UNIVERSITY OF MINNESOTA **Memorandum**

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Dear Dr. Schultz,

The functional analysis of ten pre-sterilization "Mini-Squair" smoke capture devices was determined by measuring the smoke capture effectiveness. Smoke was generated by cutting pork tissue using an electrosurgical pencil in a test chamber and measurements of the smoke concentrations were performed downstream in an exhaust duct using a condensation particle counter. The "Mini-Squair" was connected to a smoke evacuator pump that was turned on and off to determine its smoke capture effectiveness. Room air background concentrations were measured and subtracted. Figure 1 shows a schematic diagram of the test setup. Nascent Surgical, LLC provided all of the "Mini-Squair" smoke capture devices that were tested at the Particle Calibration Laboratory of the University of Minnesota under my direction.

The smoke capture effectiveness was determined by measuring the smoke penetration using the following equation:

$$\text{Pen.}, \% = [C_{on}-C_{BG}]/[C_{off}-C_{BG}]*100$$

where:
- Pen. = Smoke penetration in percent
- $C_{on}$ = Concentration in exhaust duct with Mini-Squair turned on [#/cc]
- $C_{off}$ = Concentration in exhaust duct with Mini-Squair turned off [#/cc]
- $C_{BG}$ = Concentration of room air background [#/cc]

and, the smoke capture effectiveness is defined as:

$$\text{Eff.}, \% = 100-\text{Pen.}, \%$$

Table 1 provides the smoke capture effectiveness of each "Mini-Squair" device along with the average of the ten devices tested, which was found to be 98.0%.

Sincerely,

Bernard Olson, Ph.D.
Particle Calibration Laboratory Manager