

## DESIGNING THE WORKING POINTS OF A TEXTILE MACHINE

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Project manager:	M. Haase, Dipl.-Ing.	Duration: 01/96 - 12/96
Authority responsible for the project:	BMWi - Gewiplan	
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### Initial situation

As a result of the coming into force of European Laws and of the Product Liability Act on 01.01.1990 machine manufacturers are forced to accept more responsibility for the design of their machines according to the requirements of operators and in conformity with safety requirements. Machine manufacturers have to meet higher requirements as to danger-free technical problem solutions which contain ergonomic parameters and parameters concerning safety.

### Research target

The research target consists in the examination and design of the working points of the KCL 6160 circular loom to meet the requirements made on the design of a machine according to EC directives and European standards. These requirements aim at an operator-friendly and safe machine design adapted to the range of movements of operators to optimally compensate both physical and psychic stresses occurring in the working process. In this way, the efficiency and reliability of the operator will be increased.

### Research results

Based on the information obtained from the workplace study and the investigations carried out by means of the computer-aided ANTHROPOS simulation program, a safety analysis according to the EU Machine Directive and an ergonomic examination of the current state of the circular loom is performed and evaluated according to special evaluation methods. The results are used for the preparation of design proposals. The main deficiency was eliminated by enclosing the central weaving unit in a safety case which was tested as a prototype by the manufacturer. Other deficiencies were eliminated by the following measures:

- Safety cover over the shuttle course (implemented as a prototype)
- Appropriate signal lamps between the push-button key box and switch cabinet
- Flexible additional lamp with magnetic holder
- Wider stairs
- Wider and lower bobbin creel
- Transferable operating platform (M-ladder) above the weaving unit
- Hang-in ladders within the area of the bobbin creel
- Operating manual extended by safety instructions.

The machine concept with the proposals for design incorporated was again tested under safety and ergonomic aspects. All tests yielded the evaluation as "best possible design". A final expertise is being prepared. It will give recommendations to the manufacturer concerning the achievement of CE-certification as well as security in respect of the Product Liability Act.

### Application and economic advantages

The testing and design of working points according to ergonomic aspects in terms of the example of the circular loom represents a pilot project for textile machine engineering in the Federal Republic of Germany. This complex approach, developed in detail within the project, forms the basis for the application to any other type of textile machine.

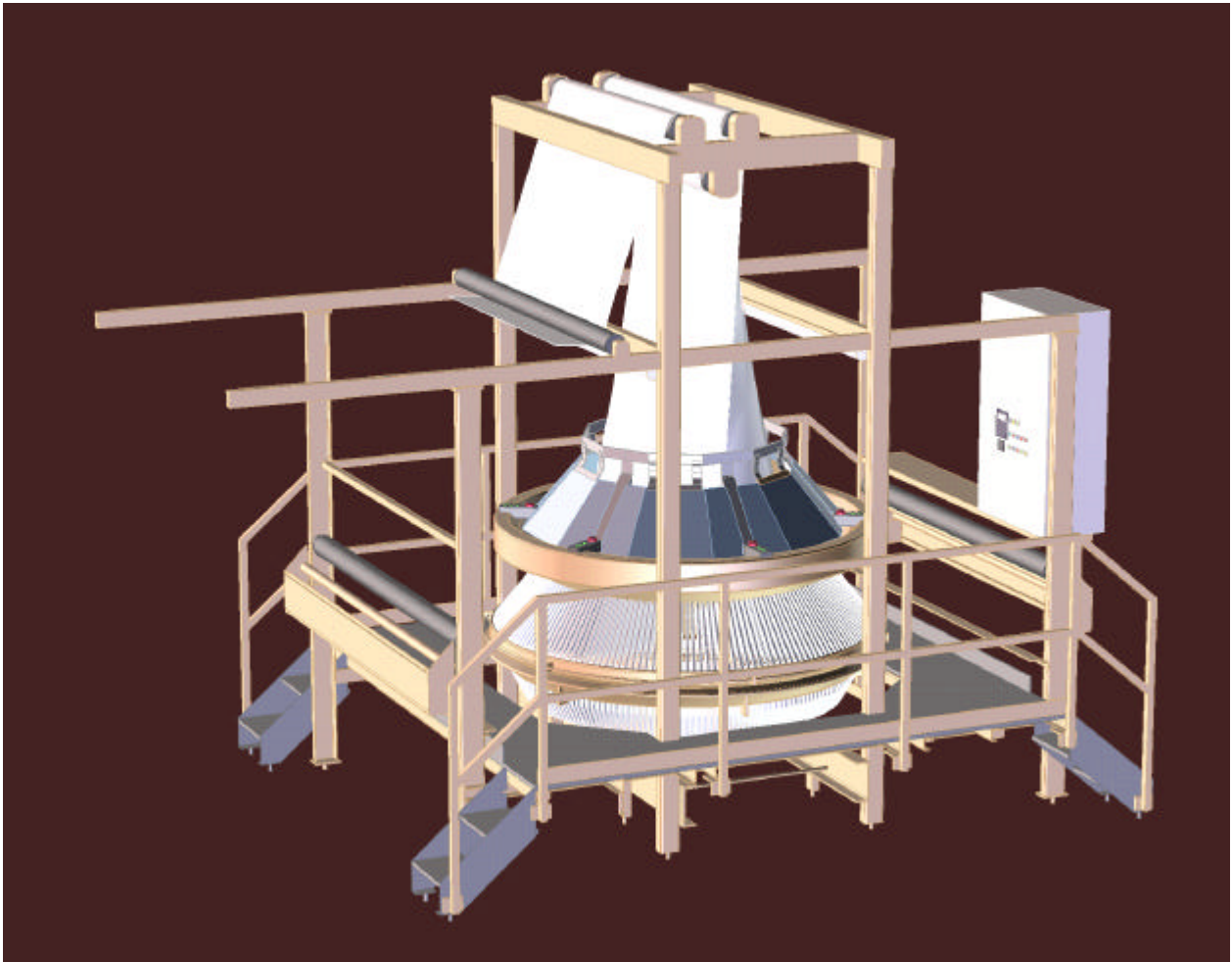


Fig.: Circular loom KCL 6160 with safety cover