ACADEMICIA: An International Multidisciplinary Research Journal
ISSN: 2249-7137 Vol. 11, Issue 12, December 2021 SJIF 2021 = 7.492
A peer reviewed journal

THERMAL ANALYSIS OF RECIPROCATING COMPRESSORS PARTS

Mahir Hussain*

*Assistant Professor,
Department of Mechanical Engineering, Faculty of Engineering,
Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, INDIA
Email id: mahir.engineering@tmu.ac.in

DOI: 10.5958/2249-7137.2021.02632.X

ABSTRACT

The paper provides a comprehensive examination of various approaches to thermal analysis of reciprocating compressors. It is generally known that a significant portion of the inefficiency in small reciprocating compressors used for residential refrigeration is due to thermal effects, which are primarily manifested as superheating. As a result, being able to tune the compressor's thermal behaviors is critical for increasing its efficiency. In fact, it is widely assumed that the effectiveness with which the thermal issue is addressed will have a significant impact on future compressor improvements. The purpose of this work is to provide an overview of the various computational and experimental approaches for compressor thermal design that are currently used in the industry. Each methodology is briefly described, along with prospective applications for compressor analysis, as well as its key benefits and limitations. Finally, some new information concerning recent developments in this field is shared. The purpose of this research is to determine the temperature distribution on the piston's upper surface. Because damaged or broken parts are so expensive to replace, it is predicted that the top surface of the piston will be damaged or broken owing to temperature weather during operation.

KEYWORDS: *Air Compressor, High-Pressure Cylinder, Thermal Analysis.*

REFERENCES:

1. H. Sixmith and H. Altmann, “A regenerative compressor.” 1976.
2. A. M. A. Soliman, S. H. Taher, A. K. Abdel-Rahman, and S. Ookawara, “Performance enhancement of vapor compression cycle using nano materials,” 2015, doi: 10.1109/ICRERA.2015.7418526.
3. J. G. Koomey, S. Berard, M. Sanchez, and H. Wong, “Implications of historical trends in the electrical efficiency of computing,” IEEE Ann. Hist. Comput., 2011, doi: 10.1109/MAHC.2010.28.
4. P. Zamparo, A. E. Minetti, and P. E. Di Prampero, “Mechanical efficiency of cycling with a new developed pedal-crank,” J. Biomech., 2002, doi: 10.1016/S0021-9290(02)00071-4.
5. Å. Jernqvist, K. Abrahamsson, and G. Aly, “On the efficiencies of absorption heat pumps,” Heat Recover. Syst. CHP, 1992, doi: 10.1016/0890-4332(92)90015-A.
6. R. Balasubramanian, “Superheating of liquid alkali metals,” Int. J. Thermophys., 2006, doi:

10.1007/s10765-006-0098-2.

7. SMITH CP, "THERMOCOUPLES," Eng Matls Des., 1969, doi: 10.1049/pbce033e_ch3.

8. R. D. Jackson and S. A. Taylor, "Heat transfer," in Methods of Soil Analysis, Part 1: Physical and Mineralogical Properties, Including Statistics of Measurement and Sampling, 2015.

9. O. V. Lobach and V. A. Gridchin, "Smart wireless heat flux sensor," 2015, doi: 10.1109/APEIE.2014.7040854.

10. R. Usamentiaga, P. Venegas, J. Guerediaga, L. Vega, J. Molleda, and F. G. Bulnes, "Infrared thermography for temperature measurement and non-destructive testing," Sensors (Switzerland). 2014, doi: 10.3390/s140712305.

11. M. Yang, "Air compressor efficiency in a Vietnamese enterprise," Energy Policy, 2009, doi: 10.1016/j.enpol.2009.02.019.