

# TQS® and Roof



## HIGHLIGHTS

### General Features

- Total mercury yield
- Totally controlled, precise and safe mercury dispensing
- Reduced environmental impact of products and processes
- Improved lamp performance and lifetime through the getter component action
- Easy integration into standard and high-speed manufacturing lines

### Applications

T8LFL - T10LFL - T12LFL for TQS  
T5LFL - T8FL - CFL for Roof

- Three-band phosphor lamps
- Halo-phosphor lamps

## A Revolutionary Technology

SAES® Total Quality Shield - TQS® and SAES Roof are the most advanced technological solutions for precise, reliable and safe mercury dispensing in Linear Fluorescent Lamps. These products have been developed at SAES Getters Group in close co-operation with customers to fully comply with the real needs of cutting-edge lamp production technologies.

TQS and Roof innovative approach consists in offering total mercury yield under extremely safe operation conditions. SAES products total mercury yield is obtained, after lamp tip-off, when TQS or Roof are heated for some time at high temperature.

TQS and Roof are reliable low mercury dosing products capable to release very small quantities of mercury. The adoption of TQS and Roof in fluorescent lamps production allows being compliant with the existing and upcoming more stringent environmental regulations that will be imposed.

TQS is usually mounted to replace one of the lamp cathode shields, while Roof is mounted on top of, or on one side of the lamp cathode. These mercury dispensers can withstand the typical manufacturing process of fluorescent lamps without any problem.

The quality of TQS and Roof is continuously monitored by on-line checking systems, in order to guarantee the maximum reliability and reproducibility of mechanical features and of the mercury dose.

## Product Composition & Models

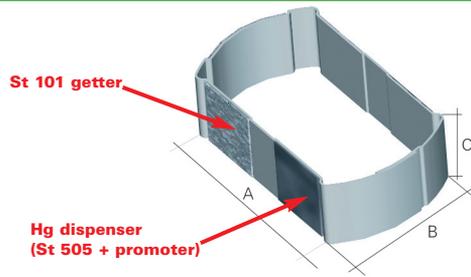
TQS and Roof are based on SAES Getters' High Yield GEMEDIS® material and incorporate a copper-tin family of promoters to ensure that St 505, the proprietary titanium-mercury inter-metallic compound, maximizes Hg release. The lamp performance and lifetime are boosted by SAES St 101® zirconium-aluminum getter alloy, which is part of TQS and Roof structure: after activation, the non-evaporable getter alloy starts absorbing gaseous impurities in the bulb, such as hydrogen that is known to increase lamp starting voltage, and oxygenated gases, which could irreversibly trap Hg through the formation of mercury oxide. St 505, in combination with the promoter and St 101, are coated in different tracks on a nickel plated iron wide strip: TQS and Roof can be customized to specific application requirements, offering extreme flexibility in terms of geometry and number of powder tracks.

The products are capable of withstanding temperature processing in air up to 450 °C without losing mercury, and are suitable to dispense mercury in high-speed horizontal lines, horizontal lines and vertical lines.

we support your innovation

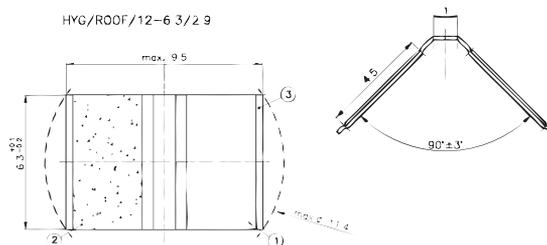
**saes**  
getters

## Standard TQS description



Product code	Product description TQS/AXBXC/	Hg content (mg)	St 101 content (mg)
5E0002	TQS1/16X8X5/4.5	4.5	25
5E0007	TQS1/16X8X5/8	8	10
5E0021	TQS1/18X7X6/6	6	23
5E0023	TQS1/16X8X5/9	9	10
5E0026	TQS1/16X8X5/6.5	6.5	10
5E0038	TQS1/18X7X5/4.5	4.5	10
5E0039	TQS1/13X8X5/4.5	4.5	20
5E0043	TQS1/16X8X5/3.3	3.3	25
5E0056	TQS1/16X8X4.4/2.9	2.9	22

## Roof description



Product code	Product description	Hg content (mg)	St 101 content (mg)
5E0028	HYG/ROOF/12-5/2.5	2.5	8
5E0041	HYG/ROOF/12-8.4/3.5	3.5	13
5E0042	HYG/ROOF/12-8.4/8	8	-
5E0047	HYG/ROOF/12-6.3/3.3	3.3	10
5E0054	HYG/ROOF/12-6.3/2.9	2.9	10

## Product Activation

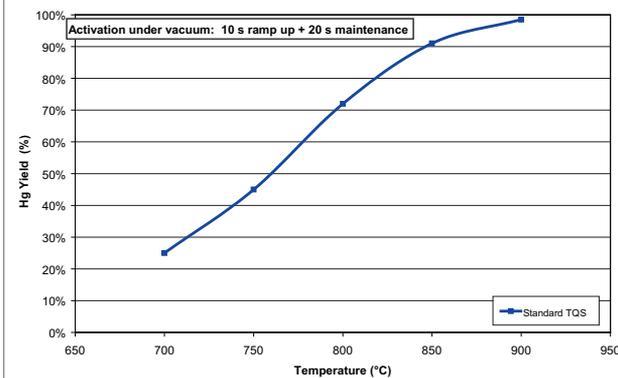
TQS and Roof release Hg and start getting action after lamp tip-off through a specific process, the so called "activation".

During activation, TQS or Roof are heated by radio frequency induction up to 800-900 °C for 15-30 seconds.

The mercury release is enhanced and accelerated by the presence of the copper-tin promoter.

The heating process also allows the getter to get active and remove impurities in lamp.

**TQS - Typical Hg yield curve:  
% of Hg release vs. Temperature**



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

D.LS.87.0