



Ultra-High Vacuum System Assembly Tool

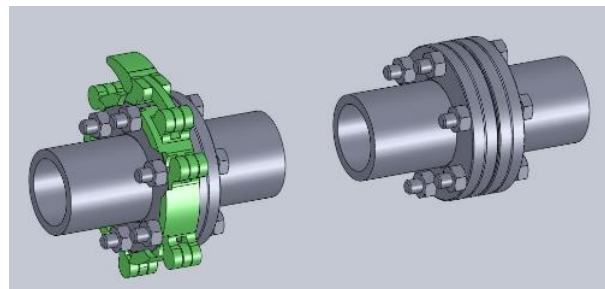
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Background

Ultra-high vacuum (UHV) systems are generally assembled from metal tubes connected with "ConFlat" (CF) type flanges and copper gaskets. The flanges incorporate knife edges, which bite into the copper gaskets to form a continuous metal envelope for the vacuum system. When assembling these systems, it is essential that the gasket be properly seated in the flange. If this is not prepared properly, a leak will form at that location, preventing the vacuum system from reaching its desired pressure. The distance between the flanges is much smaller than a person's finger; however, tools are needed to hold the gasket in place before the flanges are implemented. Furthermore, the gasket often falls out of position as the flanges are brought together, leading to frustration and lost time in the assembly of vacuum systems. A present market need exists for tool to refine the assembly process of vacuum systems.

Technology Description

Researchers at the Air Force Research Laboratory (AFRL) have developed a vacuum system assembly tool to ensure pressure is kept within a continuous vacuum system. The main objective is to secure the ConFlat flanges in place during gasket installation. The system's hinged segments, locking lever, and fingers can be made with a metal or plastic collar, thumbscrew locking system, or an alternate finger design. A prototype has been built and tested.



Gasket in two-flange bolt connection

Key Advantages

- Various design materials may be utilized
- Improves assembly time of vacuum systems
- System may be used with optical components, temperature gauges, heating and cooling systems, etc.
- Flexible design allows for modification of the fingers and external mounting points
- A prototype has been built and tested

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