

## ■ 연구논문 요약문1

논문제목	Lot-sizing and scheduling in flat-panel display manufacturing process
게재정보	Omega, 온라인게재, 2019
개요	<p>This study considers a lot-sizing and scheduling problem arising in the real-world flat-panel display industry. This problem is formulated as a variant of the discrete lot-sizing and scheduling problem with a sequence-dependent setup. After describing the characteristics of the problem and analyzing its computational complexity, we propose an extended formulation based on a network structure. Even though the problem is NP-hard in general, we show that there exist special cases solvable in polynomial time. For the general cases, we demonstrate the tightness of the extended formulation by means of both polyhedral analysis and computational experiments with artificially generated data and real-world industry data. We also propose a relax-and-fix heuristic algorithm based on the extended formulation, which has been deployed in practice, with the corresponding computational results.</p>
연구결과	<ul style="list-style-type: none"> <li>- We introduce a lot-sizing and scheduling problem that occurs in a real-world high-technology flat-panel display manufacturing industry. We define the problem as DLSPSM and propose a standard mathematical formulation based on DLSP.</li> <li>- We show that DLSPSM is NP-hard and provide some special cases where it is polynomially solvable.</li> <li>- As a major contribution of the paper, we propose an extended formulation for DLSPSM based on a network structure. We verify, by both theoretical analysis and computational experiments, that the extended formulation has considerable advantages over the standard formulation. We also devise a relax-and-fix heuristic algorithm for DLSPSM. The results of the computational test show that the algorithm is comparable to an algorithm provided by a commercial MIP solver.</li> </ul>
활용분야 및 기대효과	<ul style="list-style-type: none"> <li>- The results can be directly applied to the production planning and scheduling in real-world flat panel manufacturing industry and the related high-tech industry.</li> <li>- The results can also be applied to study the general lot-sizing and scheduling problems with sequence-dependent setups.</li> </ul>