

폴리프로필렌의 온도에 따른 동적인장특성 평가

김진성[†](한국과학기술원) · 허훈*(한국과학기술원) · 이강욱**(현대모비스) ·
하대을**(현대모비스) · 여태정**(현대모비스) · 박순조**(현대모비스)

Evaluation of Dynamic Tensile Characteristics of Polypropylene with Temperature Variation

Jin Sung Kim, Hoon Huh, Kang Wook Lee, Dae Yul Ha, Tae Jung Yeo and Soon Jo Park

Key Words: Dynamic tensile test(동적인장시험), Polypropylene(폴리프로필렌), Temperature(온도), True stress(진응력), True strain(진변형률), Heat Aging(열적노화).

Abstract : This paper deals with dynamic tensile characteristics for the polypropylene used in an IP(Instrument Panel). The dynamic tensile characteristics are important because the PAB module undergoes high speed deformation during the airbag expansion. The dynamic tensile tests are performed at the low temperature(30°C), room temperature(21°C) and high temperature(85°C). The tensile tests are carried out at strain rates of six intervals ranged from 0.001/sec to 100/sec. Tensile tests of polymers are rather tricky since polymer does not elongate uniformly right after the onset of yielding unlike the conventional steel. A new method is suggested to get the stress-strain curve accurately. The optimization method produced a good stress-strain curves which is in good coincidence with the stress-strain curve obtained from the experiment.

열, 전기, 기계 하중을 고려한 지그재그 고차 복합재 셸 이론

오진호[†](서울대) · 조맹효**(서울대)

Higher Order Zig-zag Shell Theory for Composite Shell under Thermo-Electric-Mechanical Loading

Jinho Oh, Maenghyo Cho

Key Words: Zig-zag shell theory(지그재그 셸이론); General tensor formulation(일반 텐서 정식화); Smart structure(지능 구조물);

Abstract : A higher order zig-zag shell theory based on general tensor formulation is developed to refine the predictions of the mechanical, thermal, and electric behaviors. All the complicated curvatures of surface including twisting curvatures can be described in a geometrically exact manner in the present shell theory because the present theory is based on geometrically exact surface representation. The in-surface displacement fields are constructed by superimposing linear zig-zag field to the smooth globally cubic varying field through the thickness. Smooth parabolic distribution through the thickness is assumed in the out-of-plane displacement in order to consider transverse normal deformation and stress.