Handbook of contact mechanics: exact solutions of axisymmetric contact problems

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Abstrak

This open access book contains a structured collection of complete solutions of all significant axially symmetric contact problems. It provides solutions for classical profiles such as the sphere, cone or flat cylindrical punch as well as a multitude of other technically relevant shapes, e.g. the truncated cone, the worn sphere, rough profiles, hollow cylinders, etc. Normal, tangential and torsional contacts with and without adhesion are examined. Elastically isotropic, transversally isotropic, viscoelastic and functionally graded media are addressed.

The solutions of the contact problems cover the relationships between the macroscopic quantities of force and displacement, the contact configuration as well as the stress and displacement fields at the surface and in some cases within the half-space medium. The solutions are obtained by the simplest available method-- usually involving the method of dimensionality reduction or approaches of reduction to the non-adhesive normal contact problem.