

## **Lean 4.0 tool - How to build dynamic cybernetic tools for Polymeric Products at Industry 4.0 System**

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**Abstract.** In the polymer products industry, new technologies and Industry 4.0 concepts represent real and attractive solutions to increase efficiency and profitability through creating the intelligent and adaptable manufacturing system required by globalized economic system. At the same time, the existing manufacturing systems have made sustained efforts to implement Lean principles, techniques and tools, this model providing concrete solutions to achieve process efficiency by eliminating waste and continuously improving performance. The production system architecture consists of active production resources, which participate directly in the production process flow, and passive elements, which have a supporting role. In Industry 4.0 environment, these elements form a dynamic cyber-physical production subsystem, through which different manufacturing solutions can be managed, corresponding to different products that are in different stages of manufacturing. Updating Lean production systems to Industry 4.0 level is increasingly engage engineers and researchers through their efforts to achieve an intelligent and adaptable production system. Lean Manufacturing 4.0 is obtained by implementing Lean tools in the cyber-physical system through active and passive production resources administration shells and creating a cybernetic structure capable of applying Lean principles to both manufacturing cells and production processes. This work presents the results of research on transforming a Lean instrument a into a Lean 4.0 solution, applicable to manufacturing cells processes, in an Industry 4.0 polymer products manufacturing system.

**Keywords:** polymeric products; Lean 4.0; Industry 4.0; production process; efficiency.