Supplemental information for

**Automated SEM image analysis of the sphere diameter, sphere-sphere separation and opening size distributions of nanosphere lithography masks**

*Thomas Riedl and Jörg K.N. Lindner*

Department of Physics and Center for Optoelectronics and Photonics Paderborn (CeOPP), Paderborn University, Warburger Straße 100, 33098 Paderborn, Germany

**1. Interstice equivalent diameter**

**1.1 Interstice formed by three spheres of identical diameter**

Figure S1 depicts a top-view of three spheres of identical diameter , which are in contact with each other and thus define an interstice. The area  of this interstice results from the area difference between the isosceles triangle ABC, , and three times the 60° sector  of the circular sphere outline:

 . (S1)

By equating  to the area of a circle with diameter , the interstice equivalent diameter is obtained:

 . (S2)



Fig. S1. Top-view schematic of three spheres of diameter  in contact with each other thus defining an interstice (marked in pink).

**1.2 Interstice formed by three spheres of arbitrary diameters**

Now let us consider the general case of an interstice formed by three spheres of diameters ,  and , forming an interstice (Figure S2). Here, the angles *a*, *b*, *g* can deviate from 60°.



Fig. S2. Top-view schematic of three spheres of diameters ,  and  in contact with each other thus defining an interstice (marked in pink).

The interstice equivalent diameter writes

 

with angles 

 

  . (S3)

From these equations, the theoretical interstice diameter distribution for the experimentally detected sphere diameters is constructed.