CLAIMS

1. A metrology target comprising:

a first working zone including one or more instances of a first pattern, wherein the first working zone is rotationally symmetric; and

a second working zone including one or more instances of a second pattern, wherein the second working zone is rotationally symmetric, wherein at least one of the first pattern or the second pattern is a Moiré pattern formed from a first grating structure with a first pitch (p_1) along a measurement direction on a first sample layer and a second grating structure with a second pitch (p_2) along the measurement direction on a second sample layer, wherein the second pitch (p_2) is different than the first pitch (p_1), wherein a center of rotational symmetry of the first working zone and a center of rotational symmetry of the second working zone overlap when a first overlay error between the first sample layer and the second sample layer is zero, wherein a difference between the center of rotational symmetry of the first working zone and the center of rotational symmetry of the second working zone along the measurement direction is indicative of the first overlay error between the first sample layer and the second sample layer along the measurement direction,

wherein the first pattern comprises one or more instances of a first Moiré pattern, wherein the first Moiré pattern includes the first grating structure along the measurement direction on the first sample layer and the second grating structure along the measurement direction on the second sample layer;

wherein the second pattern comprises one or more instances of a second Moiré pattern, wherein the second Moiré pattern includes a third grating structure with a third pitch (p_3) along the measurement direction on the first sample layer and a fourth grating structure with a fourth pitch (p_4) along the measurement direction on the second sample layer, wherein the fourth pitch (p_4) is different than the third pitch (p_3); and

wherein the first overlay error along the measurement direction corresponds to a shift of the second sample layer with respect to the first sample layer, wherein the first working zone has a first conditional Moiré factor $M_1 = p_1/(p_1-p_2)$, wherein the second working zone has a second conditional Moiré factor $M_2 = p_3/(p_3-p_4)$, wherein the first overlay error along the measurement direction corresponds to the difference between the center of rotational symmetry of the first working zone and the center of rotational symmetry of the second working zone adjusted by a Moiré gain of $M_g = M_1 - M_2$.

2. The metrology target of claim 1, wherein the first grating structure and the second grating structure fully overlap.

3. The metrology target of claim 1, wherein at least one of the first working zone or the second working zone is symmetric to rotations of at least one of 90º or 180º.

4. The metrology target of claim 1, wherein at least one of the first working zone or the second working zone includes features placed diagonally around the center of rotational symmetry.

5. The metrology target of claim 1, wherein M_1 and M_2 have opposite signs.

6. The metrology target of claim 1, wherein the first pitch equals the fourth pitch (p_4), wherein the second pitch (p_2) equals the third pitch (p_3).

7. The metrology target of claim 1, wherein at least one instance of the first pattern is separated from at least one instance of the second pattern by an exclusion zone to mitigate cross-talk.

8. The metrology target of claim 7, wherein the exclusion zone is at least 0.25 microns.

9. The metrology target of claim 1, wherein the first working zone includes two instances of the first pattern, wherein the second working zone includes two instances of the second pattern.

10. The metrology target of claim 1, wherein the first working zone includes two instances of the first pattern, wherein the second working zone includes one instance of the second pattern.

11. The metrology target of claim 1, wherein the target further comprises:

a third working zone including one or more instances of a third Moiré pattern, wherein the third Moiré pattern includes a fifth grating structure with a fifth pitch (p_5) along the measurement direction on the second sample layer and a sixth grating structure with a sixth pitch (p_6) along the measurement direction on a third sample layer, wherein the sixth pitch (p_6) is different than the fifth pitch (p_5), wherein a difference between the center of rotational symmetry of the first working zone and a center of rotational symmetry of the third working zone along the measurement direction corresponds to a second overlay error between the first sample layer and the third sample layer along the measurement direction.

12. The metrology target of claim 1, wherein the target further comprises:

a third working zone including one or more instances of a third Moiré pattern, wherein the third Moiré pattern includes a fifth grating structure with a fifth pitch (p_5) along the measurement direction on the first sample layer and a sixth grating structure with a sixth pitch (p_6) along the measurement direction on a third sample layer, wherein the sixth pitch is different than the fifth pitch (p_5), wherein a difference between the center of rotational symmetry of the second working zone and

a center of rotational symmetry of the third working zone along the measurement direction corresponds to a third overlay error between the second sample layer and the third sample layer along the measurement direction.

13. The metrology target of claim 1, wherein the target further comprises:

a third working zone including one or more instances of a third Moiré pattern, wherein the third Moiré pattern includes a fifth grating structure with a fifth pitch (p_5) along the measurement direction on the first sample layer and a sixth grating structure with a sixth pitch (p_6) along the measurement direction on a third sample layer, wherein the sixth pitch is different than the fifth pitch (p_5).

14. The metrology target of claim 1, further comprising:

a first additional working zone including one or more instances of an additional first pattern, wherein the first additional working zone is rotationally symmetric; and

a second additional working zone including one or more instances of an additional second pattern, wherein the second additional working zone is rotationally symmetric, wherein a center of rotational symmetry of the first additional working zone and a center of rotational symmetry of the second additional working zone overlap when the first overlay error between the first sample layer and the second sample layer is zero, wherein a difference between the center of rotational symmetry of the first additional working zone and the center of rotational symmetry of the second additional working zone along the measurement direction corresponds to a third overlay error between the first sample layer and the second sample layer along an additional measurement direction.

15. The metrology target of claim 14, wherein at least one of the first additional pattern or the second additional pattern is a Moiré pattern formed from a first additional grating structure with a first additional pitch along the additional measurement direction on the first sample layer and a second additional grating structure with a second additional pitch along the additional measurement direction on the second sample layer, wherein the second additional pitch is different than the first additional pitch.