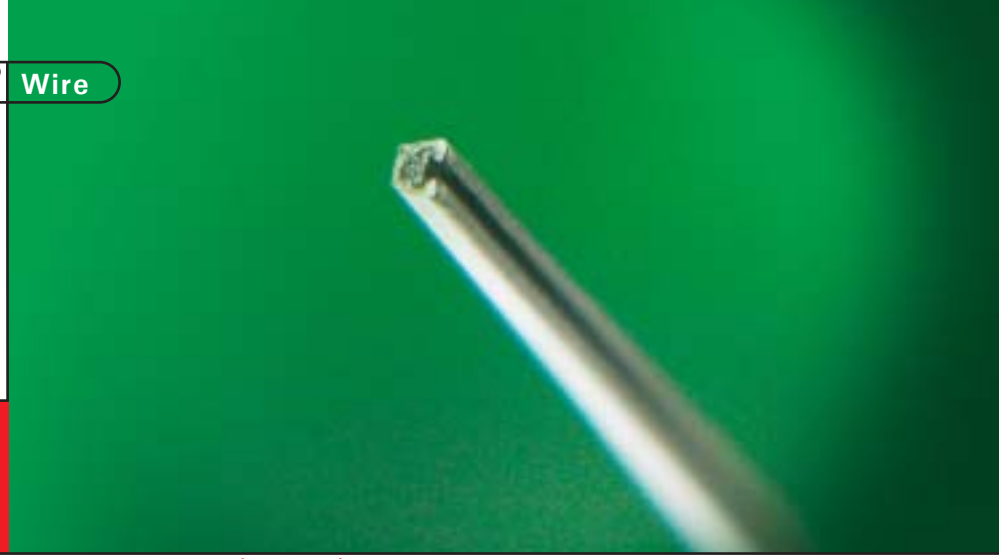
Stahgsorb® Wire



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HIGHLIGHTS

General Features

- ☐ Totally controlled, precise and safe mercury dispensing
- ☐ Optimized mercury yield
- ☐ 100% compliant with double tip-off technology
- ☐ Improved lamp performance and lifetime through the getter component action
- ☐ Reduced environmental impact of products and processes
- ☐ Easy integration into lamp manufacturing lines

Applications

- ☐ Cold cathode fluorescent lamps
- ☐ External electrode fluorescent lamps

Cold Cathode Fluorescent Lamps (CCFL) are adopted for backlighting of LCD displays used in several devices, such as laptop computers, desktop monitors and flat television sets. CCFLs and other small fluorescent lamps typically need 1-3 mg of mercury for operating. The growth of the flat display market, as well as the increase of ecological sensitivity and the issueing of local environmental policies, progressively pushed lamp manufacturers to further and further reduce the absolute value of mercury dose and its fluctuations. The SAES® Getters Group actively supported this requirement through the development of a novel technology capable to deliver very accurate mercury dispensing, ensuring meanwhile the highest gas purity inside CCFLs.
SAES Stahgsorb® Wire is especially suited to meet the requirements of lamp manufacturing processes, particularly the state-of-the-art double tip-off technology, since it allows:

- ☐ Extremely precise and reproducible mercury dosing
- ☐ Easy insertion into very thin glass tubes
- ☐ Withstanding of baking-exhaust process (usually up to 500 °C for few minutes) without premature release of mercury
- ☐ Efficient sorption of gas impurities, immediately after mercury release

SAES' Stahgsorb Wire is the most widely adopted Hg dispensing solution for the production of cold cathode fluorescent lamps worldwide.
Very reliable and precise Hg dosing is a primary advantage delivered by Stahgsorb Wire: mercury content fluctuation is less than ±7%, allowing the smallest possible nominal dose to assure optimum lamp brightness and lifetime. SAES Getters' optimized manufacturing technology and quality control enable us to guarantee the highest quality standard for Stahgsorb Wire, both in terms of mechanical reliability and consistent mercury content.

Stahgsorb Wire consists of a nickel-plated iron sheath shaped with a trapezoidal cross section and filled with a mixture of St 505 titanium-mercury alloy for Hg dispensing and of St 101®, a zirconium-aluminum non-evaporable getter alloy. Both alloys were originally developed by SAES Getters. The presence of St 101 getter alloy improves the average lamp quality and performance, by absorbing any gas impurity, especially hydrogen, which might be present in the lamp fill gas or be released by hot surfaces during the production process.

Product description	Length (mm)	Nominal dimensions (mm) A	B	Nominal Hg content (mg/mm)
STHGS/WIRE/NI/0.6-300	300	0.75	0.6	0.46
STHGS/WIRE/NI/0.8-300	300	1.0	0.85	0.78
STHGS/WIRE/NI/0.8-500	500	1.0	0.85	0.78

Stahgsorb Wire is supplied in 300 and 500 mm-long pieces, which are then cut to the adequate length to give the desired amount of Hg release: a product packaging formula that assures the maximum flexibility of the mercury dose size.

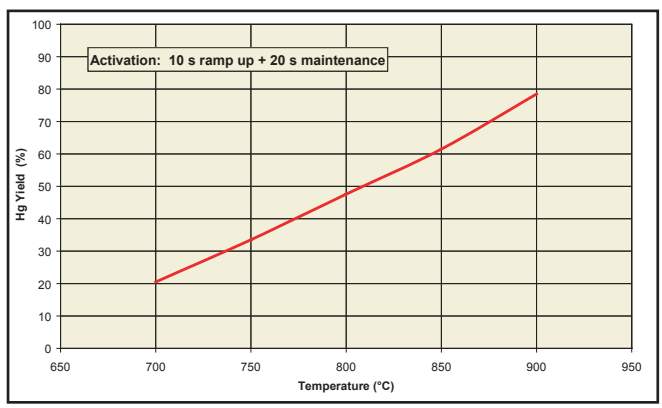
Product Activation

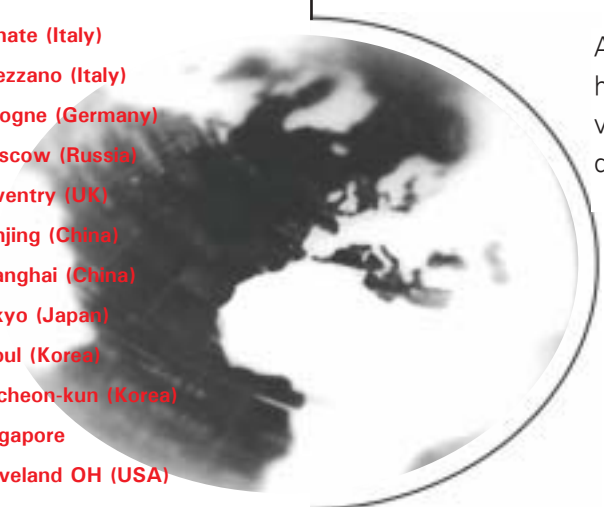
SAES Stahgsorb Wire must undergo an activation process to release Hg and to start the chemical sorption of impurities through its gettering action. Activation is performed as last step of the manufacturing process, after having filled the lamp tubulation with inert gas at low pressure and having isolated it from the exhaust system (usually by tip-off operation). It consists in heating the dispenser to a suitable temperature for a prescribed time. This is usually achieved using a radio frequency field to induce eddy currents in the dispenser.

A typical activation process required in order to release about 80% of total Hg content is 900 °C with a total heating time of 30 seconds.

Time-temperature profiles allowing to achieve optimized mercury yield may vary with respect to the specific constraints of the lamp manufacturing process and the necessary Hg dose.

The chart shows the Hg yield curve characteristic of the product model STHGS/WIRE/NI/0.8-300 for a total heating time of 30 seconds (10 seconds temperature ramp plus 20 seconds at maximum temperature).





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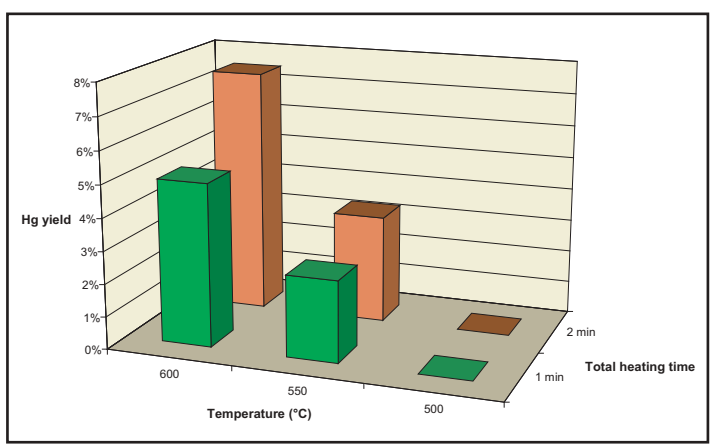
As shown in the chart below, no mercury release is measured after heating a piece of STHGS/WIRE/NI/0.8-300 at 500 °C for two minutes in vacuum. Normally the dispenser has to withstand similar conditions during lamp manufacturing, before activation.



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SAES Getters S.p.A.
Group Headquarters
Viale Italia 77
20020 Lainate (Milan), Italy
Tel.: + 39 02 931 78 1
Fax: + 39 02 931 78 320

For worldwide Sales & Service locations check
www.saesgetters.com

info at: **lcd_lamps@saes-group.com**

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