Patent Search

Invention Title	A BOILING SURFACE WITH ENGRAVED CONCENTRIC CIRCLES
Publication Number	13/2022
Publication Date	01/04/2022
Publication Type	INA
Application Number	202211014915
Application Filing Date	17/03/2022
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	MECHANICAL ENGINEERING
Classification (IPC)	F28F0013180000, F28D0015040000, C23C0024080000, H01L0023427000, F28F0001420000

Inventor

Name	Address	Country	Nation
Singh, Saurabh	DIT University, Mussorie- Diversion Road, P.O. Bhagwantpur, Dehradun, UTTARAKHAND-248009, INDIA	India	India
Kumar, Manoj	DIT University, Mussorie- Diversion Road, P.O. Bhagwantpur, Dehradun, UTTARAKHAND-248009, INDIA	India	India
Patil, Anil Kumar	DIT University, Mussorie- Diversion Road, P.O. Bhagwantpur, Dehradun, UTTARAKHAND-248009, INDIA	India	India

Applicant

Name	Address	Country	Nationali
DIT University	Mussorie- Diversion Road, P.O. Bhagwantpur, Dehradun, UTTARAKHAND-248009, INDIA	India	India

Abstract:

The present invention discloses a boiling surface with engraved concentric circles on a circular disk-shaped metal surface namely aluminium surface to enhance the boilin flux and heat transfer coefficient for boiling of water at atmospheric pressure. The roughness in the form of engraved concentric circles improves the capillary wicking abil the liquid-solid interface, increases the active nucleation sites, accelerates the bubble departure, and thus enhances the evaporation rate. The pitch ratio and indentation r concentric circles on a circular aluminium disc are varied to examine the effect of surface roughness on pool boiling heat transfer. The boiling trends are observed by usin plots of boiling heat transfer coefficient and boiling heat flux as a function of excess temperature. The highest boiling heat transfer coefficient is 0.66 MW/m2K for the boil surface having a pitch ratio of 0.0125 and an indentation ratio of 0.008 and the maximum heat transfer coefficient is 21.11% higher than that of the plain surface for the b surface having a pitch ratio of 0.0125 and an indentation ratio of 0.008.

<u>Complete Specification</u>

The present invention relates generally to boiling surfaces, and more specifically, to a boiling surface with engraved concentric circles on a circular disk-shaped metal surface to enhance the boiling heat flux and heat transfer coefficient for boiling water at atmospheric pressure.
BACKGROUND OF THE INVENTION
[0002] The pool boiling has been extensively studied for its high ability of heat dissipation closed to the saturation temperature of the boiling fluid. The boiling heat flux i mainly increased by three techniques, namely, by working on the surface, selection of working fluid and using external energy sources. Continuous improvements in the boiling performance were recorded in the last few decades by improving the surface texture, surface characteristics, and surface structure.
[0003] In the literature, the effect of different types of surface roughness geometries and patterns on the pool boiling heat transfer has been investigated. Kang M. investigated the effect of surface roughness in pool boiling of water at atmospheric pressure. The rough surface showed a better heat transfer rate than a plain surface. Godinez et al. performed an experiment on the aluminium surface with a high temperature conductive microporous coating. The microporous coating surface showed a critical heat flux of 1.85 MW/m2 due to higher wettability caused by the boehmite oxidation layer. Zhong et al. studied the effect of the downward-facing pin fin surface i the boiling of purified water. A considerable enhancement in the critical heat flux was noticed with the increase of the inclination angle of pin fins. Cao et al. studied the effect of pin fin surface with nanoparticles deposition in the boiling of FC72 liquid. The results showed that the aligned pin-fin empty area showed better heat transfer compared to the staggered pin fins due to less hydraulic resistance which supports higher capillary pressure for the liquid supply. Dehshali et al. reported in an experimental investigation that the twisted tape fins on the boiling surface enhanced the heat transfer rate owing to the quicker bubble withdrawal and flow mixing of liquid. Kumar et al. investigated in a study that the hydrophobic polymer printed plain copper surface brings out higher heat transfer than that of a plain surface as a res

View Application Status

Terms & conditions (http://ipindia.gov.in/terms-conditions.htm) Privacy Policy (http://ipindia.gov.in/privacy-policy.htm)
Copyright (http://ipindia.gov.in/copyright.htm) Hyperlinking Policy (http://ipindia.gov.in/hyperlinking-policy.htm)
Accessibility (http://ipindia.gov.in/accessibility.htm) Archive (http://ipindia.gov.in/archive.htm) Contact Us (http://ipindia.gov.in/contact-us.htm)
Help (http://ipindia.gov.in/help.htm)

Content Owned, updated and maintained by Intellectual Property India, All Rights Reserved.

Page last updated on: 26/06/2019