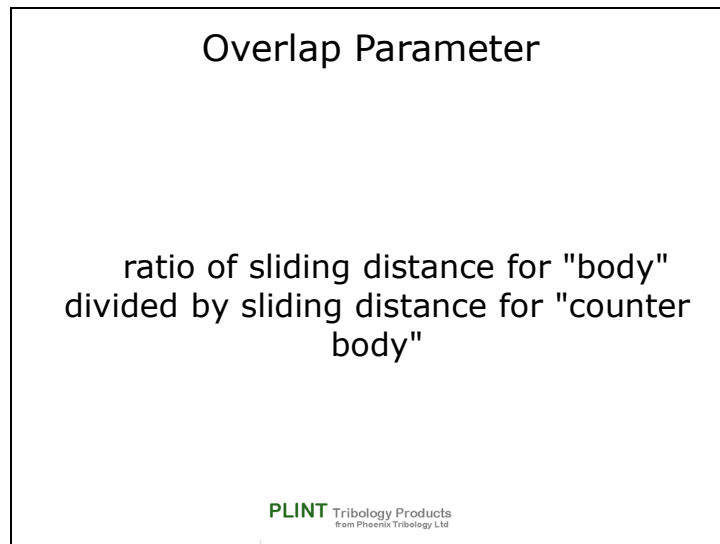


Guidance – Overlap Parameter

Extract from:

<https://www.phoenix-tribology.com/wp-content/uploads/products/guidance/Tutorial-Tribology-Testing.pdf>



If we have a 10 mm diameter pin running on a 100 mm circumference disc track, then in one revolution, a point on the pin experiences 100 mm of sliding. However, a similar point on the disc sees only a single pass of the pin, hence a sliding distance of just 10 mm. Double the track circumference and the point on the pin sees 200 mm sliding per revolution whereas the point on the disc still only sees 10 mm.

Hence, in this example, changing the track diameter has a direct impact on how the sliding distance, hence the wear, is shared between the two surfaces. It also means that running repeat tests at different track diameters, at the same surface speed on the same disc, will generate different wear rates.

By contrast, with the thrust washer arrangement, the sliding distance for a point on either sample has to be the same. This probably makes it a better arrangement for testing many materials, unless, of course, we wish deliberately to confine the majority of wear to one surface.

The "overlap parameter" (Czichos) is defined as the ratio of sliding distance for "body" divided by sliding distance for "counter body". For the thrust washer this is 1, for fretting tests it is close to 1, but for pin on disc tests it is variable, but is typically less than 0.05. The overlap parameter also applies for reciprocating tests, but here there is not the temptation to use the equivalent of different pin on disc track diameters, as one would sensibly keep the stroke the same and index the specimen plate sideways to run a fresh wear track.