

DISTORTION MEASUREMENTS FOR THE  
RIKEN SSC MAGNETS

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It has been noticed that considerable sizes of mechanical deformation may occur in the Riken SSC sector magnets because of large electro-magnetic force. The numerical values have been examined in conjunction with force supporting structure using FEM ( Finite Element Method ) analysis <sup>1</sup> ).

Recently, We have completed two sector magnets ( N and W sector ) in factory and have made electrical and mechanical tests.

We give here the measured results for shortening of magnet pole gaps and sinking of pole faces.

We used a special brass rod with adjustable screw to be free from any trouble with critical measuring tools in strong magnetic field. Adjusted length of the rod to the pole gap distance was measured with a micrometer out side the field. The measurements were made along the pole side edge for the convenience of access.

For the purpose of measurements of pole sinking, we set a tensioned Nylon thread ( 0.285 mm in diameter ), which was fixed to two independent supporting poles as a reference, above the lower pole face along the side edge.

The distance between the thread and the lower pole face was measured in a same manner described above with a special care.

The desired quantity is given as a difference between the measured value with and without magnetic field.

The typical results are shown in Fig.1 and Fig.2.

The measurements were made by inspectors Mr. Shiro, Hoshika and Miki in the factory.

References

1) Y. Ikegami, T. Wada, M. Hara and S. Motonaga : Reports I.P.C.R., 57, 177 (1981)

Y. Ikegami, T. Wada and M. Hara : RIKEN Accelerator progress Report, 15, 166 (1981)

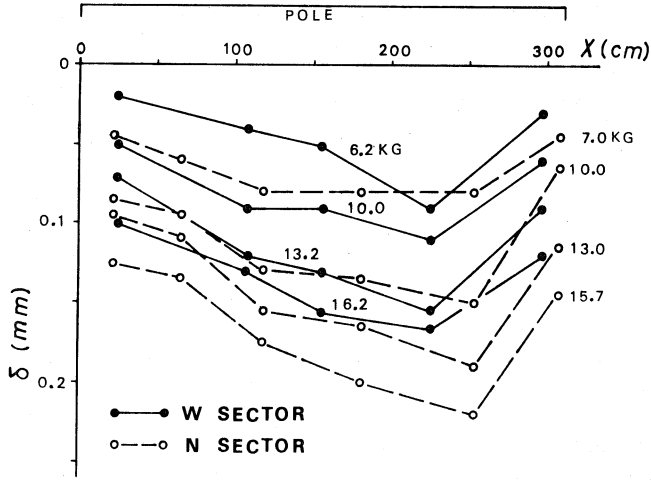


Fig.1 Shortening ( $\delta$ ) of the pole gaps for the N and W sector magnet measured at positions along the pole side edge. Abscissa  $X$  denotes distance from the pole top edge. Numbers attached to the lines denote values of applied magnetic field in KG.

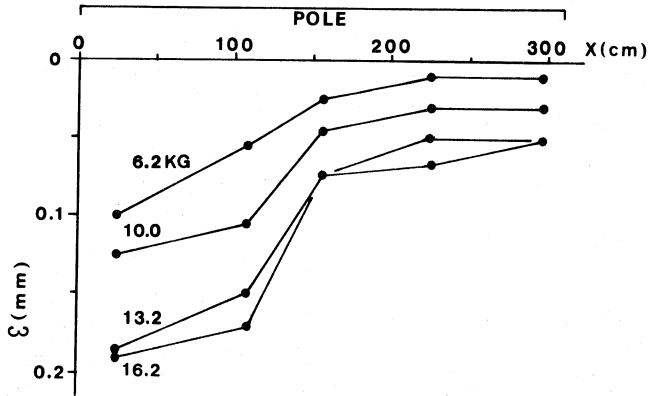


Fig.2 Sinking ( $\epsilon$ ) of the lower pole face for the W sector magnet measured at positions along pole side edge. Abscissa  $X$  denotes distance from the pole top edge. Numbers attached to the lines denote values of applied magnetic field in KG.