

**Research on optimizing of the Failure Mode and Effects Analysis
using advanced Expert Systems**

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Abstract.

Failure Mode and Effects Analysis (FMEA) is one of the most advanced and effective methods of preventing defects, by controlling the risks in design and manufacturing / process, with an effect in improving product quality and reliability.

By analyzing the product at all stages - design, execution, commissioning and operation - potential defects, their effects, causes, corrective and preventive actions can be identified. The analysis is done at the level of the product and / or process components, starting from their function within the assembly.

Modern FMEA procedures represent a new approach, in seven steps, for documenting technical risks, in order to achieve a more transparent process of design and execution of a new product. By using it in a correct and consistent way, FMEA allows the timely identification and avoidance of quality problems.

As a result of the interdisciplinary approach in making a product, in order to perform a complete analysis, it is necessary to establish a team of experts in each field who participate in making the product (design, manufacture, assembly, commissioning, etc.).

Beyond the indisputable its advantages, FMEA also presents a series of disadvantages due to the rather complicated formalism that it imposes and the direct presence of experts.

In order to eliminate the deficiencies presented above, the paper presents the results of research on the development of an advanced expert system on optimizing the Failure Mode and Effects Analysis. The application of research in the engineering of polymeric and composite products is being considered.