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#### TEST DATA TO BE SUPPLIED

Each of the parts relating to purchase order G122548 will be supplied with spectral test data. Barr Associates, however, is not able to test the narrowband filters (1644nm, 2124nm, 2168nm) to the letter of the specification, due to equipment capabilities. Following is an explanation of the data that will be supplied to show the parts do indeed meet spec.

The specification in question is "Transmission  $\geq 90\%$  of peak over all angles  $0^\circ$  to  $13.5^\circ$  AOI". Since Barr does not have the capability to test in this wavelength range with a collimated light source, we will supply theoretical data as well as actual test data at  $f/8$  ( $\pm 3.6^\circ$ ). When we tilt the part to  $13.5^\circ$  AOI, however, we would be basically seeing an average of about  $10^\circ$  to  $17^\circ$ . Because there is only about 1% transmission at  $17^\circ$  AOI for any of these filters, the data would be distorted and therefore meaningless. The parts will be tested at  $0^\circ$  and  $10^\circ$  AOI on a witness sample.

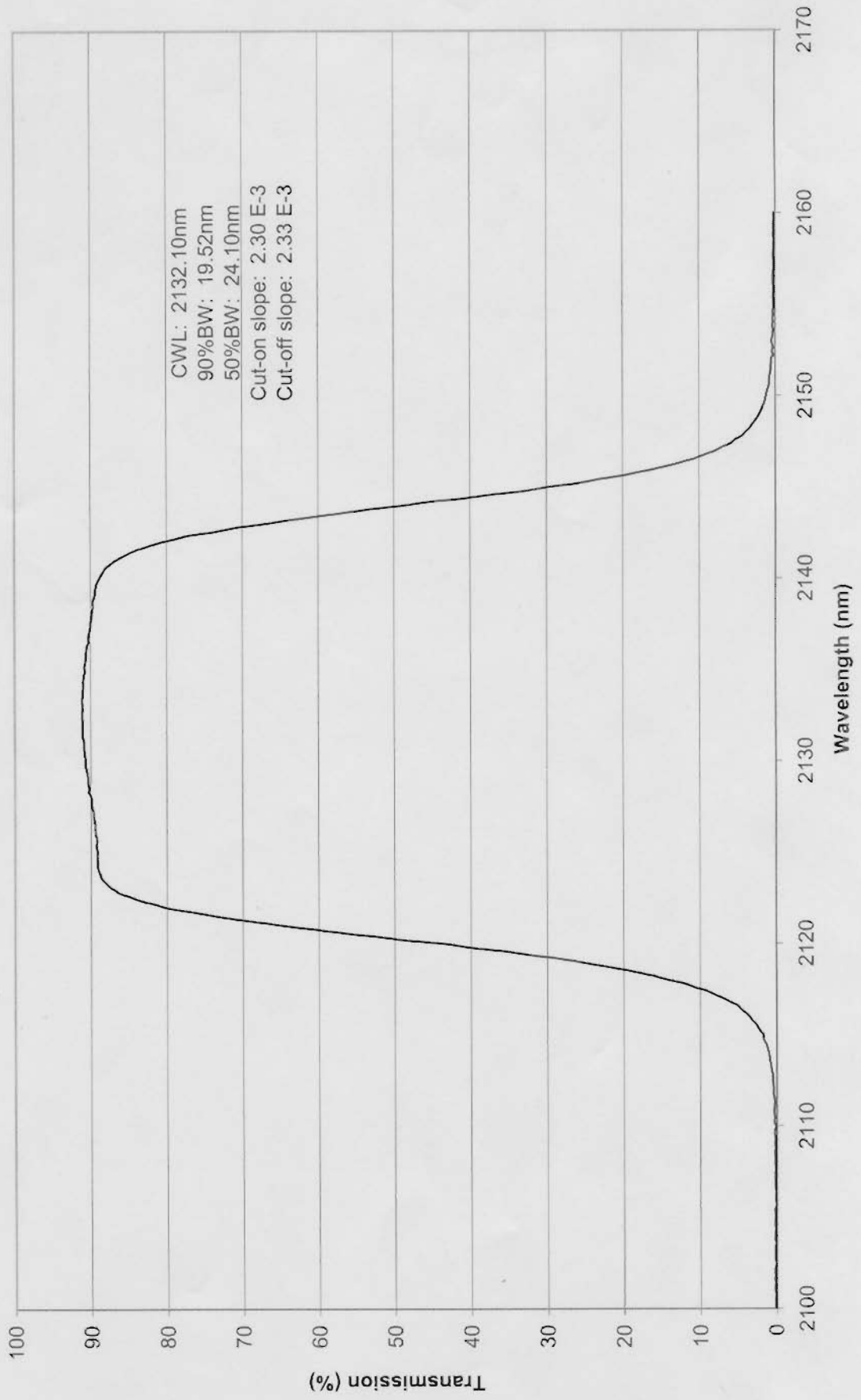
Data being supplied with the narrowband components:

1. Actual test data of the actual part, performed at  $0^\circ$ ,  $f/8$ .
2. Actual test data of a witness sample at  $0^\circ$  and  $10^\circ$ ,  $f/8$ .
3. Theoretical data normalized to actual data (from item 1, above), including:  $0^\circ$  at  $f/8$ ,  $10^\circ$  at  $f/8$ ,  $0^\circ$  collimated and  $13.5$  degrees collimated.
4. Actual thermal test data at  $0^\circ$  AOI and  $298^\circ\text{K}$  and  $77^\circ\text{K}$ .
5. Near band blocking data at  $0^\circ$  AOI and  $298^\circ\text{K}$ .

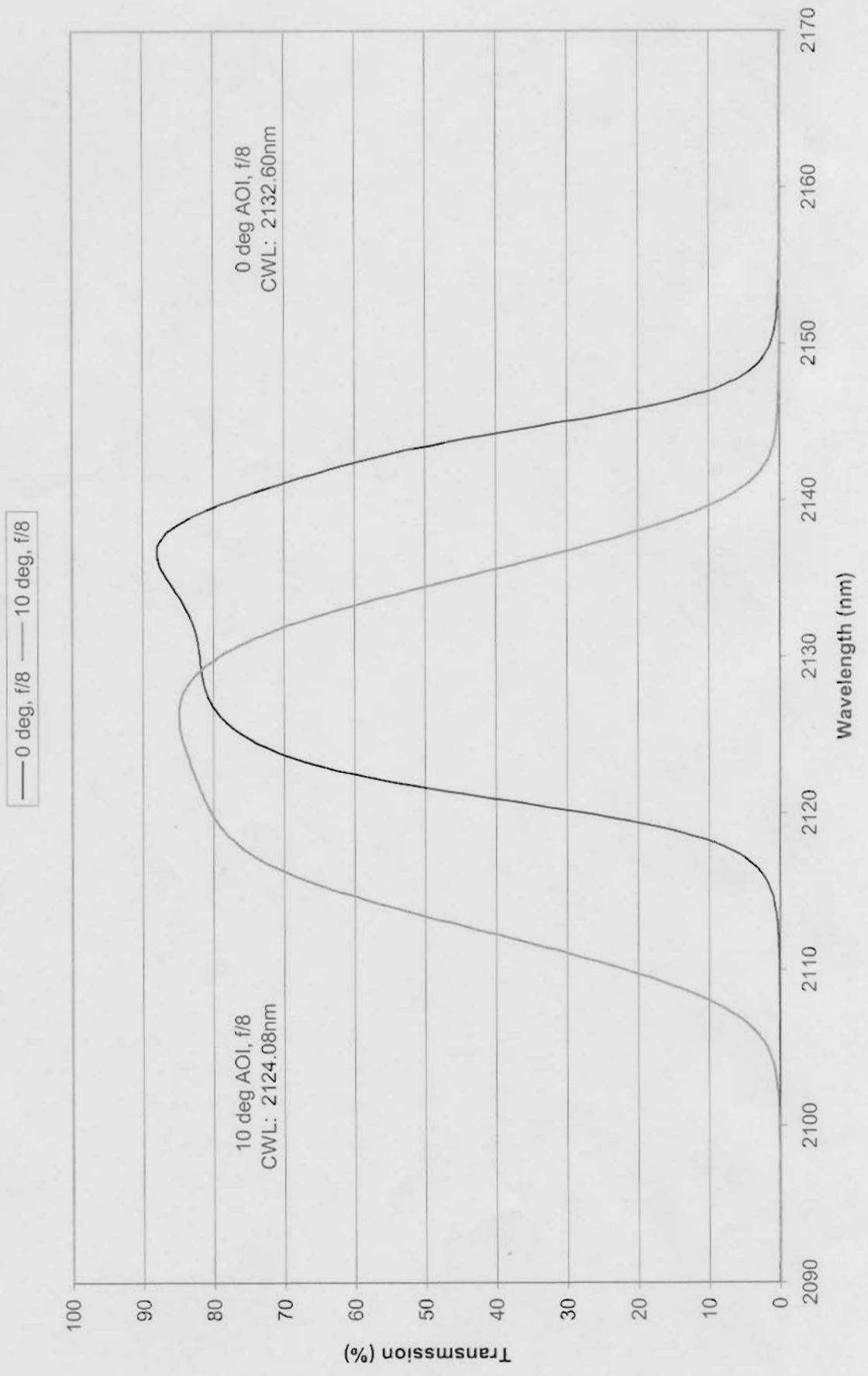
Data supplied with the blocker components:

1. Actual test data of the actual part, performed at  $0^\circ$ ,  $f/8$ .
2. Actual thermal test data at  $0^\circ$  AOI and  $298^\circ\text{K}$  and  $77^\circ\text{K}$ .
3. Blocking data 300-4000nm.

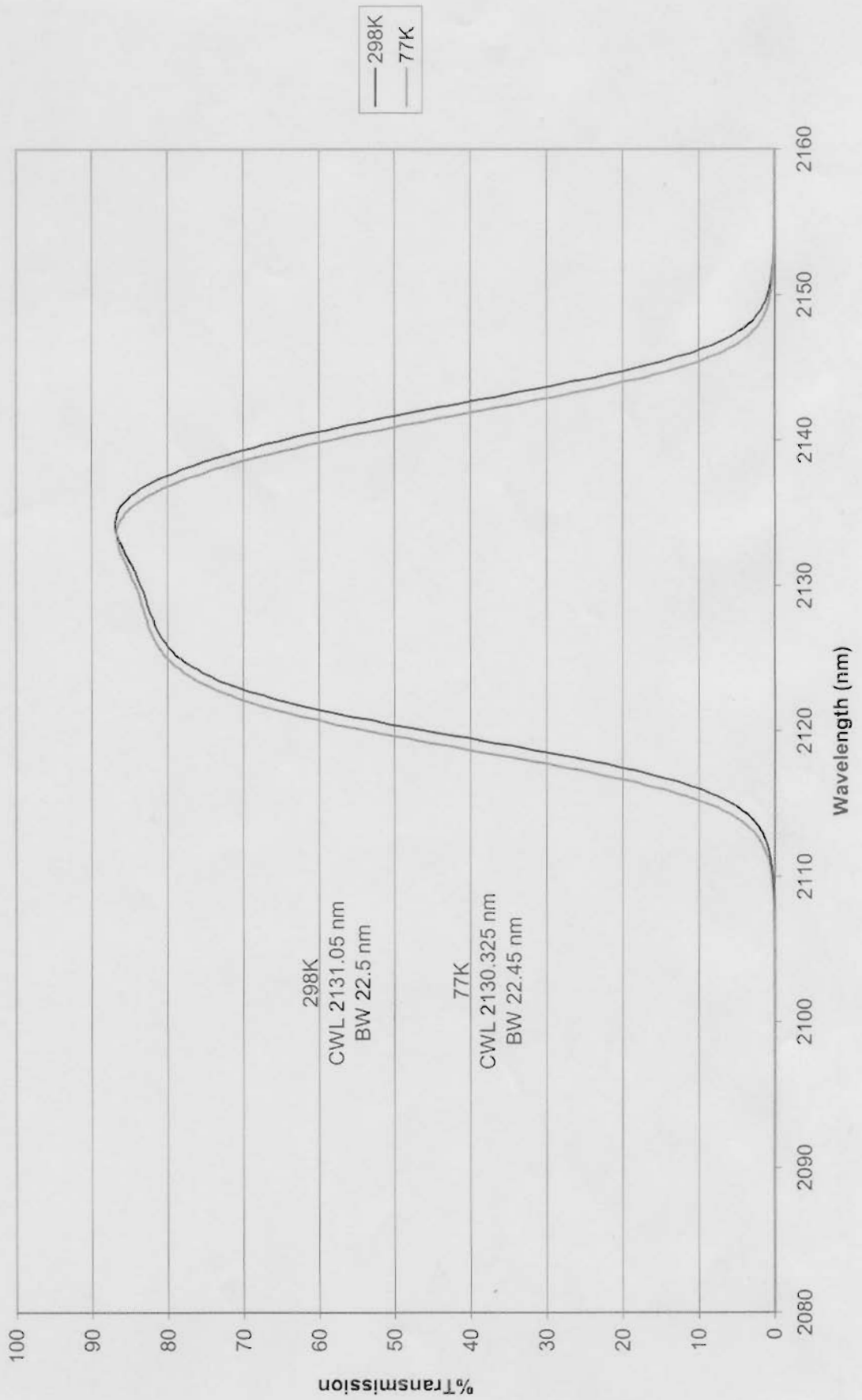
### 2124nm Narrowband at 0 degrees AOI, f/8



2124nm Narrowband - Angle shift of witness sample



# 2124nm Cold Shift on witness sample



### 2124nm Narrowband - Theoretical angle data

