

The micro-RWELL for future HEP challenges

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The challenges posed by the forthcoming High-Energy Physics experiments, necessitate the development of particle detection technologies that are easily engineered and compatible with industrial-scale production. The micro-RWELL, a single-amplification stage resistive MPGD based on sequential build-up technology, effectively meets these demands. In this contribution, we provide an overview of the detector characteristics, outlining the design and testing steps conducted at INFN-LNF. Additionally, we offer a schematic description of the construction processes performed at the ELTOS Company and CERN MPT Workshop.

The experience detailed in this contribution indicates that a significant portion of the detector construction can be effectively carried out by the industry, providing substantial advantages in terms of production time and cost-effectiveness. Furthermore, it is crucial to highlight the significant effort invested in the production of large DLC (Diamond-Like-carbon) foils, a fundamental component of the detector amplification stage. The acquisition of the DC-magnetron sputtering machine, a fruitful joint venture between CERN and INFN, represents a crucial development, allowing a remarkable advancement in this technology.

The results of the tests carried out with an X-ray gun at LNF and particle beams at the CERN North Area beam facility are then discussed in detail. Preliminary outcomes of the co-production pilot test performed in 2023 are summarized, indicating a production yield of approximately 90%. The fruitful experience gained in this phase of the technology transfer is a first step towards the construction of larger detectors, as envisaged for the forthcoming challenges in HEP.

Collaboration

Role of Submitter

I am the presenter

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