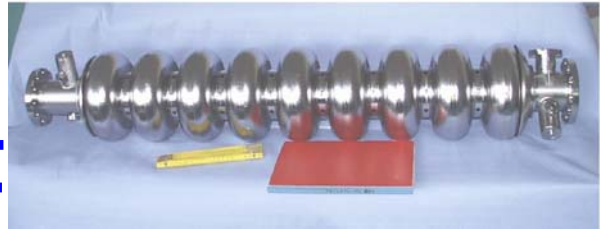




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Design Report Hydroforming Machine

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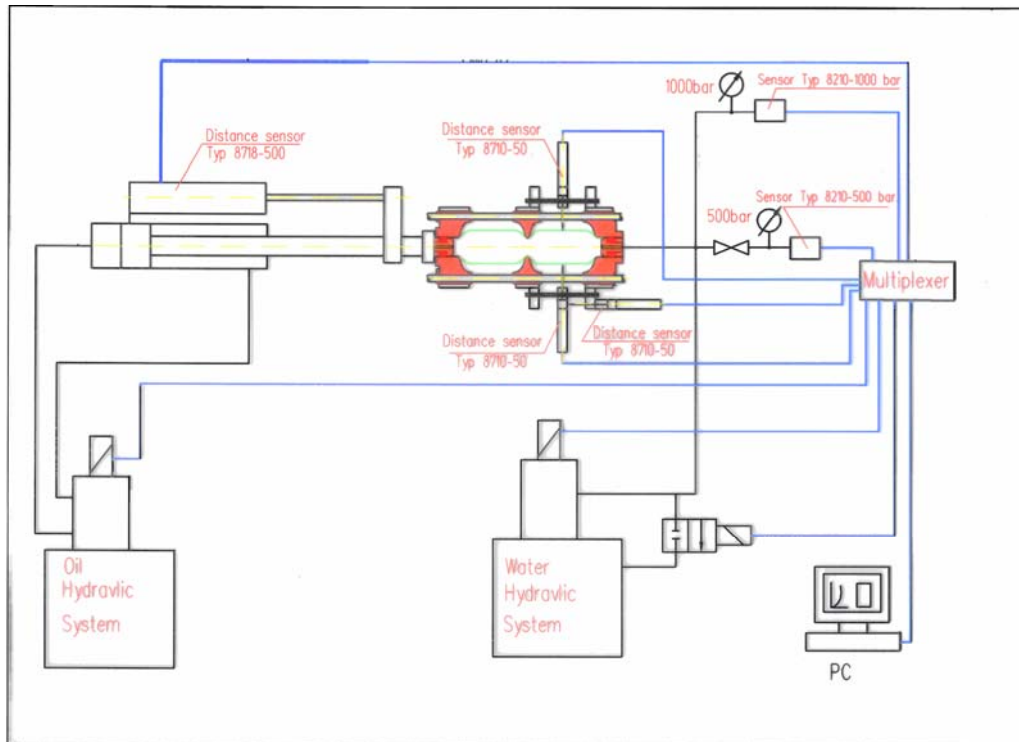
Design Report Hydroforming Machine

The fabrication by hydroforming of a seamless niobium cavity of TESLA shape, with a ratio of equator diameter to iris diameter about three, is a challenging task and requires special development.

One starts with tube of diameter intermediate between iris and equator. The forming procedure includes two stages: reduction of the tube diameter in the iris area and following expansion of the tube in the equator area.

The hydroforming experiment itself consists generally of three steps:-Determination of the strain-stress properties of the tube material, computer simulation of the forming and the hydro forming test itself. During hydroforming experiments an internal pressure is applied to the tube and simultaneously an axial displacement, forming the tube into an external mould.

The experiments will be done by a machine for hydroforming built earlier within the scope of the TESLA collaboration. In the frame of the task 3.2 the machine will be reconstructed in order to make possible hydroforming of not only monocells but also of multicell cavities. Schema of hydroforming machine can be seen in the figure.

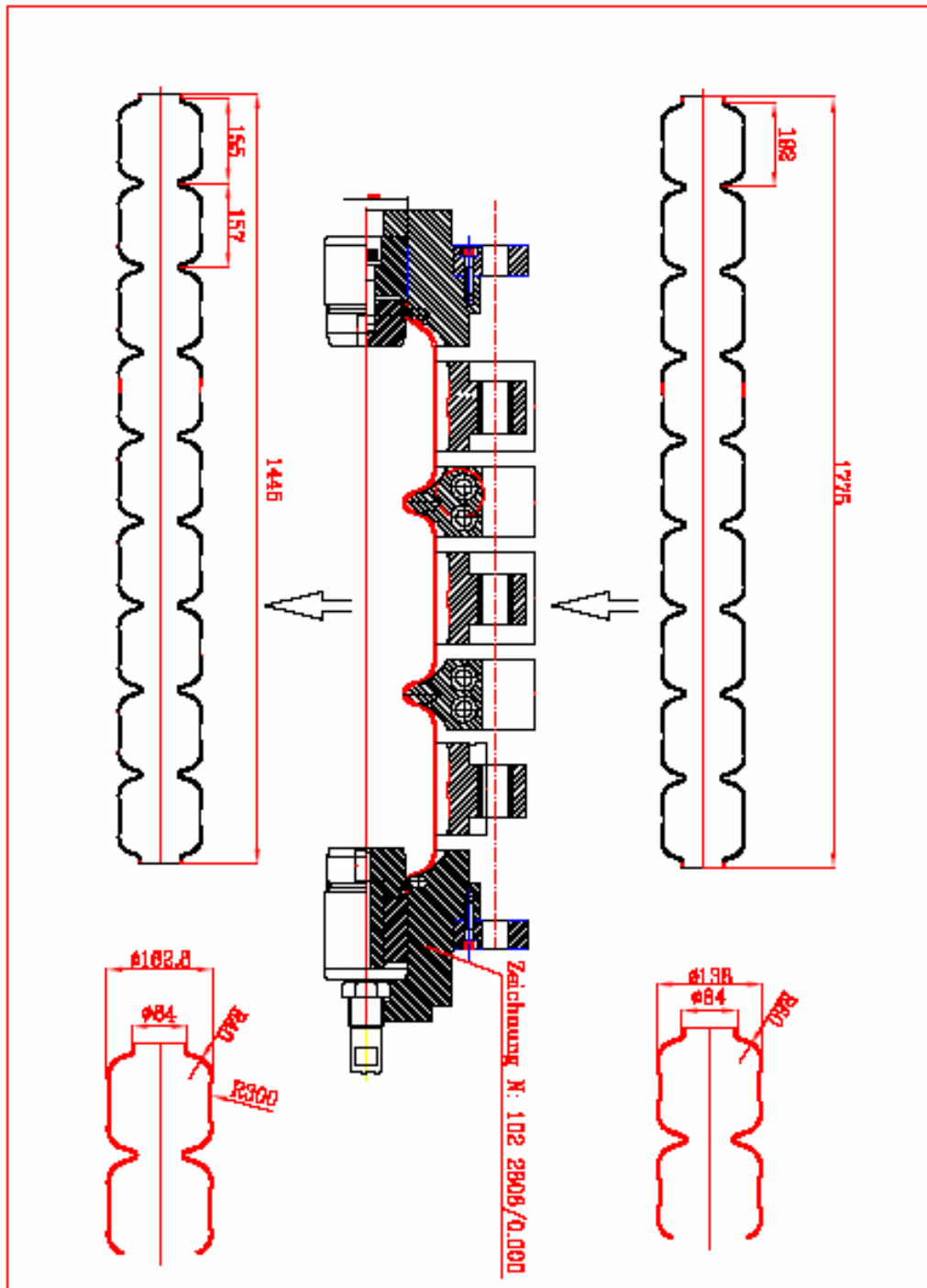


Schema of the hydroforming machine

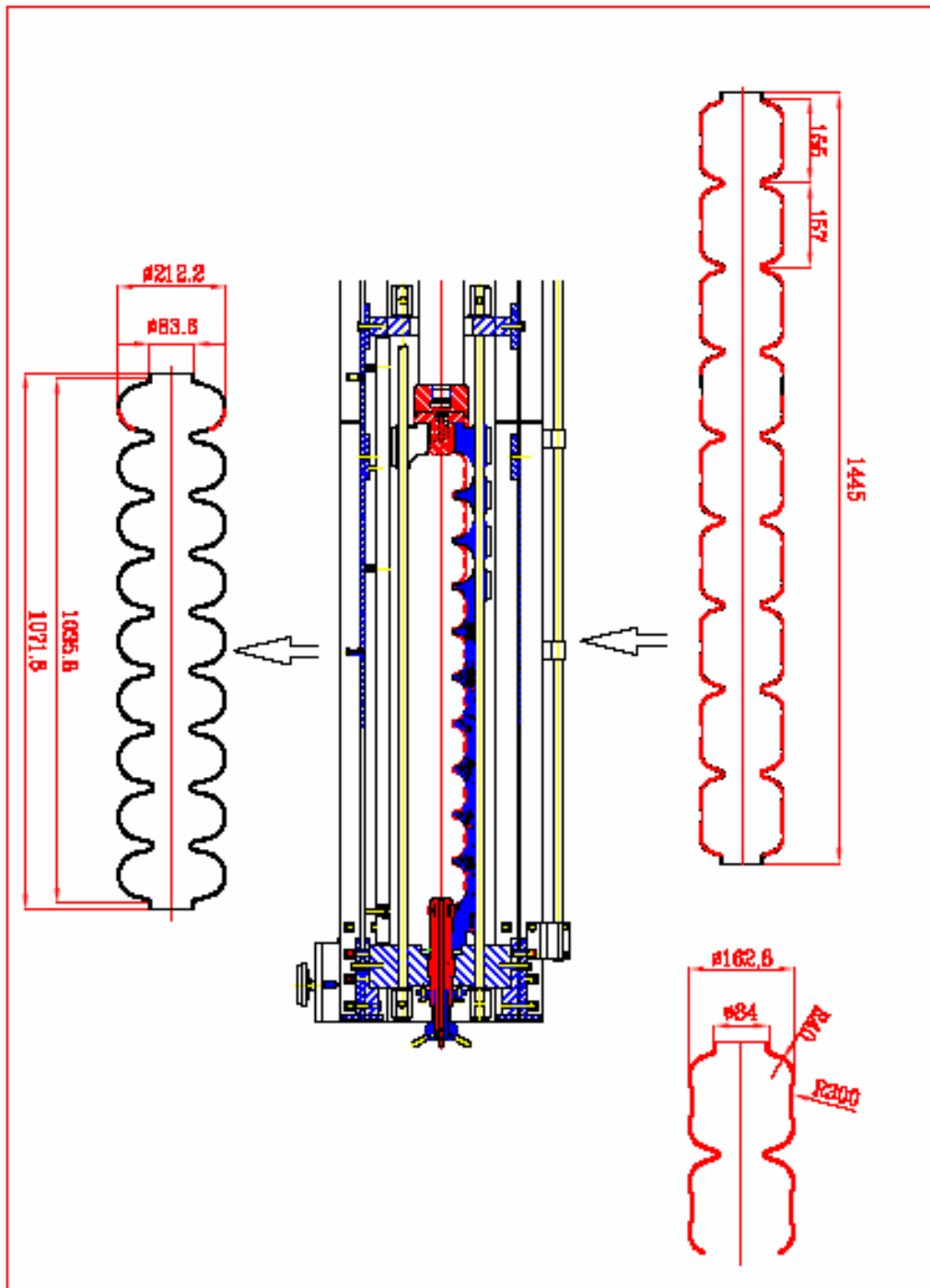
Design report WP3.2 Hydroforming

New moulds for fabrication of multi cells are designed. A specially developed system will allow symmetrical movement of the moulds during simultaneous forming of several cells. A support system is redesigned and will be reconstructed in order to provide more space in the hydroforming unit of the machine.

More detailed documentation is attached.



Stage one of hydroforming



Stage two of hydroforming