

SYSTEMATIC ERGONOMIC WORKPLACE DESIGN IN SEWING WORK

Organisation

MEWA Textil-Service AG & Co. Management OHG

Introduction

Over several years, an increased level of sickness with corresponding loss in working hours has been observed in the German sewing industry. The main group of illnesses found in this industry concern disorders of the spinal column and of the shoulder and arm. According to investigations performed by the Textil- und Bekleidungsberufsgenossenschaft (TBBG, Textile and Clothing Professional Association), these disorders account on average for more than 34% of all working days lost in this sector. This is a considerably higher rate than in other occupational groups. This increased frequency of musculoskeletal disorders (MSDs) and complaints is attributable to strain on the musculoskeletal system caused by working at conventional sewing workstations. Firstly, sewing work involves highly repetitive actions of the shoulder/arm system. Secondly, there is a high proportion of static work involving both the spinal column (permanently maintained forward leaning postures while sitting) and the lower extremities. In the past, sewing workstations were not designed in accordance with ergonomics guidelines, and so the height of many sewing tables still corresponds to those of the foot-operated machines common at the end of the 19th century. The adjustment room for the worktop and the foot pedal is often constricted. The same is true for the knee space into which machine parts often protrude.

Aims

The project aim was to prevent MSDs of the shoulders/arms and spinal column at sewing workstations by implementing scientifically evaluated ergonomically designed sewing workstations. The aim was to achieve positive long-term effects for both the employees and the company:

- a clear reduction of workload;
- a decline in the rate of sick-leave due to MSDs;
- an increase in employee job satisfaction;
- an improvement of the economic performance and productivity of the enterprise.

What was done, and how

Initially, a research project was performed under the mandate of the German Technical Committee "Textile" and the German statutory accident insurance institutions for the leather/clothing industry to assess MSD risk factors at sewing workplaces. On the basis of this risk assessment, ergonomic improvements have been developed and field-tested in different sewing tasks. The research was performed by the BG Institute for Occupational Safety and Health (BGIA), the ergonomics department of Munich College of Higher Professional Training, and the ergonomic consultant Schwan in Frankfurt. The actions were conducted at four businesses in the German sewing industry in the fields of footwear, technical textiles, soft toy production and clothing. As a result, an ergonomic model sewing workstation has been developed and recommendations for the ergonomic design of sewing workstations (BGI 804-02, TBBG and BG, 2005) have been produced.



Figure 1 Conventional sewing workplaces do not meet modern ergonomic standards

In the present project, all the 40 sewing workstations at MEWA Textil Service AG & Co. Management OHG were converted on the basis of the BGI 804-02 recommendations. The conversion included the following:

- an ergonomic spatial arrangement of the workspace and foot pedal which encourages an upright posture and thus reduces the strain on the spinal column;
- making it significantly easier to adjust the worktable, thus making it comfortable to swap between sitting and standing activities;
- a complete redesign of the foot space with a pedal release enabling the feet and legs to move unhindered;
- the installation of individually adjustable support pieces for hands and arms, resulting in a reduction of static strain on the shoulder and neck muscles.



Figure 2 Modern sewing workplaces are adjustable and encourage the workers to move



Figure 3 Details of an ergonomic sewing workplace: Arm rests and spacious design help to avoid painful postures

The measures were performed in close cooperation of the MEWA company together with the Schwan engineering consultancy as well as the health and safety experts and the workers of the enterprise. Workers were informed in detail and asked for strain and job satisfaction before and after the conversion. In parallel with the installation of the ergonomic workstations the workers were trained to use them. After the conversion, the company determined the effects of the altered workstations both with regard to humanitarian considerations, e.g., the subjectively perceived improvement in the working situation and job satisfaction, and with regard to economic aspects, e.g., an increase in productivity and a drop in the number of days when workers were unfit for work.

What was achieved

There was a very high level of acceptance of the ergonomically redesigned workstations by the operators. The workers clearly felt that the new working situation served to reduce stress and strain. The management of MEWA received feedback to this effect regarding the increased level of job satisfaction experienced by the workers.

A comparison of the number of days when the workers were unfit for work before and after the intervention showed a drop of 16%. It was particularly pleasing for the company that the ergonomic reorganisation was accompanied by an increase in productivity of around 15%. This was due to the fact that the

needle operating time for the new machines had increased by up to 50%. The ergonomic reorganisation had thus proved to be a great success in humanitarian and economic respects.

The costs of the ergonomic reorganisation of the machines amounted to EUR 1,500 per workstation so that the overall investment made by MEWA was about EUR 60,000. This investment proved profitable within a few months due to the fall of lost days and, in particular, the increased productivity. In addition to these economic effects, the company philosophy of MEWA, a traditional family enterprise, has been confirmed. It reads as follows: "Respect for people and society has a long tradition and is firmly rooted in our company culture. It determines our daily planning and actions, not rigidly and absolutely, but as a fluid process!"

Further information

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Transferability

The example can be applied without any problems to sewing workstations in other divisions and to assembly workstations in other sectors, both in Germany and in other EU Member States.

Transferring this example to other workplaces in Germany has proved successful: Sewing workplaces for upholstery at BMW AG and EvoBus GmbH have also been adapted. In the case of EvoBus, they are barrier-free and suitable for disabled workers.