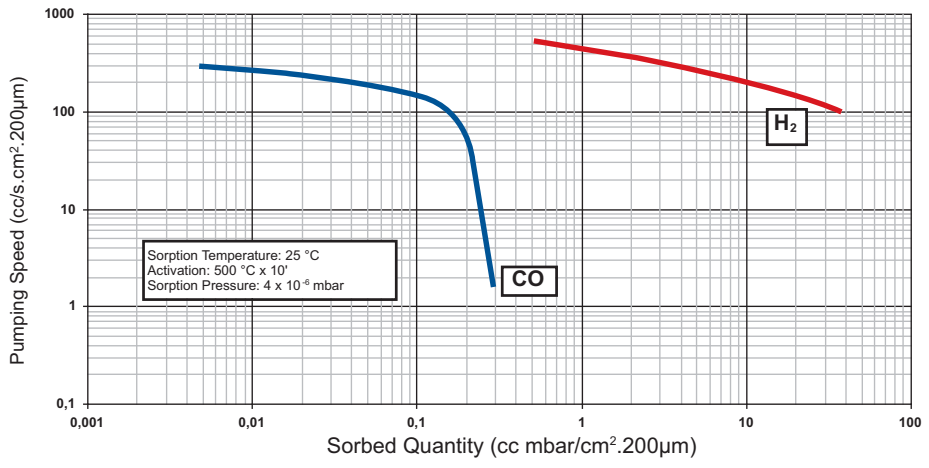
we support your innovation

saes getters

FED HPTF Getter

Typically, the getter is sealed into the display package during the frit-sealing process, either in a vacuum process or in air. When the frit-seal is done in vacuum, the getter is activated during that process. Remarkably, our FED HPTF getters can withstand an air frit-seal process and still retain an adequate sorption capacity.
The quantity of getter required for a specific FED is dependent on the outgassing of the materials in the display from the time that the getter is active.
Typically, getter sorption performances are evaluated following the ASTM F 798-82 procedure.

Sorption performance at 4·10^{-6} mbar CO partial pressure for a 200 micron thick HPTF getter.



Tests performed in SAES Getters Research & Innovation labs with getters placed into dummy display panels, in co-operation with the world-renowned FED development center CEA-LETI and the industry-leading Saint Gobain Display Glass, confirm that our FED HPTF getters are able to reliably withstand the frit-sealing process and be efficiently activated during the baking & exhaust at lower temperature.
After the completion of the processing, the residual pressure in the displays is in fact measured in the 10^{-5} mbar range and found to be composed of non-getterable gases.
The remaining getter sorption capacity is essentially that of a fresh getter (about 0.7 cc·mbar/cm^2 at 10^{-3} mbar), demonstrating an effective activation.

Full Support for FED Manufacturers

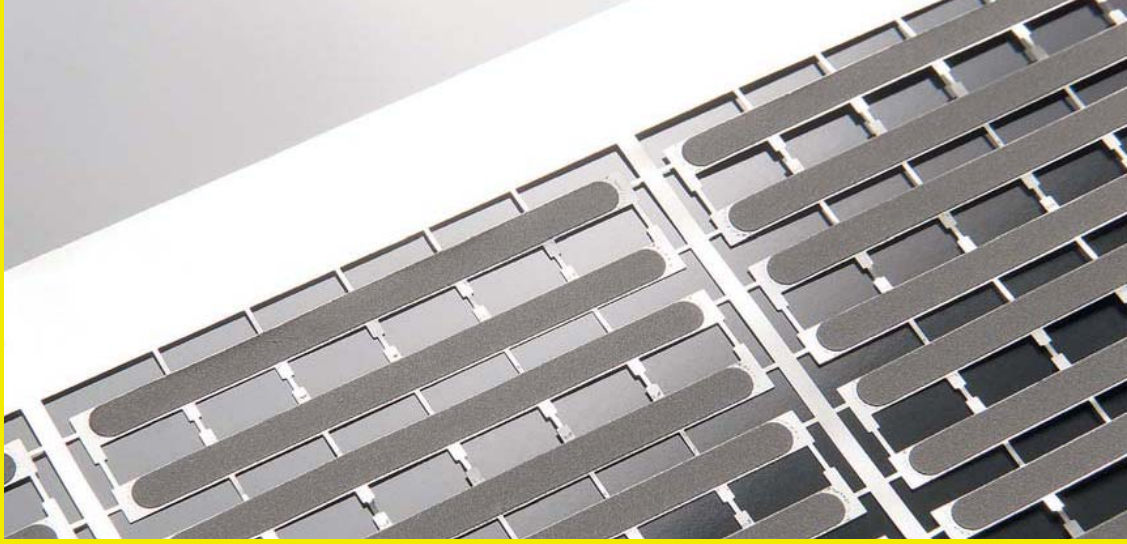
HPTF getters offer FED manufacturers the flexibility needed in this cutting-edge application. Our getters can fit into extremely constrained display locations, because they can be made in an infinite variety of geometries.
In addition to shape customization, FED HPTF getters are available in a wide range of thicknesses.
If needed, the getter substrate can carry up to 400 µm of alloy to handle the highest gas loads.
HPTF getters for FEDs are available in single pieces, A4 sheets, and in high-volume special cartridge configurations.
As an integration to its getter product line and to completely support the FED industry, SAES Getters offers mathematical modeling and state-of-the-art analysis, which assure that material selection, processing and adopted getters are fully optimized for ultimate display success.

The SAES Getters Group manufacturing companies are ISO9001 certified, the Asian and Italian companies are also ISO14001 certified.
Full information about our certifications for each company of the Group is available on our website at: www.saesgetters.com

D.FP.64.1

SAES Getters Group
www.saesgetters.com
flat_panels@saes-group.com

Plasma HPTF Getter



HIGHLIGHTS

General Features

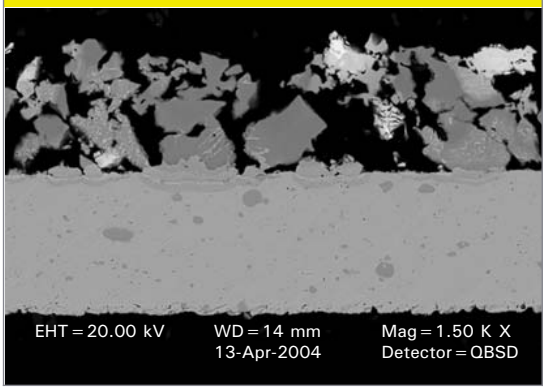
- ☐ The highest sorption capacity in the thinnest product configuration (< 110 µm)
- ☐ Custom product geometry, addressing any PDP design requirement
- ☐ High air frit-sealing resistance and easy activation during baking
- ☐ Ease-of-handling, due to the specific packaging configuration

Newest flat panel display technologies impose increasingly severe constraints on manufacturers of getters used to sorb harmful gases inside the devices: they need to be small and extremely effective, as well as capable of delivering long-term sorption under harsh processing and operating conditions.
The SAES® Getters Group answers this challenge in plasma display manufacturing by delivering Plasma HPTF Getter, an advanced gettering system deposited using SAES Getters' patented technology.

Flexible Manufacture

HPTF getters were developed for flexible manufacture: getters may be produced with single or double-sided coatings.
Leading-edge technologies such as Plasma Display Panels (PDP) need getters that are specifically designed to fit the constraints of the most stringent device geometries, which HPTF getters' size & shape flexibility fully addresses.

SEM Cross-section of Plasma HPTF Getter



Composition and Physical Properties

HPTF getters are composed of a Nichrofer substrate coated with St 122, SAES' alloy of titanium and St 707 (SAES Getters' best-known alloy composed of Zr, V and Fe). Our patented manufacturing process for HPTF involves screen printing and sintering of the getter material onto the substrate, resulting in a high-porosity, low-particulating, mechanically strong getter structure.

Emissivity	0.60 to 0.65 (depending on getter's level of oxidation)
Density of bulk St 122	about 4.7 g/cm^3
Apparent density (in HPTF)	2.0 +/- 0.3 g/cm^3 (due to porosity of 55% to 65%)
Mass of getter material	about 20 mg/cm^2 for 100 µm thick getter layer

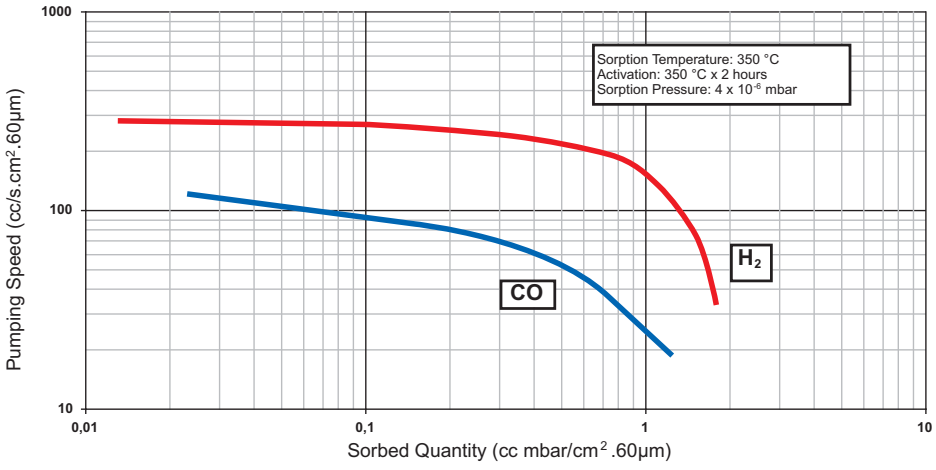
Product Performance

Plasma displays operate at around half an atmosphere pressure, not at high vacuum, so why use getters in PDPs? Enhanced manufacturing efficiency and extension of device lifetime: Plasma HPTF Getter, used in a PDP as an in-situ pump, dramatically shortens process time and lowers gaseous impurities in the display.

The getter continues to remove contaminants throughout the entire operational display life, thus maintaining the state-of-the-art performance of the PDP.

Tests performed in SAES Getters Research & Innovation labs, with getters placed into dummy display panels, confirmed that Plasma HPTF Getter is able to reliably withstand the frit-sealing process.
During the bake subsequent to the frit-sealing process, the getter is activated, achieving pumping characteristics nearly equal to that of a fresh HPTF.

Sorption performance at 4·10^{-6} mbar CO and H_2 for the 60 micron thick getter layer, extracted from dummy panels after air frit-sealing



The quantity of getter required for a specific PDP is dependent on the outgassing of the materials in the display from the time that the getter is active.

Full Support for PDP Manufacturers

Plasma HPTF Getter offers PDP manufacturers the flexibility needed in this application, since its geometric flexibility helps solve the severe restrictions of extremely constrained spaces.
In addition, the Plasma HPTF Getter can now be easily integrated into the primary channel of the PDP thanks to its unprecedented 110 µm thickness, yet delivering superior pumping performance.

HPTF getters for PDPs are available in single pieces, A4 sheets, and in high-volume special cartridge configurations.

SAES' PDP gettering solutions are completed by the offer of in-house resources for mathematical modeling and state-of-the-art analysis, which assure that material selection, processing and getter technology are fully optimized for ultimate display success.

Plasma HPTF Getter

The SAES Getters Group manufacturing companies are ISO9001 certified, the Asian and Italian companies are also ISO14001 certified.
Full information about our certifications for each company of the Group is available on our website at: www.saesgetters.com

D.FP.65.1

saes getters

SAES Getters Group
www.saesgetters.com
flat_panels@saes-group.com