

Industrial survey of ISO surface texture parameters

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Survey details

This study used an on-line based survey to obtain information from voluntary respondents about the surface texture parameters that they use. The survey included parameters from ISO 4287, ISO 12085, ISO 13562-2, ISO 13565-3 and areal parameters from ISO 25178-2. This survey serves as an update to a similar survey performed in 1999 by De Chiffre.

The survey was open to responses for eight months, from March 2016 to November 2016, and obtained a total of 179 responses from a variety of industrial users spread internationally across thirty-four countries. The responses come from a variety of disciplines and countries, and serve as a viable sample from which to learn about current surface texture parameter use, delivering a useful update to the original 1999 survey.

Participant details

Figure 1 shows the survey responses sector split. The most responses for this survey came from research institutions. Several of the sectors here are comprised of only a few participants, such as 'tribology', and as such are poorly represented.

The majority of responses came from large companies with over 250 employees, as shown in figure 2. This is in contrast to the 1999 survey, in which medium-sized companies were most popular, with 45%.

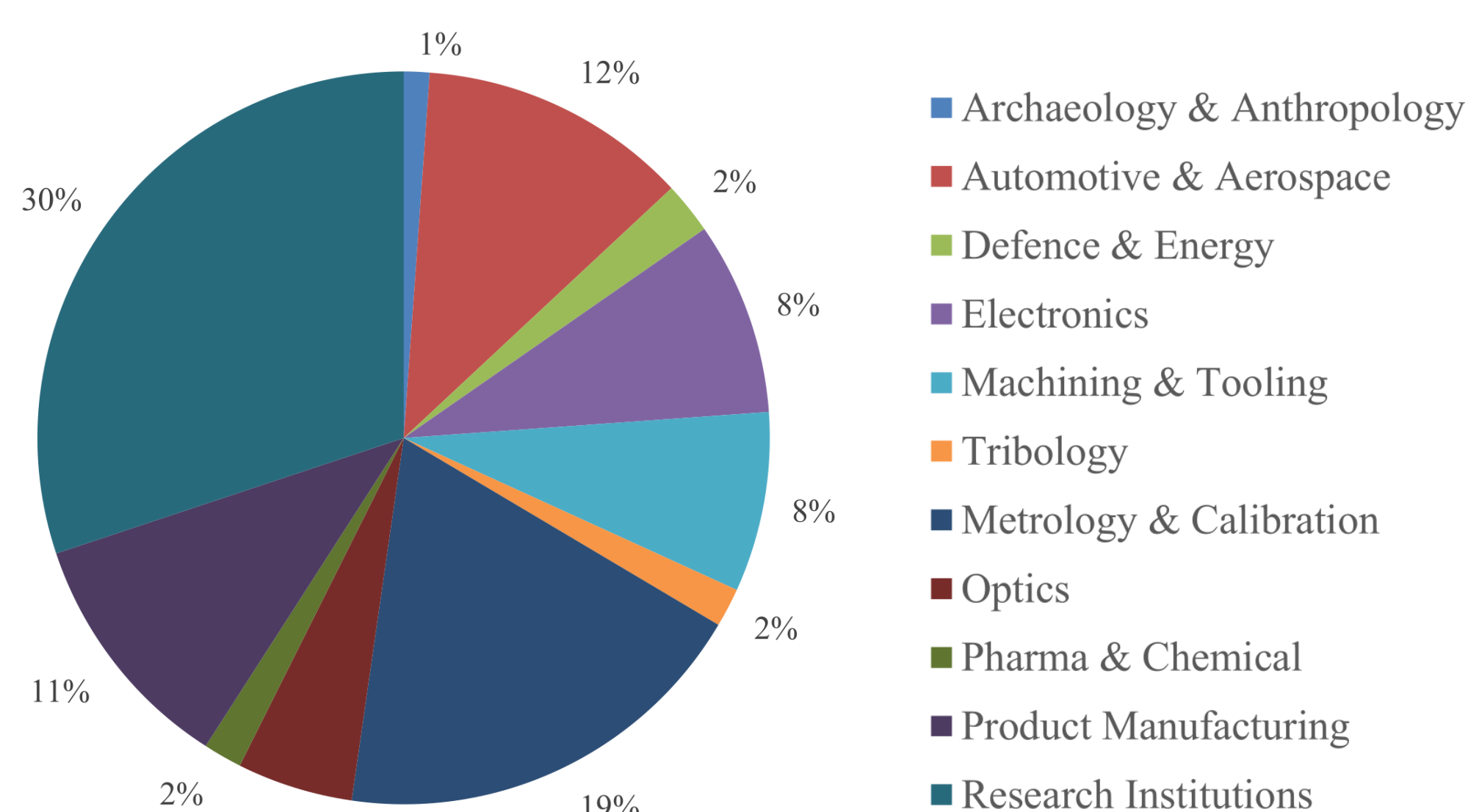


Figure 1. Industry sectors represented in the survey as a percentage of total number of responses

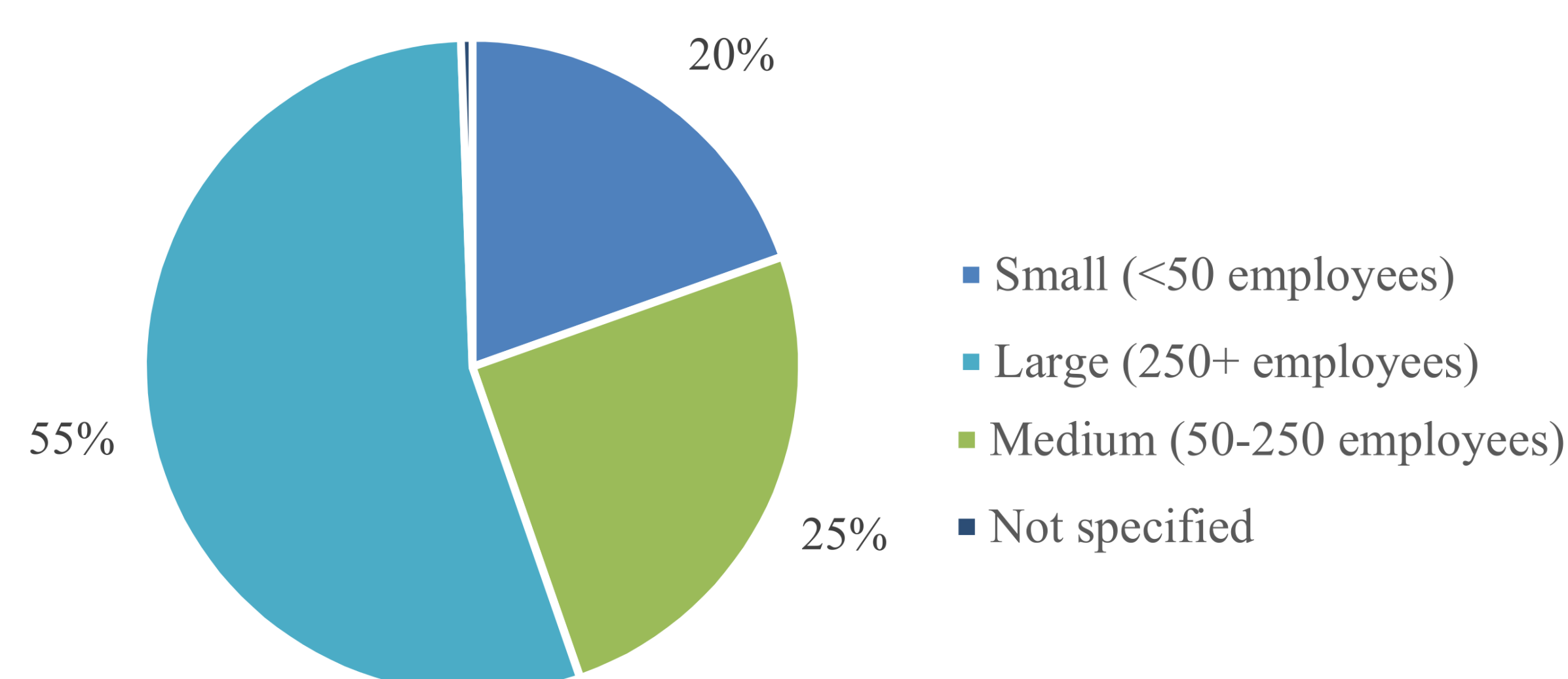


Figure 2. Percentage of responses to the survey with a given company size.

Survey results

The most immediate conclusion to draw from the results in figure 3 is the unanimous increase in parameter usage across all parameters. The *Ra* parameter remains the most popular parameter used, however, since 1999 a significant relative increase is seen for the less well-known parameters, such as skewness and kurtosis parameters *Xsk* and *Xku*.

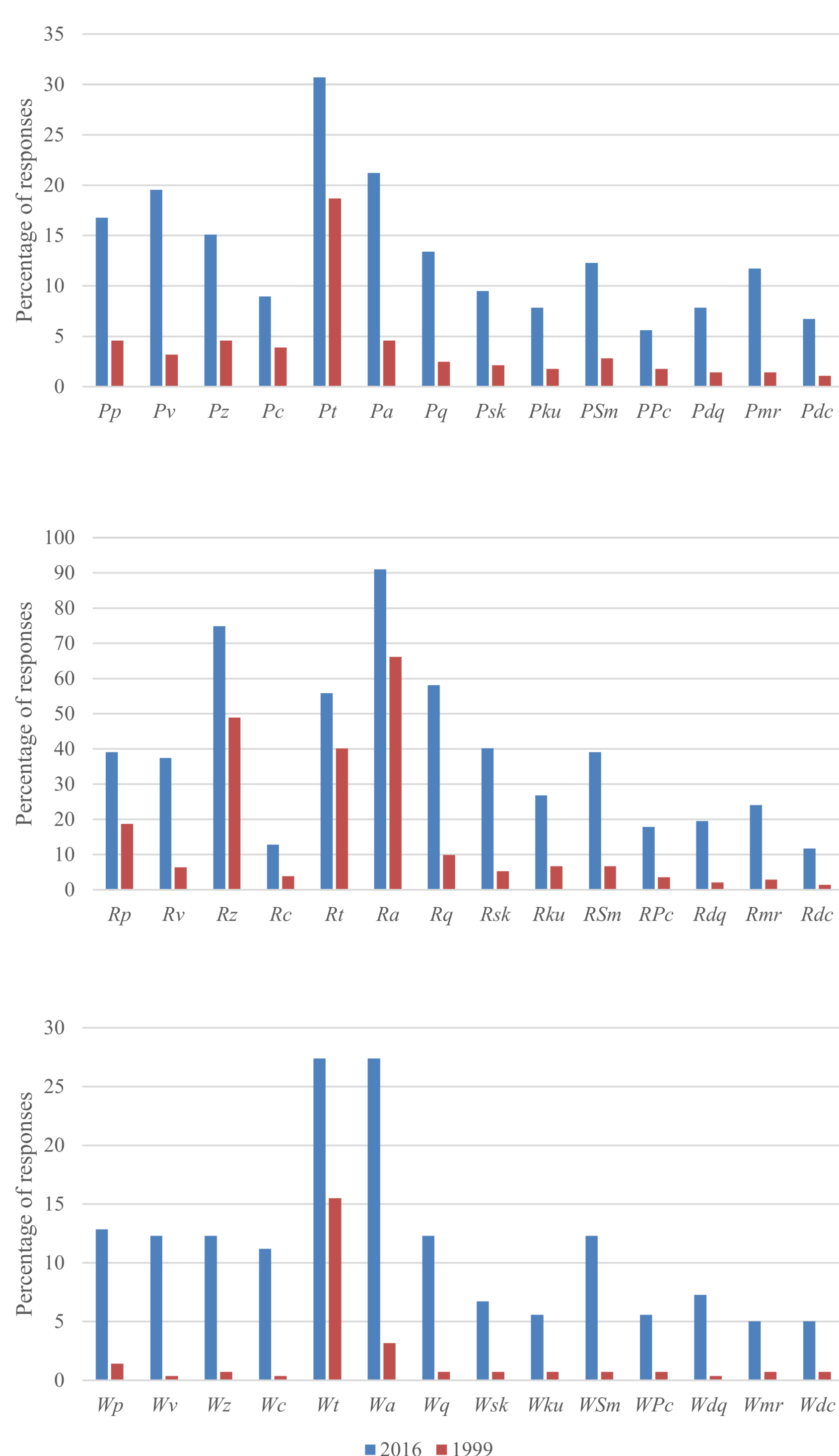


Figure 3. ISO 4287 parameters usage Top: primary parameters, Middle: roughness parameters, Bottom: waviness parameters

Field parameters share the greatest similarity with the ISO 4287 profile parameters, and so it is unsurprising that these have seen the largest uptake by industry. Feature parameters introduce a new type of surface analysis with no real parallel in the profile world. As a result, these are the least used of the three categories of areal surface parameters.

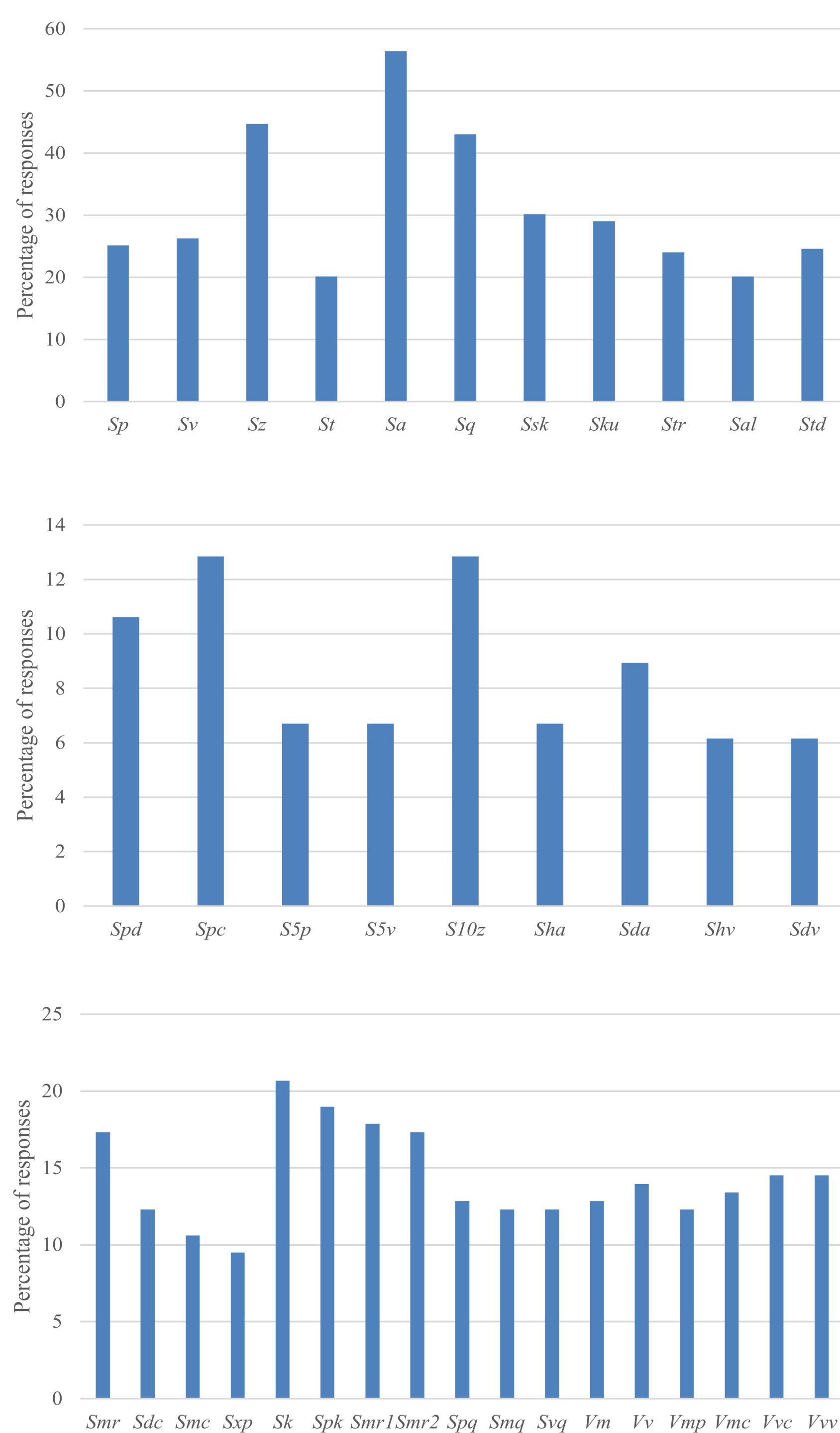


Figure 4. ISO 25178-2 parameters usage. Top: field parameters, Middle: feature parameters, Bottom: functional parameters

Figure 5 shows the sectoral split of the ISO 25178-2 results given in figure 4. The 'metrology & calibration' and 'research institutions' sectors show the greatest uptake, while the 'automotive & aerospace' sector shows the lowest uptake. Feature and functional parameters show poor adoption by most sectors, suggesting further education is required in industry to promote use of these parameters.

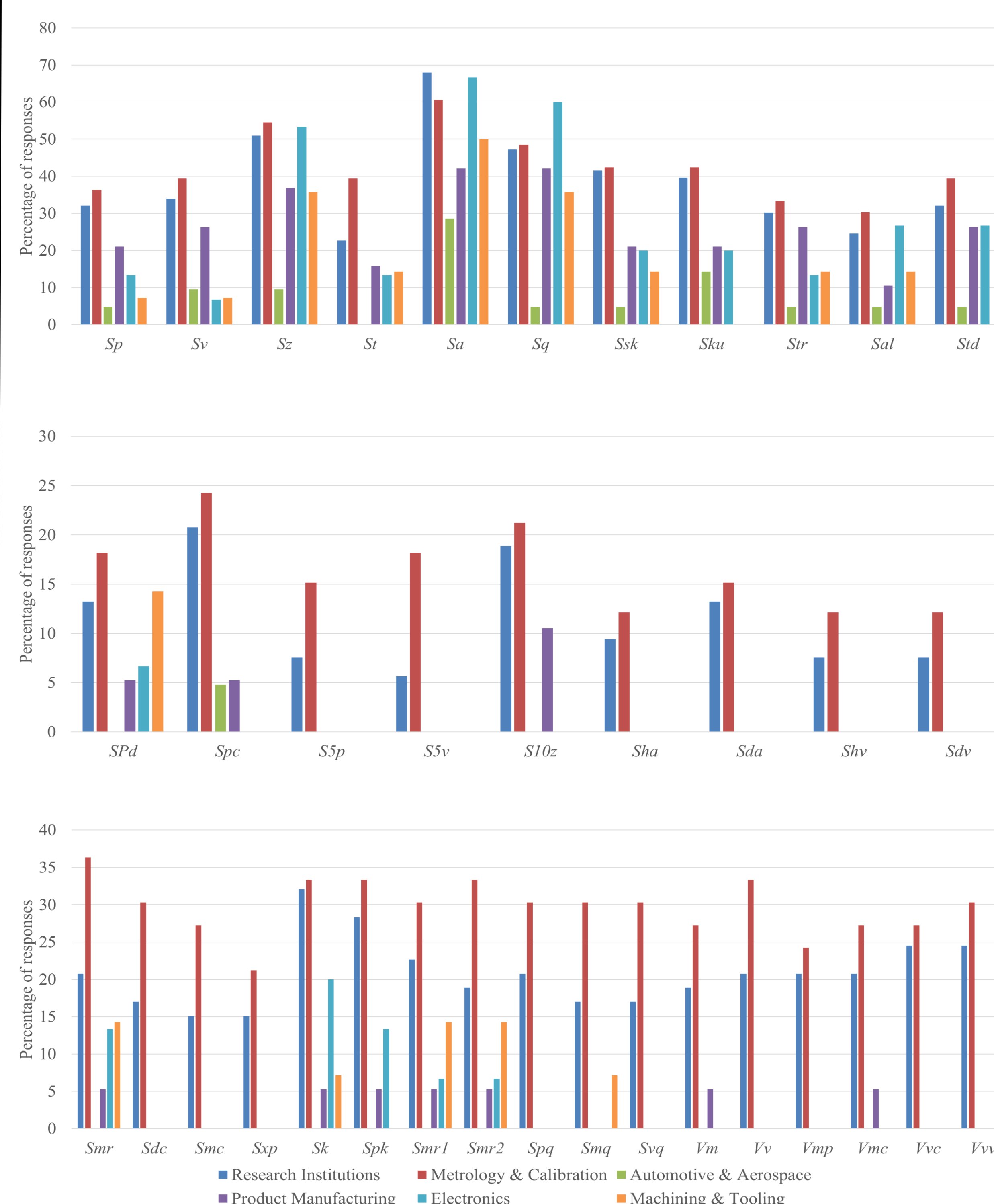


Figure 5. ISO 25178 parameters usage sector split. Top: field parameters, Middle: feature parameters, Bottom: functional parameters

Conclusions

The results showed a relative increase in the use of virtually all parameters in comparison to 1999, showing a marked improvement in the uptake and importance of surface texture parameters in industry. It should be considered that this could be a consequence of the exponential increase in computational power available to users since 1999, along with greater availability of third party surface texture parameter calculation software, enabling the calculation of many more parameters with relative ease. This scenario does not necessarily mean a greater understanding of the parameters used. In order to increase the uptake of the new areal surface texture parameters, further education and guidance is required for industry.