alloy used Ti powder were more than 300 MPa and 5%, respectively. On the other hand, the tensile strength of the alloy used TiH₂ powder were more than 300 MPa, but the elongation of the alloy was about 2% and showed no yielding tendency even after shape memory treatment. The width between the transformation start and finish temperature of the alloy used TiH₂ powder becomes narrower. This means that the temperature-response improved by using of TiH₂ powder.

P21: TIG and YAG-Laser Hybrid Welder for Tailored High Strength Steel Sheet
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Tailored blanks (TBs) and high strength steel, called "Haiten," are key technologies in the development of lighter panel parts for automobiles. However, the material around the heat-affected zone (HAZ) tends to be weaker than other parts of the high-strength steel because of the slow cooling rate in TIG welding. The weakened area could become the cause of fracture in the next deep-drawing process. The laser welder provides an effective solution to this problem, due to its high power density and the fact that a small molten spot has a faster cooling rate. However, the laser process does not allow for a wide gap between welded parts because of its small molten spot. This has been a barrier to the realization of free-curve or multi-linear weld-lines in TBs of high-strength steel. In this paper, the authors describe a hybrid welder using TIG and YAG-lasers, allowing the TBs to accept a wider gap between the welded parts and preventing the materials around the HAZ from weakening. They report on the gap allowance and on the quality of the HAZ in high-strength steel.

P22: Development of a Palmtop Fatigue Testing Machine and the Characteristic Behavior of Microfabricated Thin Films
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One of the most promising micromanufacturing process for MEMS parts is LIGA (Lithography and Electroforming) process. The LIGA process provides a wide latitude in designing geometries of microstructures, but the process is characterized by producing both the material itself and MEMS structure at the same time. Since, the mechanical properties of electroformed material such as Ni depended on the process condition. We newly developed a palmtop fatigue testing machine. The machine enables in-situ observation with a scanning electron microscope or optical microscope and facilities both static and dynamic loading mechanisms, since a tensile strength and a fatigue strength are obtained. A voice coil motor is used as the loading mechanism and is supported by parallel plate springs. The displacement of the moving coil is measured with a linear voltage differential transformer (LVDT) installed in the loading unit. Tensile load is measure with a load cell and at same time calculated using both the coil current and the displacement. Ni-specimen was fabricated by UV-LIGA (Ultra Violet ray Lithography) process and the thickness is 5, 10 and micrometers and the fatigue strength is about 35% of the tensile strength.

P23: Bonding of Magnesium Composite Material Using Superplastic Deformation
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Although the magnesium alloy with the excellent characters attracts attention as a next-generation metal, it is important to improve the corrosion-resistant due to stand sweat use condition and to widely extend the implicated demand. Just until now, conversion treatment, anodic oxidation, and paint processing are used for magnesium alloy. But, the