

Baader BBHS[®] Reflective Properties



Baader BBHS[®] reflective properties, exclusively available on Baader Sitall Ceramic Mirrors and on selected Baader prism Star Diagonals:



BBHS[®] reflection coatings predominantly are being utilised on our highest quality grade 2" BBHS[®] Sitall Stardiagonals (#2456115 – incl. black housing and 2" ClickLock clamp) as well as on the BBHS[®] T-2 Sitall Stardiagonal (#2456103) – where the housing features a male and female T-2 thread – for shortening the optical path with bino use, and to offer the utmost in adaptation variability as well as much more light throughput than with any conventional 1¼" star diagonal.

BBHS[®] stands for **B**road **B**and **H**ard **S**ilver. When applied onto our Sitall (zero expansion glass-ceramics) substrates, these multiple deposited layers of hard silver are being sealed by a set of dielectric layers to achieve long term durability. With this advance in coating technology our BBHS[®] coating lifetime equals that of a high quality AlSiO₂ coating, matching the durability of standard aluminium coated diagonals (and telescope mirrors) which have been in wide use for many years. The BBHS[®] spectral bandpass is much wider though, when comparing with our 50 layer all dielectric coatings utilized on the 2" ClickLock Star Diagonals. The all dielectric coating system on the 2" ClickLocks is designed to transport 98 to 99 percent of a spectral window ranging from 400 to ~700 nm – at an angle of exactly 90°. By design, the Baader all dielectric coating system perfectly blocks UV and IR and works as added protective measure when observing the Sun in white light or with H-alpha filters – since only visual wavelengths from 400 to 700 nm will reach focus. BBHS[®] silver in contrast likewise has 98 to 99% reflective property but delivers a much wider spectral window, ranging from 390 out to 2000 nm – while not being restricted to exactly a 90° angle – and with the silver producing absolutely zero scattered light.

With the Baader BBHS[®] coating a well trained eye absolutely does distinguish more and richer colour on planets such as Jupiter, Mars and even on the moon – especially in conjunction with APO refractors. Predominantly during observation of planetary objects or bright nebulae, even at very high magnification, the BBHS[®] recipe does intensify colour, especially in the red end of the spectrum. It is quite amazing for many people to learn how very sensitive the human eye really is far out into the UV and NIR – far beyond conventional belief (respectively conventional experience). This experience is not to be had with any sole dielectric or multilayer aluminium reflective coatings and – most noticeable – there is not any trace of haze or stray light as with many other coating systems. The brilliance of the BBHS[®] silver when observing with outstanding optics is simply breathtaking.

The Baader BBHS[®] coating system is solely applied onto zero-expansion glass (Sitall) and (see below) onto the Baader-T-2 36 mm and 2" 50 mm 90° prisms, as well as the T-2 and 2" (Astro quality grade erecting) Amici-prisms. In conjunction with the magnesium body of the 2" star diagonal, the Sitall-based BBHS[®] coating does perform unparalleled, in remaining at thermal equilibrium under all circumstances and in supplying a sharp stable and calm image of previously unknown brilliance.

The Baader 2" prism star diagonal with BBHS[®] coating (#2456117) as well as the T-2 prism diagonal (#2456095) – and lastly both erecting T-2 (#2456130) and 2" (#2456120) Amici (roof)-prisms – since more than 20 years feature the same BBHS[®] silver coating, but here it is applied onto the hypotenuse face of the prism which is then copper sealed and black anticorrosion-painted. This is an extremely elaborate process and we did not talk about it for almost 20 years. Actually we trusted that just the observing quality of this VERY complicated coating system would go around by word of mouth – which it did magnificently. Over the years, this "unknown BBHS[®] coating" has made all our prism star diagonals quite famous.

Many people would question the usefulness of any kind of reflective coating on any prism and they are right – in the first year. The problem is with aging. Over time, a total reflection prism surface will get stained from mould and moisture. Many of the zero-cost Chinese and Japanese prism diagonals have their hypotenuse face separated from the housing with nothing more but a black cardboard – directly touching the prism face. Over time the cardboard gradually makes ever more contact with the glass. If you want to know, take your prism body apart and see what's inside. A ten year old prism theoretically should be as bright as on day one owing to total reflection properties. In fact, the prism reflective face will age and gradually loose brilliance – with the observer being in total acclimatization with the slowly degrading prism. Much to the contrary, the Baader-BBHS[®] coating as applied onto prism surfaces is sealed for life. Even after 20 years have passed, our customers of T-2 and 2" prism diagonals cannot distinguish any lack of brilliance – not to say lack of brightness – on their prism faces. "No news is good news".

The question of "mirror or prism" for a telescope is accompanying our product development since ages. We have gained some intricate knowledge about the preferences of certain optical configurations for either prisms or mirrors over the years – ask us. Many of these insights we regard as proprietary. Hence we do leave it to the findings – and taste – of gifted astronomers, to let these experienced observers decide on their own what they prefer to use. Check out the various test reports published about our stuff on forums such as CN and SGL – for instance those done by William Paolini (see links on top of the websides of Section 28 & 29).

A Note on Star Diagonal Optical Quality: We deliberately refrain from trying to gain trust by shelling out numbers and participating in any kind of "number competition". In recent years it has become a common practice for OEM traders with little knowledge about optics daring to tag products with the highest number claim. Talking about 1/20 wave or better on a star diagonal is ridiculous because this "may be" a theoretical result under lab conditions (if were true at all). In order to retain such values in the field, the housing – and a horde of other parameters must be kept under tight mechanical and temperature control. We do our optical and mechanical design based on knowledge attained during our 50 years experience. All mirrors and prisms inside our housings are carefully mounted and insulated to keep the excellent optical properties at any temperature range (hence we use Sitall as mirror substrate) – and there are many more side considerations to our designs not obviously visible. We stand behind each of our products and do the utmost to make it right. (BBHS[®] is a registered trademark ® of Baader Planetarium)



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