Article Abstract

Title:	**A computational approach to the design of a cryogenic turbine blade profile**
Author(s):	Subrata Kr. Ghosh[1]*, R. K. Sahoo[2], Sunil K. Sarangi[2]
Address(es):	[1]* Indian School of Mines University, Dhanbad Jharkhand, India, [2]National Institute of Technology, Rourkela, Orissa, India *Corresponding author (e-mail: subratarec@yahoo.co.in)
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Abstract:	The present day cryogenic gas turbines are in high use as they meet the growing needs for low pressure cycles. This calls for improved methods of blade profile design. The present study is aimed at the design of the blade profile of mixed flow impellers with radial entry and axial discharge. In this paper, details of a computer code have been developed for designing such blade profile. The computational procedure developed describes the three-dimensional contours of the blades for the turbine wheel. The flow of fluid in a turbine blade passage depends on the length of the flow path and the curvature of such path. This has been given due weightage. Effect of some of the turbine operating and design parameters on the flow path and its curvature have been analyzed and presented. Optimum solution for some of the free parameters and angles between velocity components was found. On that basis, co-ordinates of this blade profile were computed. Although manufacturers design the blade profiles for their production, till date no academic literature is available for this purpose. The work may help researchers for further developmental work on this topic as well as the manufacturers of cryogenic expanders.
Keywords:	Radial turbine, Blade profile parameter, Meridional streamlength, Axial coordinate, Radial coordinate, Angular coordinate