



## LIQUID CRYSTAL ELEMENTS

The Liquid Crystal Elements were developed and manufactured by Institute of Applied Physics at Military University of Technology (MUT) in Warsaw, Poland to satisfy all technical requirements that were sent to Institute of Applied Physics at Military University of Technology by Vavilov State Optical Institute in St. Petersburg, Russia on 15 February, 2010.

To approach the solving a problem in diagnostics of a dense plasma (so-called Thomson diagnostics), Institute of Applied Physics at Military University of Technology (MUT) in Warsaw, Poland developed and manufacture the following Special Liquid Crystal Elements) which should be farther investigated in Russian laboratories on:

- Laser Damage Resistance (LDR) of LCC,
- Switching on time ( $\tau_{ON}$ ) of LCC

The Polish Side brings The Russian Side the following Liquid Crystal Elements:

### 1. Twisted LCNP3 (TN5, TN7 and TN9) cells (Cells with numbers 5, 7 and 9)

Twisted TN5, TN6, TN7, TN8, TN9 and TN10 cells are generally constructed just the same as it was done in the case of the „Phobos-Ground” project. The TN6, TN7 and TN9 cells operated in transparent “positive TN mode” . The above cells are armed in:

- ✓ NL rubbed (Nylon 6/6 alignment) layers in the case of TN5,
- ✓ PL rubbed (Polyimide SE-130 alignment) layers in the case of TN7,
- ✓ SI rubbed (SiO<sub>2</sub>) blocking layers in the case of TN9.

and transparent Porous Indium Tin Oxide (P-ITO) electrodes (with  $n \sim 1.54$  and sheet resistance  $\rho \sim 2000 \Omega/\square$ ) obtained by special deposition,

The schematic cross-section of TN6, TN7 and TN9 cells are shown in Fig. 1.

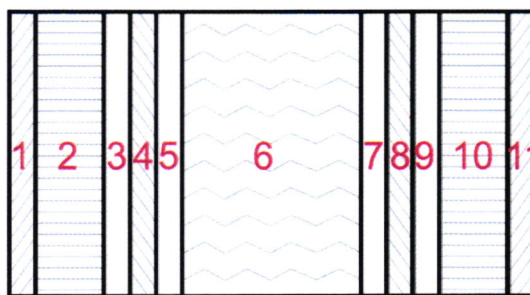


Fig. 1 The cross-section of refractive index matched twisted TN5, TN7 and TN9 cells, where: 1 and 11 are bilayer, dielectric (vacuum deposited) AR layers; 2 and 10 are QP; 3 and 9 are transparent P-ITO electrodes; 4 and 8 are BF (bilayer SiO<sub>2</sub>); 6 is LCM3; 5 and 7 are:

- ✓ NL rubbed (Nylon 6/6 alignment) layers in the case of TN6,
- ✓ PL rubbed (Polyimide SE-130 alignment) layers in the case of TN7,
- ✓ SI rubbed (SiO<sub>2</sub>) blocking layers in the case of TN5.

