Real-Time Predictive Modeling of Wood Composite Products Utilizing the Data Warehouse of Manufacturing Facilities

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Wood composite and engineered panel manufacturers store large amounts of process data in data-warehouses. Destructive panel strength tests are performed at periodic intervals during the production runs to assess conformance of product properties. The linkage between process data and destructive test data is antipodal in most instances and knowledge gaps exist for operations personnel. The proper 'fusion' of destructive test data with real-time process data creates a database foundation for real-time predictive modeling using statistical and non-statistical methods. The study presents successful case studies of real-time predictive modeling systems at wood composite and engineered panel mill test sites. Statistical algorithms predicted strength of materials (e.g., IB, MOR, EI, etc.) within 10% of actual test values at mill test sites. Real-time predictions of strength of materials may prevent the manufacture of failing panels and may also reduce unnecessary high operational targets (e.g., density, resin, etc.) given improved knowledge of the process. Important variables in statistical models may also improve root-cause investigations of sources of product and process variation.