



Screw Compressors: Mathematical Modelling and Performance Calculation

By Nikola Stosic, Ian Smith, Ahmed Kovacevic

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Although the principles of operation of helical screw machines, as compressors or expanders, have been well known for more than 100 years, it is only during the past 30 years that these machines have become widely used. The main reasons for the long period before they were adopted were their relatively poor efficiency and the high cost of manufacturing their rotors. Two main developments led to a solution to these difficulties. The first of these was the introduction of the asymmetric rotor profile in 1973. This reduced the blade-hole area, which was the main source of internal leakage by approximately 90%, and thereby raised the thermodynamic efficiency of these machines, to roughly the same level as that of traditional reciprocating compressors. The second was the introduction of precise thread milling machine tools at approximately the same time. This made it possible to manufacture items of complex shape, such as the rotors, both accurately and cheaply. From then on, as a result of their ever improving efficiencies, high reliability and compact form, screw compressors have taken an increasing share of the compressor market, especially in the fields of compressed air production, and refrigeration and air conditioning, and today, a substantial proportion of compressors manufactured for industry are of this type. Despite the now wide usage of screw compressors and the publication of many scientific papers on their development, only a handful of textbooks have been published to date, which give a rigorous exposition of the principles of their operation and none of these are in English.

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Editorial Review

From the Back Cover

The first part of "Screw Compressors" gives a review of recent developments in screw compressor design.

The second part presents a generalized mathematical definition of screw machine rotors and describes some well known lobe shapes in detail.

The third part treats the mathematical modelling of the thermodynamics and fluid mechanics of compression and expansion processes. This includes discussion of the issues addressed in order to be able to predict the optimum rotor size and speed and built-in volume ratio and, in the case of oil flooded machines, the injection position and jet diameter.

The fourth and fifth parts discuss the principles used and describe the application of the analytical procedures and rotor profiling techniques, presented in the earlier chapters, to the design of a number of twin screw compressors, currently manufactured including the examples of combining expansion and compression in the same machine.

Users Review

From reader reviews:

Mike Yerkes:

Spent a free time to be fun activity to do! A lot of people spent their sparetime with their family, or their particular friends. Usually they carrying out activity like watching television, likely to beach, or picnic inside park. They actually doing same task every week. Do you feel it? Would you like to something different to fill your free time/ holiday? Could be reading a book is usually option to fill your cost-free time/ holiday. The first thing you will ask may be what kinds of publication that you should read. If you want to attempt look for book, may be the e-book untitled Screw Compressors: Mathematical Modelling and Performance Calculation can be fine book to read. May be it may be best activity to you.

Deborah Ayers:

Why? Because this Screw Compressors: Mathematical Modelling and Performance Calculation is an unordinary book that the inside of the publication waiting for you to snap this but latter it will jolt you with the secret the item inside. Reading this book next to it was fantastic author who have write the book in such incredible way makes the content within easier to understand, entertaining way but still convey the meaning totally. So , it is good for you for not hesitating having this ever again or you going to regret it. This amazing book will give you a lot of rewards than the other book include such as help improving your skill and your critical thinking method. So , still want to hold off having that book? If I had been you I will go to the reserve store hurriedly.

Jerry Raminez:

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Edna Kissel:

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