THE FUTURE OF MANUFACTURING METROLOGY –
A ROADMAP FROM THE ASSOCIATION OF GERMAN ENGINEERS

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INTRODUCTION
‘Faster, safer, more accurately and more flexibly’
is the title of the ‘Manufacturing metrology roadmap’ [1, 2] issued by the VDI/VDE (The Association of German Engineers and Association for Electrical, Electronic & Information Technologies) Society for Measurement and Automatic Control. The document, drawn up by a group of German experts from research and industry, presents a view of the development of metrology for industrial production over the next ten years. The proposed presentation summarizes the contents of the roadmap and explains the individual concepts of ‘Faster, safer, more accurately and more flexibly’ with the aid of examples.

METROLOGY AND MANUFACTURING
Due to global megatrends manufacturing technology is faced with a number of challenges. The topics of resource efficiency, of mastering new process technologies, of increasing flexibility and of transparency have a special significance in manufacturing today (Figure 1).

Trends in manufacturing drive changes in manufacturing metrology. This is the reason why technical committees of the ‘Manufacturing metrology’ department of the VDI/VDE Society for Measurement and Automatic Control have formed a working group which, in the light of the aforementioned trends in manufacturing technology, has set itself the task of producing a forecast for the future of manufacturing metrology.

While the term ‘manufacturing metrology’ is most commonly used in the German language, the term ‘production metrology’ is also typically found outside of Europe to refer to metrology within the context of production. [3, 4].

Figure 2 provides an overview of the important fields of application in manufacturing metrology.

The challenges and trends in manufacturing metrology can be described with the terms ‘faster’, ‘safer’, ‘more accurately’ and ‘more flexibly’ (Figure 3). The topics of accuracy and speed are of central importance as can also be gathered from other studies of metrology, for example, the market study on 3D metrology prepared by the Fraunhofer Society [5] and the technology roadmap for process sensors in the chemical-pharmaceutical industry [6].
The proposed presentation will describe in detail the future direction for manufacturing metrology as seen from an European perspective. It is clear that metrology will be increasingly important for industrial manufacturing and production. The increasing level of performance in metrology is reflected in its increasing measuring speed and higher levels of accuracy. At the same time metrology is becoming more flexible and can therefore deliver more information about production. Mastering the uncertainty of metrology in production will contribute to making production more efficient, more cost effective and result in safer products.

REFERENCES