**GROUND LEVEL OZONE TESTING**

The test is over a hundred years old and was developed by ***Dr. Schoenbein*** in the early 1800's. The test paper he developed contains Potassium Iodide, Corn Starch and water. I would suggest that you use distilled water to make this paper and for the final reading. Schoenbein's paper is placed in an area away from light for eight hours to allow for a reaction. This test is based on the oxidation capability of ozone.
Ozone in the air will oxidize the potassium iodide on the Schoenbein paper to produce iodine. The iodine reacts with starch and produces a purple color. The exact shade of purple correlates to the amount of ozone present in the air. The two reactions involved are:

**2KI + 03 + H2O 2KOH + O2 + I
I2 + starch Blue or Purple color**

**Schoenbein Paper Preparation. . . . . . . . . . . . . . . .**

1. Place 50 ml of water in a 250ml beaker then add 2.5g of corn starch.
2. Heat and stir mixture until it gels. The mixture is gelled when it thickens and becomes somewhat translucent.
3. Remove the beaker from the heat and add .5g of potassium iodide and stir well. Cool the solution.
4. Lay a piece of filter paper on a glass plate and carefully brush the paste onto the filter paper. Turn the filter paper over and do the same on the other side. Apply the paste as uniformly as possible. The paper can be exposed for immediate testing at this point.
5. Allow the paper to dry. Do not set in direct sunlight. A low-temperature drying oven works best. To save time, place the paper on a microwave-safe plate and microwave on high for 30 to 60 seconds.
6. Cut the filter paper into 1inch wide strips, place them in a zipper-lock plastic bag or glass jar out of direct sunlight.
\*Wash hands thoroughly with soap and scrub under fingernails with a brush after working with the potassium iodide mixture.

**Testing Procedure. . . . . . . . . . . . . . . . . .**

1. Dip a strip of test paper in distilled water and hang it at a data collection site out of direct sunlight. Make sure the strip can hang freely.
2. Expose the paper for approximately eight hours. Seal it in an airtight container if the results will not be recorded immediately.
3. To observe and record test results, dip the paper in distilled water. Observe the color and determine the Schoenbein Number using the Schoenbein color scale.
4. Determine the relative humidity of the data collection site by using a bulb psychrometer or local weather data. Round off the relative humidity reading to the nearest 10 percent. (High relative humidity makes the paper more sensitive to ozone, and a higher Schoenbein Number is observed. To correct for this, the relative humidity must be determined and figured into the calculation of ozone contration.) Refer to the Relative Humidity Number Chart. Along the bottom of the chart, find the point that corresponds to the Schoenbein number that you recorded. From that point, draw a line upward until it intersects with the curve that corresponds to your humidity reading. To find the ozone concentration in parts per billion, draw a perpendicular line from the Schoenbein number/relative humidity point of intersection to the left side of the chart.

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This is the color scale that shows the ozone levels.

Use this graph to get your results from the color above.

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| Schoenbein Color Scale |
| 0-3 | Little or no change |
| 4-6 | Lavender Hue |
| 7-10 | Blue or Purple |

