

EM CONSULTING SERVICES

FULL EM CONSULTING SERVICES - FROM AN IDEA TO A DEVICE

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QWED offers a wide range of electromagnetic consulting services. Years of experience in supporting our customers in a wide variety of EM applications made us the right people to support you at any stage of a design cycle of your device. Our consulting engineers will help you to optimise and improve your early stage device or will provide you with a full EM consulting service consisting of a whole design cycle – from an idea to a device.

QWED offers EM consulting in the following industrial areas:

Design of Industrial High-Power Microwave Applicators

We offer a comprehensive assistance in a whole design cycle of high-power microwave applicators: from the very scratch through a design, up to the development, testing and maintenance. It includes such applications as organic/inorganic microwave-assisted synthesis, wood drying, sintering of ceramics, rubber devulcanization, asphalt pavement recycling and maintenance, food waste treatment.

Design of radiation leakage protection

Our consulting team supports you in designing wide variety of radiation leakage protections, including casing and chokes for microwave ovens and high-power microwave applicators.

Design of Microwave Power Setups for Food Processing Applications

Our setups are based on state-of-the-art multiple solid-state power sources with controlled frequency, power, and phase-shift. Applications in microwave chemistry as well as in prototypes for long-term envisaged domestic ovens with advanced functionalities have been successfully demonstrated.

Antenna design

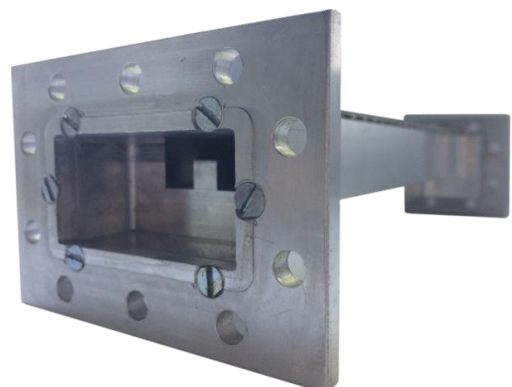
From patch antennas to large double reflector antennas and antenna systems. In particular, we provide consulting on the design of advanced feeders and reflector antenna assemblies. Our special asset is the insider knowledge of QuickWave V2D software – a tool for full-wave analysis of large axisymmetrical structures (Bodies of Revolution), which is unique on the world's market and used by a majority of manufacturers of Earth station satellite antennas.



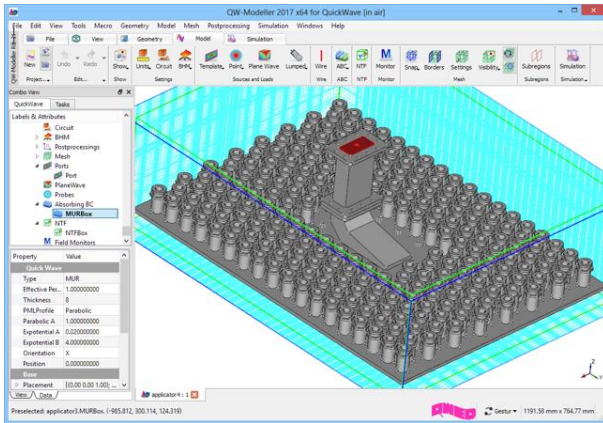
Design of passive components with emphasis on waveguide technology in microwave and millimeter-wave ranges (polarisers, phase shifters, OMTs, filters, diplexers)

Our competences in this area led to collaboration with leading US space research laboratories including JPL and NRAO in their application of our QuickWave 3D software for such ground-breaking projects such as the famous Atacama Large Millimeter Array:

ALMA Memos: 278, 316, 325, 343, 381, 467, 469, 536 at <http://library.nrao.edu/alma.shtml>.



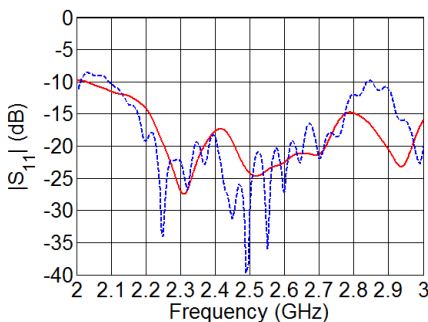
QWED's team designed a **mobile microwave applicator** for bonding of undesirable technological longitudinal joint opening occurring in bituminous pavements. The design accounted for coupled electromagnetic-thermodynamic modelling using QuickWave software, microwave characterisation of selected bituminous mixtures, control of the exposure to microwave radiation, and heating rates measurements. This work solves significant technological issue of effective bonding of bituminous surfaces, thus, remarkably influencing road durability. The applicator is equipped with a waveguide nozzle and hexagonal lattice of cylindrical metallic chokes preventing microwave leakage.



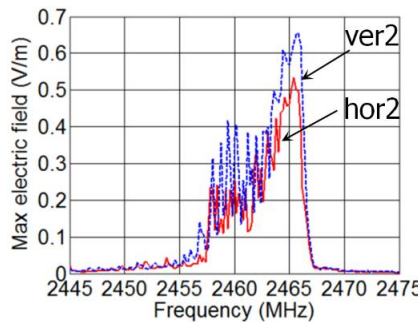
Simulation model of the applicator in QW-Modeller.



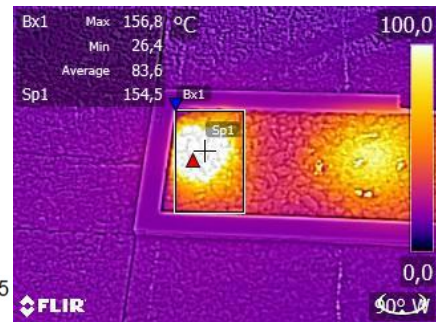
Prototype of the applicator.



Magnitude of reflection coefficient simulated with QuickWave (red) and measured for the applicator (blue).



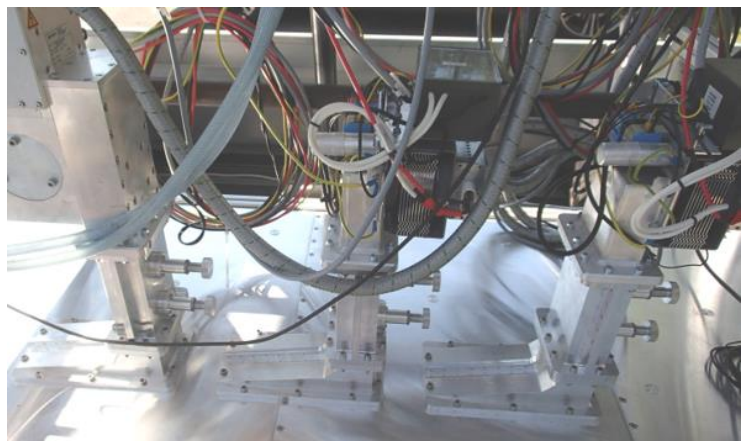
Time-maximum electric field measured at 0.5 m distance from the side of the applicator (source: 1 kW). Occupational exposure limit: 137 V/m.



Temperature signature measured after 10 min of the exposure to microwave radiation (source: 1 kW). Initial temp. 27 °C.

The **microwave applicator system** is equipped with three waveguide nozzles and a hexagonal lattice of cylindrical metallic chokes preventing microwave leakage. The device is equipped with a set of radiation sensors cooperating with a remote control system that will turn off the microwave sources in case of safety limits for non-ionizing EM radiation are not satisfied.

Microwave applicator system for thermal bonding of bituminous surfaces with an array of three waveguide nozzles.



This work was conducted in cooperation with Road and Bridge Research Institute and was co-funded by the Polish National Centre for Research and Development under Applied Research Programme PBS2/B3/19/2013 NGAM2 contract.



TRY US!

If you are interested in trying QuickWave EM software
with its specialised features visit us at www.qwed.eu

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