Data Sheet

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GE Components
Marketing & Sales Operation

Lamp Filament and Lead Wire Getters

Getters are special chemicals used to bind together and render inert the impurities that exist during lamp making. Such impurities as water vapor, oxygen, hydrogen and hydrocarbons may cause initial blackening, poor lumen maintenance, arcing, short life and weak and embrittled filaments.

Getter materials can be elements, metals, non-metals or a combination of these. They are usually produced in a liquid form and applied as a uniform coating to lamp parts such as filaments and lead wires.

Several Benefits

Getters have the ability to shorten the exhaust cycle, improve and maintain a high vacuum, improve and maintain the purity of a noble gas atmosphere, act as a de-blacking agent and improve lamp life and efficiency.

Lamp getters are available from GE as a ready to use suspension or as a liquid concentrate that can be formulated in your plant to your own special process requirements. The necessary thinners, binders and diluents, consisting of various concentrations of nitrocellulose, amyl acetate and methanol, are also available from GE.

Spraying loose filaments in a sealed chamber as they are agitated by air pressure provides a uniformly thin coating of getter over the entire surface.

For short run situations or stem shapes that cannot be adapted for mass production, lead wire getters are painted on by hand.

Lamp getters are available from GE in ready to use suspensions.

Most gettering is on the same high production machines where the bulb stem is produced. Here, a cup of getter is raised from its tank to cover a filament. Next in line, an applicator dips into lead getter and gently dabs the lead wires of the completed stem.

Filament Getters

Filament getters are available as either red phosphorus or phosphorus nitride (P3N5) types. The first type, consisting of red phosphorus in a nitrocellulose and amyl acetate suspension, is typically used in vacuum lamps. The addition of cryolite in conjunction with the red phosphorus is recommended in clear bulb lamp construction.

The phosphorus nitride getters offer considerable advantages as a replacement for the more traditional red phosphorus types, especially in gas filled incandescent lamps. These benefits include:

- Not being affected by lamp processing temperatures
- Being inert, they do not hydrolize or react with the suspending solvent
- Present no fire hazards from dried getters (P3N5 is not flammable)

The crystalline P3N5 is milled to a predetermined particle size of approximately five microns and suspended in a suitable organic solvent system, typically amyl acetate. The amount of phosphorus nitride used in each lamp is governed by the amount of solids per liter of solvent. As the slurry solids are increased, more of the P3N5 will be picked up by the lamp filament. These uniformly fine particle size getters result in consistent filament coating weights.

Lead Wire Getters

Lead wire getters consist of a nitrocellulose based suspension of zirconium and aluminum metal powders. They are particularly effective as continuous getters when applied to the hot zone of the lead wire, typically 1 mm from the clamp area.

Lead wire getters are manufactured by GE to provide the following characteristics:

- Ease of application
- Ability to absorb gases encountered during lamp making.
- High gettering rate
- High capacity over a wide temperature range
- Ease of activation
- Chemical stability at lampmaking temperatures

Lamp Filament Getters

Product Description	Solids	Solvent System
P3N5 114-3-145	8 gm/l	Amyl Acetate
P3N5 114-3-148	10 gm/l	Amyl Acetate
P3N5 114-3-150	15 gm/l	Amyl Acetate
P3N5 114-3-165	90 gm/l	Amyl Acetate
Red Phos/Cryolite 114-3-057	60%	Amyl Acetate
Red Phos/Cryolite 114-3-059	61%	Amyl Acetate

Lead Wire Getters

Product Description	Solids %	Solvent System
Al/Zr 114-2-50	35%	Amyl Acetate
Al/Zr 114-2-56	41%	Amyl Acetate
Al/Zr 114-2-62	47%	Amyl Acetate

Diluents, Binders and Thinners

Binder 114-12-054	3.8%	Amyl Acetate
Diluent 114-12-055	NA	Amyl Acetate
Diluent 114-12-160	NA	Methanol

Count On GE's Experience

As one of the world's leading makers of lamps, GE has developed its own expertise on the formulation and application of lamp getters. Our experience is reflected in the product, and in the application engineering assistance we provide for our customers.

Ordering Information

Direct orders for lamp getters, including pertinent engineering details and packaging instructions, should be sent to:

Customer Service Department
GE Chemical Products Plant
1099 Ivanhoe Road
Cleveland, OH 44110
(216) 266-4611

More information is available from the Marketing & Sales Operation listed below.

GE Components Marketing & Sales Operation
21800 Tungsten Road
Cleveland, OH 44117
(216) 266-2451

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