

DESIGN OF PROFICIENCY TEST ITEMS BY 3D PRINTING TECHNOLOGY

Pedro Mosquera Naveira and Natalia Crespo González

Galician Laboratory of Consumer Products (LCG).
Torres Quevedo3. 15008 A Coruña, Spain.

INTRODUCTION

The Galician Laboratory of consumer products (LCG) belongs to the regional government of Galicia in Spain. Its functions include market surveillance aimed for consumer protection, particularly conducted to the more vulnerable persons such as the children under 36 months. In order to check the safety requirements which are related with their mechanical and physical properties, toys have to be tested according the EN 71-1 standard and the childcare articles have to comply with the EN 12586 standard, among others. With the purpose of ensuring the technical competence in this field, a proficiency testing scheme was provided by the LCG.

TEST ITEMS

LCG organized a proficiency test taking into account the requirements set by ISO 17043. Instead of buying commercially available batches containing defective and inhomogeneous test items, LCG decided to produce them using the 3D printing technology. This innovative approach guaranteed the production of homogeneous and stable test items by controlling the whole manufacturing process. In the design phase of the pieces, several parameters were taking into account, such as the material used, the shape or the structure of the pieces. The process was then optimised to reduce the costs and time of production.

Once the pieces were designed, optimized and produced in the LCG, their homogeneity and stability was assessed according the ISO/IEC 17043 standard and the study was carried out following the procedures established in the ISO 13528 standard. The results obtained were documented and included in the final report of the proficiency testing scheme.

PROFICIENCY TESTING SCHEME

The LCG distributed 9 proficiency test items to 5 participating laboratories from 2 countries. The toy tests conducted were impact test (A), cylinder for small parts (B), geometric shape of certain toys (C), soaking test (D) and drop test (E). The length of the cords of the soother holder (F) was studied in the childcare item supplied. Finally, the reported results were statistically evaluated according ISO 13528 to assess the performance of each participating laboratory.

