

Potassium Bromide

KBr

◆ Key Properties of Potassium Bromide (KBr)

🌈 Exceptional IR Transmission: Very broad spectral range from $\sim 0.25 \mu\text{m}$ to $25 \mu\text{m}$, ideal for mid-IR and far-IR systems.

🔍 Low Refractive Index: ~ 1.53 at $10 \mu\text{m}$, supporting high-quality FTIR and infrared spectroscopy.

💧 Highly Hygroscopic: Absorbs moisture quickly and requires dry handling, sealed mounts, or protective coatings.

🔬 Spectroscopy Optimised: Smooth dispersion and high uniformity make KBr ideal for FTIR windows, beamsplitters, and gas-cell optics.


🍃 Soft & Easy to Polish: Allows high optical precision, though surfaces must be protected from moisture and abrasion.


⚙️ Ideal for Analytical Instruments: Widely used in environmental, chemical, and gas-analysis systems requiring deep IR reach.


🔧 Suitable for Sealed Assemblies: Performs reliably when housed in dry cells, desiccant chambers, or protective coatings.


Applications of Potassium Bromide (KBr)


 FTIR Spectroscopy: Widely used for windows, beamsplitters, and interferometer optics due to its 0.25–25 μm transmission.

 Gas Analysis & Environmental Monitoring: Ideal for gas cells and analytical instruments requiring deep mid-IR coverage.

 Mid-IR & Far-IR Optics: Suitable for thermal analysis, chemical identification, and broadband IR optical systems.

 Laboratory Spectroscopy: Common in research setups for analysing organic, inorganic, and environmental samples.

 Sealed & Dry Optical Assemblies: Often used in hermetically sealed housings, desiccated cells, and protected IR instruments.

 Precision Polished Optics: Used for prisms, windows, and IR plates where high optical uniformity is required.

Technical Parameters of Potassium Bromide (KBr)

Property	Typical Value
Transmission Range	0.25 μm – 25 μm
Refractive Index	1.53 @ 10 μm
Density	2.75 g/cm ³
Melting Point	730 °C
Hardness (Knoop)	~7 kg/mm ² (very soft)
Thermal Expansion	~45 $\times 10^{-6}$ /°C
Crystal Type	Cubic (single crystal)
Hygroscopic	Yes (highly)
Chemical Formula	KBr
Applications	FTIR windows, beamsplitters, gas cells, environmental monitoring, chemical analysis, far-IR optics

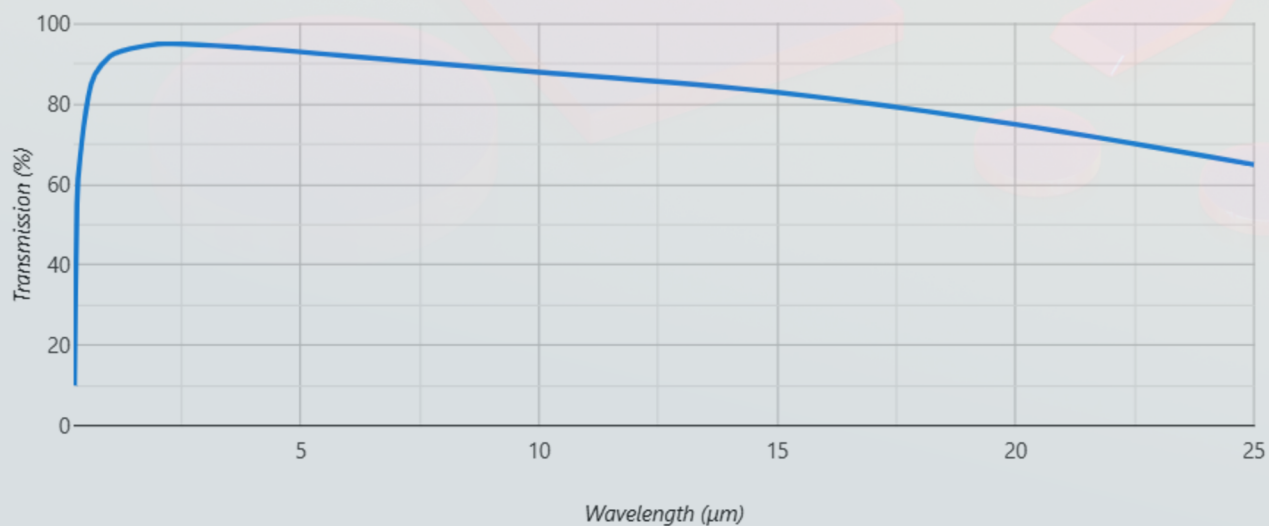
Potassium Bromide (KBr) is a key infrared optical material with ultra-broad transmission from 0.25–25 μm , making it essential for FTIR spectroscopy, gas-analysis cells, environmental monitoring, and mid-far IR optical systems. Its low refractive index (~1.53) and smooth dispersion provide excellent performance for deep-IR measurements and analytical instruments.

KBr is highly hygroscopic, so it must be stored and used in dry or sealed environments, but when properly protected it offers outstanding clarity and IR uniformity. As a soft, easily polished halide crystal, KBr is ideal for FTIR windows, prisms, beamsplitters, and gas-cell optics, delivering reliable IR transmission for laboratory and industrial spectroscopy.

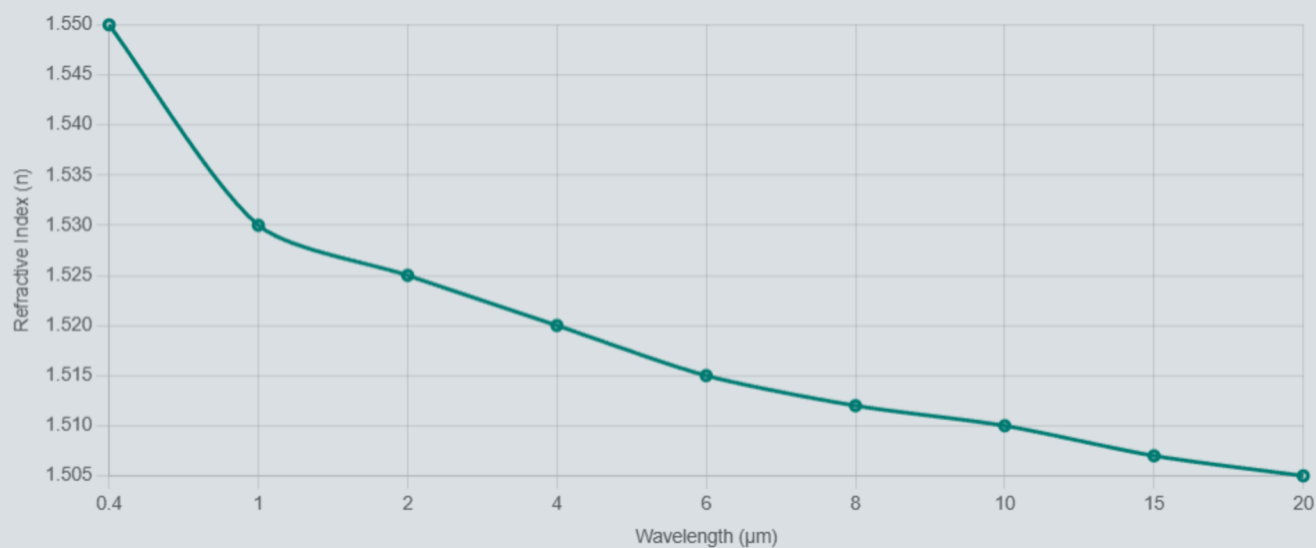


Potassium Bromide (KBr) – Optical & Thermal Graphs

KBr Transmission (0.25–25 μm)



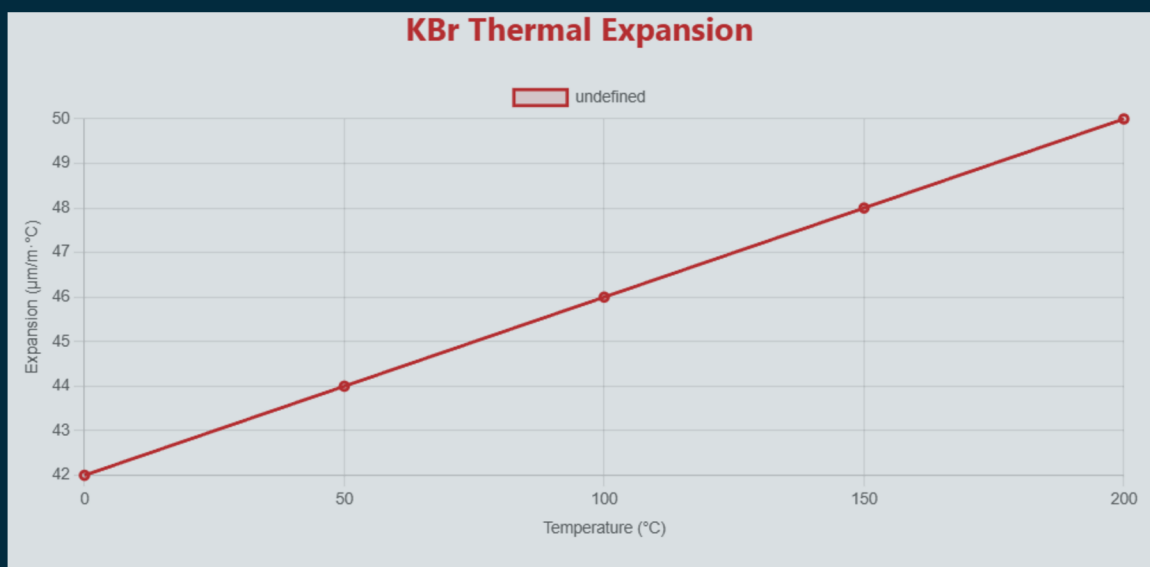
KBr Refractive Index



Potassium Bromide (KBr) provides exceptionally broad infrared transmission from 0.25 μm to 25 μm , covering the mid-IR and far-IR regions. With its low refractive index (~ 1.53) and smooth dispersion, KBr is well suited for FTIR spectroscopy, gas-analysis cells, environmental monitoring systems, and broadband mid-IR optical components.

KBr offers excellent spectral uniformity and delivers reliable optical performance for laboratory and analytical IR applications. As a soft, easily polished halide crystal, it can be manufactured into IR windows, prisms, plates, beamsplitters, and gas-cell optics, providing high-quality transmission across the deep IR range.

Being highly hygroscopic, KBr must be handled and stored in dry or sealed environments, but when protected, it remains a dependable choice for FTIR instruments, chemical analysis systems, gas-cell assemblies, and mid- to far-IR spectroscopy platforms.



FAQ

Q: What is Potassium Bromide (KBr) used for?

A: Potassium Bromide is widely used in FTIR spectroscopy, gas-analysis cells, environmental monitoring systems, and mid- to far-IR optical instruments, thanks to its extremely broad 0.25–25 μm transmission.

Q: What makes KBr different from other infrared materials?

A: KBr provides exceptionally wide IR transparency with a low refractive index and smooth dispersion, making it ideal for deep-IR spectroscopy. However, unlike durable non-hygroscopic materials, KBr is highly hygroscopic and requires dry handling and storage.

Q: Is Potassium Bromide hygroscopic?

A: Yes. KBr is strongly hygroscopic and readily absorbs moisture, which can cause fogging and surface degradation. It must be kept in sealed or desiccated environments.

Q: Is KBr suitable for FTIR and mid-IR spectroscopy?

A: Absolutely. KBr is one of the most widely used materials for FTIR windows, beamsplitters, sample cells, and analytical infrared optics due to its very broad and uniform IR transmission.

Q: What types of optical components can be made from KBr?

A: KBr can be fabricated into windows, prisms, plates, beamsplitters, and gas-cell components, especially for laboratory and analytical instrumentation.

Q: How durable is Potassium Bromide?

A: Optically, KBr performs extremely well, but it is soft, easily scratched, and moisture-sensitive. For this reason, it is typically used in protected mounts or dry environments.

Q: Can KBr optics be anti-reflection coated?

A: Yes, but coatings must be compatible with hygroscopic materials. KBr optics are often supplied with protective coatings or housed in sealed assemblies to increase lifespan and reduce moisture exposure.

Q: Is KBr safe to handle?

A: Yes. KBr is non-toxic and safe to handle, but it must be protected from moisture. Use dry gloves, low-humidity environments, and sealed storage for best optical performance.