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- [2] M. Barnes, "Stresses in Solenoids", *J. Appl. Phys.*, 48(5) (2001) 2000-2008.
- [3] J. Jones, "Contact Mechanics", Cambridge University Press (Cambridge, UK) (2000), Ch.6, p.56.
- [4] Y. Lee, S.A. Korpela and R. Horne, "Structure of Multi-Cellular Natural Convection in a Tall Vertical Annulus", Proc. 7th International Heat Transfer Conference, U. Grigul et al., eds., Hemisphere (Washington DC), 2 (1982) 221-226.
- [5] M. Hashish, "Waterjet Technology Development", High Pressure Technology, PVP-Vol. 406 (2000), 135-140.
- [6] D.W. Watson, "Thermodynamic Analysis", ASME Paper No. 97-GT-288 (1997).
- [7] C.Y. Tung, "Evaporative Heat Transfer in the Contact Line of a Mixture", Ph.D. thesis, Rensselaer Polytechnic Institute, Troy, NY (1982).

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