Results of an industrial survey on the use of surface texture parameters

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Abstract In 1999, CIRP conducted an industrial survey of the use of surface texture parameters [1]. In the seventeen years since, much has changed, with the most important advancement being the introduction of areal surface texture parameters as described in ISO 25178-2 [2]. There has also been the release of commercial software packages for the calculation of surface texture parameters and, therefore, it is expected that industry is starting to embrace areal surface texture characterisation. Industry is also increasingly using more optical instruments, which are often inherently areal in nature. These factors bring to light the need for a new parameter survey, to investigate whether industry really has been adopting areal surface texture parameters. This study used an online survey to obtain information about the current use of surface texture parameters in industry. The survey features both profile and areal surface texture parameters defined in specification standards ISO 4287 [3], ISO 25178-2 [2], ISO 12085 [4] and ISO 13565-2/3 [5, 6]. The survey was open to responses for eight months and obtained a total of 179 responses from a variety of industrial users of surface texture parameters spread across thirty-two countries. Responses from the survey offer information about the usage of individual surface texture parameters, highlighting any parameters that are unpopular and may require attention. The survey also enables participants to share their opinion on the current range of parameters in use, giving an insight into the perception of surface texture parameters in industry. The results from the survey highlight a strong adoption by industry of the areal surface texture parameters defined in ISO 25178-2. In comparison to the 1999 survey, there has also been an overall increase in the use of profile surface texture parameters, and an increase in the variety of parameters used, particularly for the ISO 4287 roughness parameters, suggesting a better understanding of the range of parameters available and their uses. Conversely, this increase in parameter variety could be due to the greater computational power available to users of surface texture parameters, allowing them to use more parameters with little cost. The results of the surface texture parameter survey will serve as an indication of the current state of the industry to those interested in the widespread acceptance and evolution of surface texture parameters. The analysis of the survey will identify common potential improvement areas in surface texture parameter selection and provide a starting point from which to better promote the current selection and better educate the users.

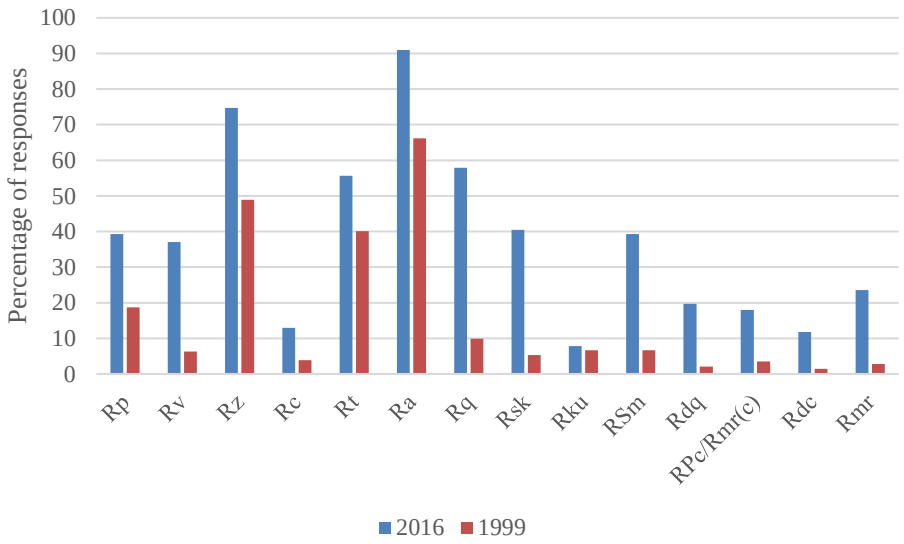

Figure 1. Survey responses for the use of ISO 4287 roughness surface texture parameters compared to the responses of the 1999 survey. Results are given as a percentage of the total number of responses for the survey.

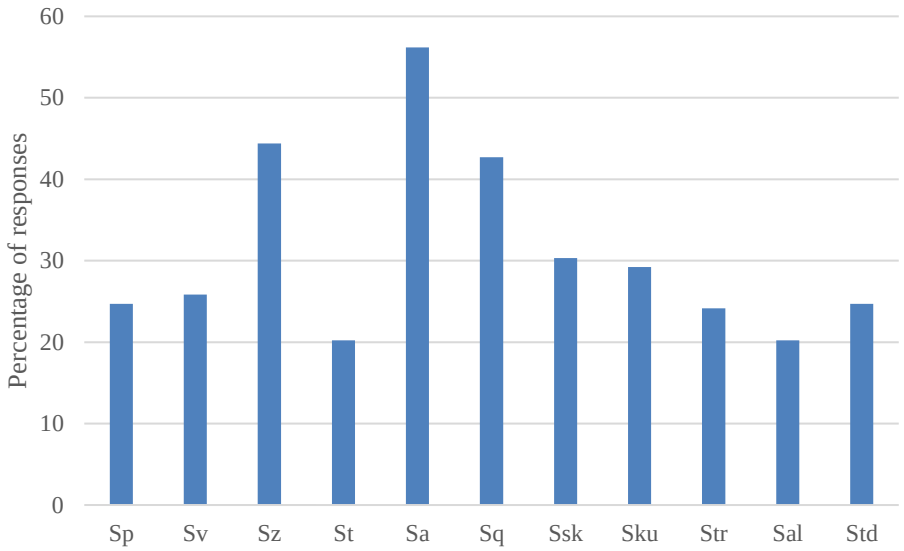

Figure 2. Survey responses for the use of ISO 25178-2 areal surface texture field parameters. Results are given as a percentage of the total number of responses for the survey.

Main References

[1] De Chiffre L 1999 Industrial survey on ISO surface texture parameters *Ann. CIRP* **48** 74–7
[2] ISO 2012 25172-2:2012 - Geometrical product specification (GPS) - Surface texture: Areal Part 2: Terms, definitions and surface texture parameters (International Organization for Standardization)
[3] ISO 1998 4287:1998 - Geometrical product specification (GPS) - Surface texture: Profile method - Terms, definitions and surface texture parameters (International Organization for Standardization)
[4] ISO 1997 12085:1997 - Geometric product specification (GPS) - Surface texture: Profile method - Motif parameters (International Organization for Standardization)
[5] ISO 1997 13565-2:1997 - Geometric product specification (GPS) - Surface texture: Profile method - Surfaces having stratified functional properties (International Organization for Standardization)
[6] ISO 2000 13565-3:2000 - Geometrical product specification (GPS) - Surface texture: Profile method - Surfaces having stratified functional properties - Part 3: Height characterization using the material probability curve (International Organization for Standardization)