Supplemental information for

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

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**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°.

Ein Bild, das drinnen, grün, Uhr enthält.

Automatisch generierte Beschreibung

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.