

공차를 고려한 사이클로이드 감속기의 해석

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Analysis of the Cycloid Drive with Tolerances

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Key Words: Cycloid drive(사이클로이드 감속기), Tolerance(공차), Torsional Stiffness(비틀림 강성), Backlash(백래쉬), Hertz contact theory(Hertz 접촉이론)

Abstract : The cycloid drive is generally known to have high stiffness and precision because of its multi-point contact between the disk and pin rollers. If there are tolerances for assembly and all pin rollers of the cycloid drive don't contact the disk, the backlash exists and the torsional stiffness is lower than the ideal case. In this paper, we analyzed the cycloid drive considering the tolerances. The lead/lag angles for contact of each pin roller and the backlash are calculated kinematically. These values are approximately calculated using moment-arm length from center to the contact point. Furthermore, the torsional stiffness of the cycloid disk is iteratively calculated based on the Hertz contact theory considering the number of contact pin rollers. As a result, the torsional stiffness of cycloid disk is still much larger than that of the bearings which supports the eccentric shaft.

사용후핵연료봉의 반자동 slitting 장치

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Semi-automatic Slitting Device of the Spent Nuclear Fuel Rods

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Key Words : Slitting Machine(슬리팅 기계), Spent Fuel Rods(사용후핵연료봉), Pellet and Hull(펠릿과 핵), Hot Cell(핫셀), Automatic Process(자동화 공정)

Abstract : We have developed a slitting machine which separates the UO₂ pellets from the fuel rod clad by slitting the 25cm long rod-cut. Since the device will be operated in a intense radiation field, the device should be radiation-tolerant, remotely operable and maintainable. Also the throughput of the device should be fast enough so that it can meet the requirements of the overall process. We introduced new design of the slitting device while considering these concerns. New design includes the semi-automation of the loading-unloading process of the rod-cut, the automatic separation of the pellets and clad, and remote operability and maintainability, etc. The performance of the slitting device was tested by using the simulated fuel rod-cut. Test results showed that over 95 % of fuel rods were successfully separated and over 40 % of the operation time was reduced.