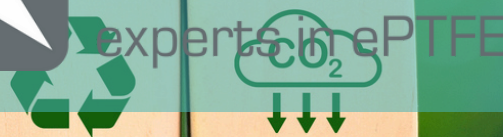


CASE STUDY

KWO® MultiTex® Tape Decarbonization Industry



KWO®
experts in ePTFE



PRODUCT

KWO® MultiTex® Tape.

INDUSTRIAL SECTOR

Decarbonization / Carbon Capture.

APPLICATION

Large-diameter flanged joints used in the CO₂ handling system of a Carbon Capture and Storage (CCS) plant. The system includes vertical piping sections assembled at over 60 meters above ground, making reliability at first installation crucial due to limited accessibility.

The plant is the first full-scale industrial CCS project in Italy, developed to reduce atmospheric CO₂ emissions.

PROBLEM DEFINITION

During the design phase, the engineering team needed a sealing solution that would:

- Ensure tightness
- Be suitable for flanges larger than 5 meters in diameter
- Withstand handling and lifting of pre-assembled piping sections from ground level to over 60 meters height
- Be installed once and avoid rework after final bolting at elevation
- Provide resistance to environmental exposure and ensure long-term performance

The sealing options considered at first lacked sufficient deformability and reliability, particularly under the complex handling and installation conditions.



SOLUTION AND RESULT

Throughout the design and pre-construction phases, KWO® and the local distributor collaborated intensively with the engineering and construction teams responsible for the Carbon Capture and Storage (CCS) facility. The aim was to identify a sealing solution that could withstand the unique challenges presented by this groundbreaking project—particularly the need to guarantee flange integrity during the pre-assembly, lifting, and final installation of oversized pipe sections.

After a thorough evaluation of the technical requirements and available alternatives, KWO® MultiTex® Tape was selected as the optimal sealing material.

Thanks to its multi-directionally expanded PTFE structure, the tape provided:

- Outstanding conformability
- Low stress relaxation, enabling long-term sealing integrity
- High chemical resistance to CO₂-rich atmospheres
- Ease of installation even on large flanges positioned horizontally on the ground
- Dimensional stability during lifting and final vertical assembly at elevation
- No need for rework or readjustment, reducing downtime and increasing safety

Performance Impact:

The sealing system contributed to the exceptional efficiency of the CCS plant, which is achieving a CO₂ capture rate exceeding 90%, with peaks up to 96%. The captured CO₂ originates from stack emissions at atmospheric pressure and with carbon concentrations below 3%, one of the most challenging industrial conditions for sealing.

These results position this CCS installation as the first industrial-scale project globally to demonstrate such high capture performance under these conditions.

APPLICATION PARAMETERS

Flange material: AISI 304L

Operating temperature: details confidential

Operating pressure: details confidential

Medium: CO₂-rich stream + trace gases

Flange form: OD>5 meters

Previous seal: none, new installation.

