



# DIAPHRAGM SYSTEM

*The Diaphragm System allows precise positioning and holding of one or more elements in a main element. More specifically, the technology uses a simple mechanical principle and punched laminations to position/center and hold elements of nearly any shape with extremely high precision in a cost effective way.*

## AREA OF EXPERTISE

- Mechanics

## IP STATUS

- Ready for licensing through CERN TT or through Ijspeert Innovative Technologies. Patents granted in Europe and USA. PCT. WO0129471.

## CONTACT PERSON

amy.bilton@cern.ch

Find out more at:

[kt.cern](http://kt.cern)

## FEATURES

- Precise positioning achieved by laminations with a slightly offset aperture.
- Depending on the shape of the aperture of the laminations many different structures may be positioned and to a certain degree clamped.
- Release of the objects being positioned may be done efficiently depending on the mechanism providing the clamping force.
- Identical laminations used with different orientation to obtain positioning force.
- The system may position a number of different objects inside a main structure that provide a clamping force.

## APPLICATIONS

- Couplings.
- Electrical Connectors.
- Tubing and piping.
- Tool holding equipment, chucks.
- Heat exchangers.
- Work piece holding equipment.

## ADVANTAGES

- Orientation of laminations provides a balanced system with minimal vibrations when rotated even at extremely high speeds.
- Cost efficient way due to simple and identical laminations. May be punched or cut by water jet.
- Flexible - nearly any shape may be positioned.
- The system may be modulated to eliminate the effect of centrifugal forces, alternatively let centrifugal forces increase the centering and clamping effect.
- The system offers highly precise positioning in an order of magnitude better than the precision of the laminations, depending on the number of laminations used (micron range).
- Efficient way to position and clamp an object inside a main object.
- Strong holding force may be applied.



## LIMITATIONS

---

- Laminations may leave traces on the object being positioned if the clamping force is high, depending on the materials involved.

## SUCCESSFUL TRANSFER

---

The Diaphragm System has been successfully transferred to Hainbuch and Ijspeert Innovative Technologies for the development of tool holding equipment, providing an efficient method to precisely position and clamp work pieces for machining, and the flexibility to be integrated into tailor made solutions. Applications are available from Hainbuch and Ijspeert Innovative Technologies.

