Vacuum Technology
Room: Hall D - Session VT-TuP

Vacuum Technology Division Poster Session and Student Poster Contest

VT-TuP2 Performance Evaluation of Scroll Pump, ***Fan-Chun Hsieh***, *P.H. Lin, C.S. Yu, F.Z. Chen*, National Applied Research Laboratories, Taiwan

Scroll pumps are widely used in solar-optic and semiconductor industry for backing purpose. The performance of scroll pump could affect the operation of production line significantly. Here, we compared the performance of scroll pump before and after maintenance. The ultimate pressure and acceleration were measured. The ultimate pressure decreases slightly from $5x10^{-1}$ Torr to $2x10^{-2}$ Torr. The RMS magnitude of acceleration shows a maximum peak which occurs at about 30 Hz. Moreover, small peaks were also observed in the spectrum. The small peaks were high before maintenance compared to after maintenance. We speculated that this trend is due to the damage of ball bearing and wear of tip seal. The proposed measurements provide a considerable advancement in maintenance of pump.

VT-TuP3 Reliability Engineering Study of TMPs and Cryopumps, ***JongYeon Lim***, *K.M. Choi, K.M. Baik*, Korea Research Institute of Standards and Science, Republic of Korea, *S.Y. In*, Korea Atomic Energy Research Institute, Republic of Korea, *S.K. Lim*, National Nano Fab Center, Republic of Korea, *D.Y. Koh*, Korea Institute of Machinery and Materials, Republic of Korea, *W.S. Cheung*, Korea Research Institute of Standards and Science, Republic of Korea

Methods of the characteristics evaluation of vacuum pumps are well-defined in the international measurement standards such as ISO, PNEUROP, DIN, JIS, and AVS. HV pumps such as TMPs and cryo-pumps, essential equipment in the advanced industry, require very objective engineering reliability for ascertaining their performance estimation.

Developmental effort for establishing reliability engineering evaluation infra-structure of TMPs and cryo-pumps has been conducted in the manner of component level test, characteristics evaluation and field tests in KRISS.

Until now reliability study for vacuum pumps is not well developed since there are so many unknown factors are prevailing in vacuum industry. However, the increasing needs for the reliability engineering in real field are continuously rising. In this reason we have currently developed the partial reliability engineering evaluation system of high vacuum pumps. In the case of TMPs and cry-pumps, we shortly try to remark the developmental flow of reliability chain in the fields as follows;

TMPs:

1. Characteristics evaluation – pumping speed, ultimate pressure, etc.

2. Endurance evaluation – Continuous starting and stopping operation (10 % to 90 % RPM)

3. Field Test – NNFC Etcher system

4. Quality assurance evaluation – magnetic field tolerance valuation system

5. Destructive test,

Cryo-pumps:

1. Component evaluation – Refrigerator evaluation

2. Characteristics evaluation – pumping speed, ultimate pressure, etc.

3. Field Test – NNFC Sputter system

4. Quality assurance evaluation .

In this presentation we suggest the methodological approach to the completion of high vacuum pump development through a reliability engineering study

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VT-TuP4 Improved Threshold Ionisation Mass Spectrometry, *D.L. Seymour, S. Davies*, ***Alan Rees***, *P. Hatton*, Hiden Analytical, UK

Threshold ionisation mass spectrometry (TIMS) is well established as a technique for improving on standard methods of residual gas analysis, particularly when the dominant peaks in the mass spectrum occur at very nearly the same mass/charge ratio. The mass peaks are then difficult to separate using standard quadrupole mass spectrometric methods. We have described elsewhere several applications in which TIMS has proved to be very effective. More recently, we have examined ways in which the interpretation of TIMS measurements can be improved by fitting to the experimental data trend lines calculated from theoretical expressions.

VT-TuP5 The XHV Cathode Preparation System of the "High Current High Polarization" Electron Gun for the Proposed eRHIC Project., ***Omer Rahman***, *I. Ben-Zvi, E. Wang, T. Rao, J. Skaritka*, Brookhaven National Laboratory

A very compact cathode preparation chamber for the high current high polarization gun for the proposed Erhic project has been designed and assembled at the Brookhaven National Laboratory. This preparation chamber is used to prepare GaAs cathodes to be used to extract electron beam in the multi-cathode gun. Preparation of GaAs strictly requires XHV environment and this system is able to achieve that in a consistent way. In this paper, the construction of the vacuum system including different components, the procedure and pressure results over more than a year of study will be discussed.

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