

Traditional UV Oxide Materials:

Hafnium Oxide

HfO_2

Purity: 99.99% - 99.995%

Usable Spectrum: 224 nm - 8 μm

Index: 2.0 @ 500 nm

Density 9.68 g/cc

Color: White or black

Scandium Oxide

Sc_2O_3

Purity: 99.998%

Usable Spectrum: 250 nm - 8 μm

Index: 1.8 @ 500 nm

Density 9.68 g/cc

Color: White

Zirconium Oxide

ZrO_2

Purity: 99.99 %

Usable Spectrum: 230 nm - 7 μm

Index: 2.0 @ 500 nm

Density: 5.68 g/cc

Color: White



Established in 1989 and based in New York, LTS has been pushing boundaries in the development and implementation of high-purity optical coating materials since its inception.

LTS produces high purity and high performance materials for the optics and fiberoptics, electronics, automotive, aerospace, medical, defense, crystal growth, and fuel cell industries, and are constantly developing new products and applications for our clients. We pride ourselves on our superb materials quality: whether it's a standard formulation or researching and developing new chemicals and compounds, we work to provide you with products unparalleled in their respective industries.

Our research and development team comprises experts in chemistry, chemical engineering, mechanical engineering, materials science, vacuum engineering, and high-caliber machining. Our production process is vertically integrated from raw materials procurement to the final finishing process, giving us precise control in creating materials to exact specifications.

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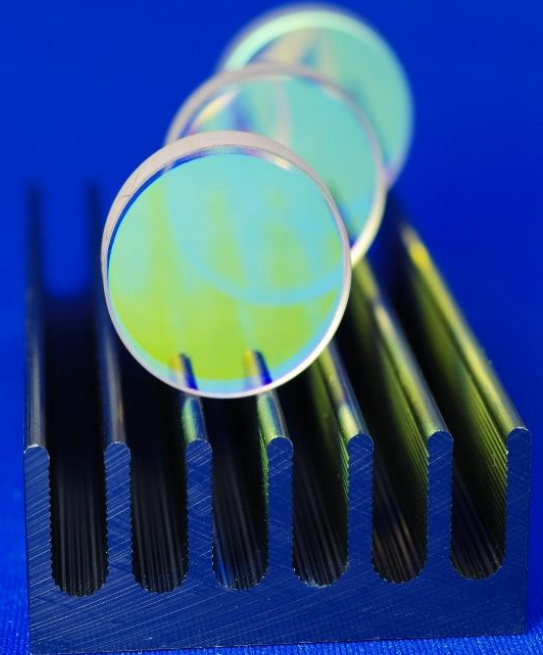
LRLI.US.COM

Optical Coatings from Concept to
Commercialization (OC³)



Rare Earth Scandates

(GdScO_3 , YScO_3 , HfScO_3)



RARE EARTH SCANDATES

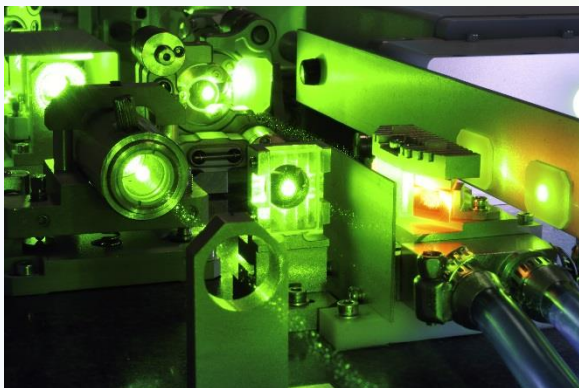
For UV Laser Applications

Scandium oxide is a high laser damage threshold optical coating material for use in UV laser applications at 337 nm and 248 nm. It has a LDT of $>6 \text{ J/cm}^2$ as well a moderately high index of refraction of ~ 1.8 at 550 nm. It is durable and has good adhesion promotion.

These properties make Sc_2O_3 a valuable antireflection / high-reflection and multilayer coatings material for ultraviolet applications as well as visible and infrared.

Unfortunately, due to its ores' rarity, scandium oxide is also very expensive.

For this reason, LTS has developed scandates with similar or better optical properties that are cheaper and more accessible to the medium budget user. These are based on compounding scandium oxide with other rare earth oxides to form ternary compounds with less than half the scandium content but equivalent optical properties, including higher density and refractive index.



High LDT,
High Index,
Cost effective.



Gadolinium Scandate GdScO_3

Useable Spectrum: 230 nm - 6 μm
Index: 2.17 @ 400 nm
Density: 6.6 g/cc
Color: Colorless to white
Melting Point: 2127 $^\circ\text{C}$
Bandgap: 5.7 eV
Dielectric Constant: 20

Yttrium Scandate YScO_3

Useable Spectrum: 250 nm - 11 μm
Index: 1.87 @ 500 nm
Density: 4.8 g/cc
Color: Colorless to white
Melting Point: 1700 $^\circ\text{C}$



Available as Powder,
Sintered pieces,
Melted+outgassed
pieces, and
Sputter targets.
Purity: 99.99 %

Analogous materials
can be made such as
 DyScO_3 and TbScO_3



Hafnium Scandate $\text{HfO}_2\text{-Sc}_2\text{O}_3$

Useable Spectrum: 300 nm - 8 μm
Index: 2.4 @ 500 nm
Density 8.6 g/cc
Color: Pale yellow to white
Melting Point 2827 $^\circ\text{C}$