

APPLICATION NOTE

THZ-WC-13: WINSTON CONE ACCESSORY



WINSTON CONE

A Winston Cone is an optical condenser designed to maximize the concentration of Far IR, THz and/or Sub millimeter radiation on a detector that is much smaller than the system aperture.

SPECIFICATIONS

1. Spectral Range: 1 μm to 3000 μm
2. Winston Cone
 - a. Input Diameter: 13 mm
 - b. Output Diameter: 1.5 mm
 - c. Length: 49 mm
3. Delrin Collar includes two set screws to position and retain the Winston Cone
4. Collar includes SM1 threaded front-end to accommodate Interchangeable THZ windows
5. Collar Size: 32 mm \varnothing x 39D mm
6. Total Weight: 50 g

THZ-WC-13 WINSTON CONE ACCESSORY

The THZ-WC-13 is a non-imaging optic designed for use with our THZ1.5B and THZ5B Radiometer Probes. It can increase the Detectivity ($\text{W}\cdot\text{cm}/(\text{Hz})^{1/2}$) by a factor of 25 for the THZ1.5B and 5 for the THZ5B.

The Winston Cone is a broadband, parabolic reflector with a 13 mm input aperture and 1.5 mm output aperture. It is mounted in a Delrin collar that threads into the body of our THZ-B probe and places the output aperture very close to the LiTaO_3 pyroelectric detector. It can be adjusted to optimize the optical gain.

The THZ-WC-13 collar includes a SM1 threaded front cavity that allows the addition of our standard THZ windows.

This accessory is to be used with our THZ-B probes when the THz beam or image is much larger than our detector element. It is most effective when the 13 mm input aperture is overfilled by the radiation.

It is not designed for use with the THZ9B probe.

APPLICATION NOTE



The THZ-WC-13 Accessory is shown prior to installation on our THZ1.5B-MT Probe. The Winston Cone Collar was designed to accommodate THZ windows and is shown with a TPXW window installed. Note that there are two nylon tipped set screws in the collar, that allow adjustment of the position of the Winston Cone to maximize the optical gain.

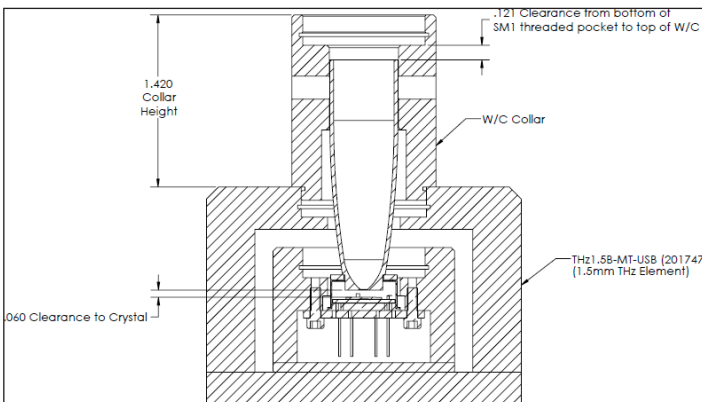


Here the THZ-WC-13 has been installed (threaded into) the THZ1.5B probe body. This accessory is designed to work with both the THZ1.5B and THZ5B probes, though the greatest benefit is realized with the 1.5 mm detector.

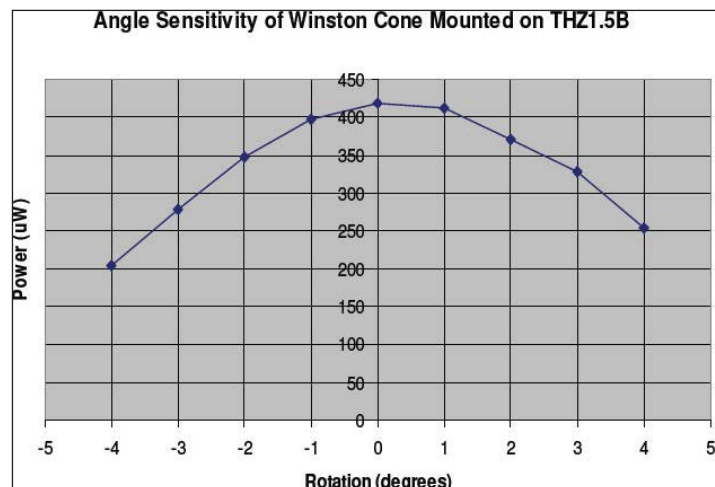
Note: It is not compatible with the THZ9B probe and could damage the detector element if used.



The final photo shows the THZ-WC-13 mounted on the THZ1.5B probe but with the window and aperture plate removed. This set up would result in the largest unrestricted input aperture (i.e. 13 mm) and highest optical gain.



This cross section shows the THZ-WC-13 attached to a THZ1.5B probe with the Winston Cone in the optimum position.



The graph above shows the angle sensitivity of the probe and Winston Cone assembly when rotated in uniform radiation field (i.e. extend black body source). Alignment is important when using this accessory.