# Sphere 3D Test design

Test Method Intersect Ray

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | Light ray misses the Spere  Typ: **MISS**  Status: **MISS**  Test Case:  test\_1a\_LightRayMissesSphere |  | T does not exist |

|  |  |  |  |
| --- | --- | --- | --- |
| 2a. | Light ray touches sphere  Typ: **Touch**  Status: **INTERSECT**  Test Case:  test\_2a\_LightRayTouchesSphere |  | One value of t  T > 0 |
| 2b. | Light ray touches behind sphere  Typ: **TOUCHBEHIND**  Status: **MISS**  **Test Case:** |  | T < 0 |
| 2c. | Light ray starts touching on sphere  Typ: **Touch**  Status: **MISS**  **Test Case:**  test\_2c\_LightRayStartsTouchingOnSphere |  | T == 0 |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| 3a. | Standard intersection between spere and light ray.  Typ: **INTERSECTION**  Status: **INTERSECT**  **Test Case:**  test\_3a\_LightRayStandardIntersection |  | T1 > 0  T2 > 0 |
| 3b. | Sphere behind the light ray  Typ: **BEHIND**  Status: **MISS**  **Test Case:**  test\_3b\_LightRayBehindIntersection |  | T1 < 0  T2 < 0 |
| 3c. | Typ.: INNER  Status: **INTERSECT**  **Test Case:**  test\_3c\_LightRayInnerIntersection |  | T1 <= 0  T2 > 0 |
| 3d. | TYP: **TOUCHBEHIND**  Status: **MISS**  Test Case:  test\_3d\_LightRayStartOnSphere |  | T1 < 0  T2 == 0 |
|  |  |  |  |

Systematic of Cases with two values of t

|  |  |  |  |
| --- | --- | --- | --- |
| T1 | T2 |  | Case 3b |
| < 0 | < 0 | Behind | Case 3b |
| => 0 | < 0 | Illegal t1 must be smaller than t2 |  |
| = 0 | =0 | Start in Touch  Case 2c | Case 2c |
| < 0 | =0 |  | Case 3d |
| = 0 | > 0 | Start inner in the surface | Case 3c |
| > 0 | >0 | Normal intersection | Case 3a |