IFA
Institut für Arbeitsschutz der
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Focus on IFA's work

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Laser-beam machining

Problem

Laser-beam machining (LBM) processes are increasingly being used in industrial practice for the processing of material surfaces. Applications range from micro-electronics, where ultra-fine structures are manufactured on wafers, to selective paint removal on aircraft components. Not enough is known about the hazards posed to employees and the environment by the use of LBM. The then German Federal Ministry of Education and Research (BMBF) therefore sponsored a joint project dealt with the transfer of laser-beam methods for surface processing to industrial practice. An important sub-project dealt with the problem of occupational health and safety and protection of the environment in relation to industrial LBM processes. Such processes exhibit certain features not shared by traditional machining processes, such as the increased generation of very fine dusts of varying composition.

Activities

Both the laser-beam emissions themselves, and those of particulate and vapours/gaseous materials were measured for selected procedures. The measurements were performed both at the source of emissions, and in the working areas of the employees engaged.

Development of smoke during laser-beam machining

Results and Application

The results of the studies into occupational safety and health and environmental protection can be exploited directly in the design of installations. They were compiled in the VDI series of manuals concerning the use of lasers in machining. These manuals provide illustrative and readily accessible information on the incidence and scale of hazards associated with the use of a laser for machining a given material. This information also serves to ensure that workers and the environment receive the greatest possible protection during the use of laser-beam methods in the field.

Area of Application

In particular, small and medium-sized enterprises using LBM processes for surface processing.

Additional Information

- von der Heyden, T.: Oberflächenbearbeitung mit Lasern – Normalerweise geringe Gefahr. BIA-Info 10/2001. Arbeit und Gesundheit spezial (2001) No. 10, p. 40

- Goede, M.; von der Heyden, T.: Arbeits- und Umweltschutz bei industriellen Laserstrahlabtragverfahren. In: Laser in der Materialbearbeitung – Suppl. 12. Published by: VDI-Technologiezentrum Physikalische Technologien. VDI, Düsseldorf 2000

Expert Assistance

IFA, Division 3: Hazardous substances: handling – protective measures

Literature Requests

IFA, Central Division

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