

ST122 SP Getter

A new generation of high performance, high porosity thick film getters

A new era of applications calls for a new era of gettering technology. Flat panel displays, MEMs, and miniature vacuum systems of all kinds need small, effective, and clean gettering systems. St 122 SP is a high porosity, thick film getter structure that can be deposited utilizing SAES Getters' patented SP technology. This technology allows an infinity of configurations on many different substrates to meet the stringent needs of these applications.

Flexible Manufacture

A key goal in the development of St 122 SP was flexible manufacture, strips may be produced as either single or double coated. The days of a "one size fits all" getter are over. Leading edge technologies such as flat panel displays need getters that are designed to fit in constrained volumes - volumes that are different from product to product, even within an area of technology. In order to meet the needs of customers for custom configurations thick film screen printing processes are used. This permits a customer to design the layout of the getter to meet their needs with fast turn around times for custom configurations.

Possible substrate materials include nichrome, nickel, titanium, nickel, moly, stainless steel, and zirconium.

Composition

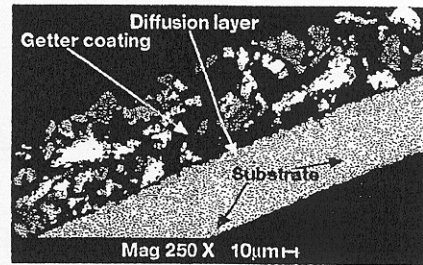
St 122 is a mixture of Ti-St 707. SAES Getters' St 707 is a ternary Zr-V-Fe alloy. A proprietary process involves screen printing and sintering of the getter material resulting in a high-porosity, low-particulating and mechanically strong structure of St 122.

Applications

FEDs	<p>The FED application presents a most challenging environment for getters. St 122 SP has been optimized for this application.</p> <p>Typically, the getter is sealed into the package in a vacuum process. The cathode and anode structures are held apart to allow for outgassed species to be removed by the process pump.</p> <p>The getter is activated during the sealing process. Typical frit-seal times and temperatures, in the range of 400°C to 430°C for about a half hour or more, are sufficient to fully activate the getter.</p> <p>The quantity of getter required is dependent on the outgassing of the materials in the display, as well as the processing of those materials.</p>
MEMS	<p>Successful application of St 122 SP in MEMS applications requires a good activation of the getter to maximize use of the available active mass. Typical processes would consist of prebaking the package before die attach in order to reduce the amount of hydrogen present that could outgas. This hydrogen is entrained in the electroless gold metallization common to standard packages. Such bakeouts can be performed for one hour at 500°C at a pressure of 10⁻⁵ to 10⁻⁶ torr.</p> <p>When the package is ready for final sealing the getter should be activated first in order to gain maximum performance before sealing. SAES has worked with equipment vendors to develop a turnkey sealing and activation process.</p>
Other	<p>St 122 SP can be used anywhere a thin, high efficient getter is required.</p>

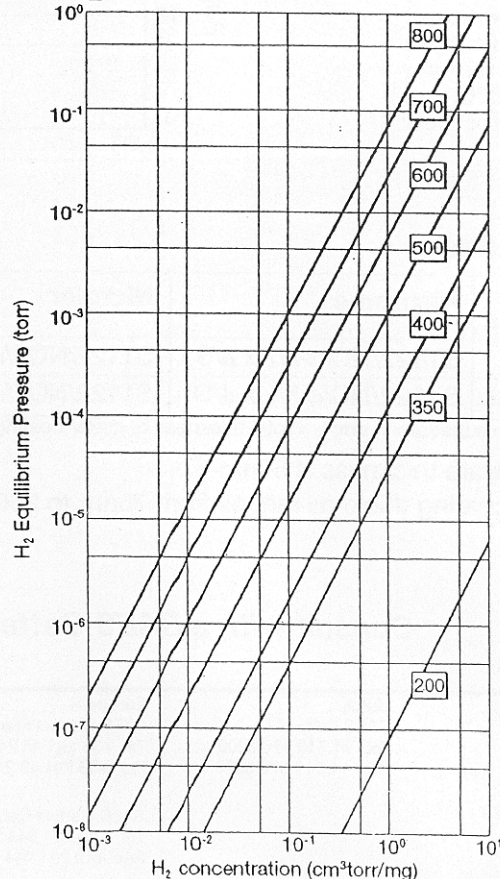
Physical Properties

Emissivity	ranges from 0.60 to 0.65 (depending on the surface contamination and oxidation of the getter)
Density	about 4.7 g/cm ³
Apparent Density (in HPTF configuration)	2.0 +/- 0.3 g/cm ³ (due to the high porosity ranging from 55% to 65%)
Mass of getter material	20mg per cm ² for a 100µm thick layer
Thermal properties	table data are not available and empirical measurements are extremely difficult with porous structures



Cross Section of ST122SP

ST122 H₂ Equilibrium Pressure Curves



INNOVATION...

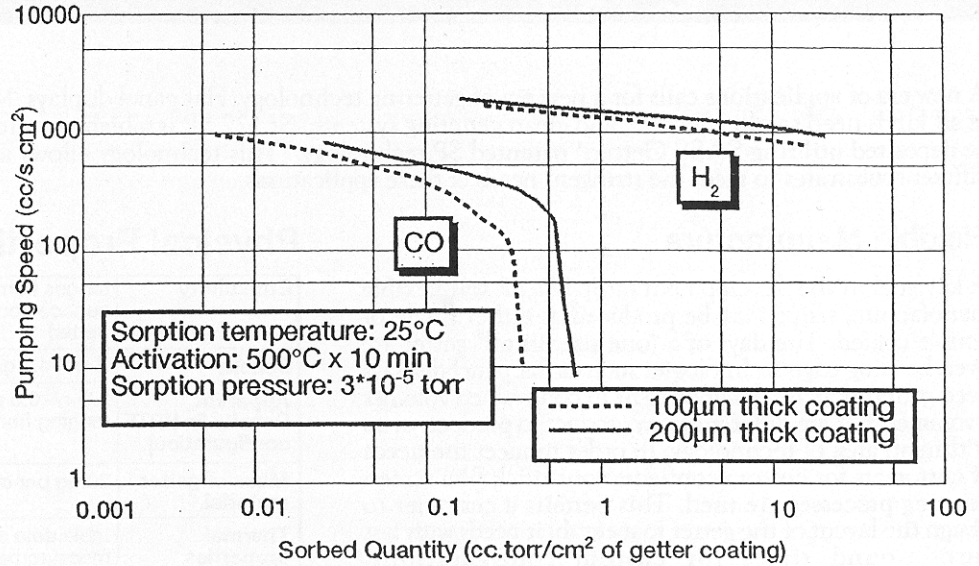
saes
getters

Electronic Devices and
Flat Panel Displays

Performance Properties

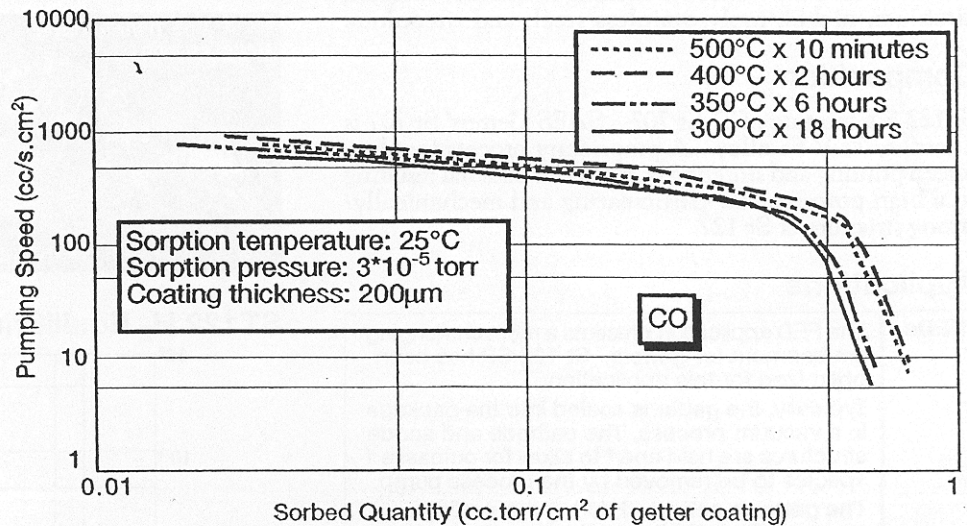
Sorption Capacities

St 122 SP is optimized to give the maximum pumping performance per unit area. The thickness of the film can be varied to optimize the characteristics of the film. The getter material can be maximized so that double thickness results in double sorption capacity. When sizing a St 122 SP getter consult with your SAES Getters engineer as many variables must be considered for the best results.



Activation

The getter activation process consists of supplying enough heat energy for the protective passivation layer on each grain of getter material to diffuse into the bulk, thereby exposing chemically active getter alloy. This diffusion process is a function of time and temperature. Typically, activation conditions of 10 minutes at 450° to 500°C are recommended for best results.



Product Codes

Substrate / Configuration	Nichrome	Nicrofer	Titanium	Nickel
Single-sided	ST122/NC/a-b/c x d/S	ST122/NCF/a-b/c x d/S	ST122/Ti/a-b/c x d/S	ST122/Ni/a-b/c x d/S
Double-sided	ST122/NC/a-b/c x d/D	ST122/NCF/a-b/c x d/D	ST122/Ti/a-b/c x d/D	ST122/Ni/a-b/c x d/D

a = thickness of the substrate in µm; b = total thickness of getter coating deposited in µm; d = length of the piece in mm; c = width of the piece in mm

Standard substrate thickness is 50µm

Typical getter coating thickness ranges from 75µm to 250µm

Consult with a SAES Getters Engineer for further details

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