

4. 겹판스프링댐퍼의 감쇠는 측면틈새가 작을수록 증가하며, 수직방향의 성분이 수평방향의 성분보다 더 큰 값을 가진다.
5. 겹판스프링댐퍼의 감쇠는 가진속도에 따라 감소하는 경향을 띤다.
6. 겹판스프링댐퍼의 감쇠는 오일의 점도가 클수록 높음을 알 수 있다.
7. 향후 연구과제로서 댐퍼 내부의 캐비테이션 발생이 댐퍼의 동특성에 미치는 영향에 관한 고찰과 더불어 이에 대한 댐퍼의 성능에 대한 연구와 캐비테이션 방지에 대한 설계 기법이 요구된다.

44. Vehicle Control and Performance Analysis of 4WS Passenger Cars using Robust Control Techniques

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In this dissertation, a lateral control design is presented for automatic steering of active four-wheel steering (4WS) vehicles for highway driving. The linearized two degree-of freedom (2 DOF) equations for the lateral dynamics are derived using the Newton's equations. A robust controller using μ -analysis synthesis is designed for a linear model of a passenger cars moving a given path. The performance of the robust controller is then evaluated using simulation studies.

It is shown that the presented control method possesses the inherent advantages that are robust to complex uncertainty for typical driving maneuvers. Finally, the active 4WS vehicle achieves good performance for a wide range of uncertainty in the highway operating conditions.

45. Measurement of Diffuser Pump Flow Field by PIV

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The Present Experimental study is focused on the application of multi-point simultaneous measurement by PIV(Particle Image Velocimetry) to rotor-stator region within centrifugal turbine pump. Six different kinds of rpm(1000, 1500, 2000 and 2500) are selected as experimental condition. Optimized cross correlation identification to obtain velocity vectors is implemented by direct calculation of correlation coefficients. Fine optical setup deeply concerned with PIV performance is arranged for accurate PIV measurement of high-speed complex flow. A CCD camera which is synchronized with pulse generator was used to acquire clear original particle images at 1000, 1500, and 2000rpm. Image Intensifier CCD Camera was also arranged to cope

with illumination problem at 2500rpm. The velocity distribution, velocity profile, kinetic energy and vorticity distribution at two different kinds of impeller blade orientation(62°, 81°), each averaged from 25 instantaneous data, are represented quantitatively at the rotor and stator interaction region.

46. A Study on the Development of Cathode-Ray Tube Die using Hot Forging

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By the development of computer and television, the demand of cathode-ray tube(CRT) is increasing gradually. The size of cathode-ray tube also has a tendency to be bigger over 20 inches. The CRT is required very clean surface and curvature because of quality of picture area.

The CRT is manufactured from semi-liquid glass which deformed and cooled down by die sets, plunger and bottom. In general, these die sets produced by casting process. It is very difficult to avoid structural defects, such as segregations and inclusions, and reduce weight of dies by the casting, specially when manufacturing large dies. Therefore these defects make micro-spots on the surface of the CRT.

But forging product as compared with casting product is able to extend the life of dies and obtain sound product. In this study, it is aim to develop the process of manufacturing cathode-ray tube by hot forging, to get very clean surface of the CRT and extend die life. A important component at forging process is to design the preform(initial workpiece) and to determine the capacity of required press in forging process.

So, the experiment using a model material and the numerical simulation using a rigid-plastic finite element method(FEM) were applied to know forging load and formability and so on. But the volume of predicted preform in two-dimension FEM is smaller than that of actual product. Therefore three-dimension FEM was applied to design the preform.

The similarity method using plasticine is successfully performed. The predicted forging loads by similarity method are good agreement with those of 3-dimensional simulation deviation of maximum 30% in die velocity of range 10-500mm/s. The optimal preform determined by model experiment is analyzed in detail by 3-dimensional FEM. The simulation is successfully carried out with isothermal and non-isothermal conditions. The results of isothermal and non-isothermal conditions are almost same because the die velocity of 500mm/s is very fast and contact time is very short.

And the integrated die, to combine the kind of dies with similar size, is suggested and simulated to save the manufacturing cost of dies. For example, forming process was developed to combine a plunger of 17 inches with a bottom of 19 inches by 3-dimensional FEM after making a forging draft.