

STOJAN VESSEL® SV-2

FOR BURNING RATE MEASUREMENT OF SOLID ROCKET PROPELLANTS IN A CLOSED VESSEL

The SV-2 (Stojan Vessel®) is designed for the time and cost saving determination of the burning rate vs. pressure dependencies of solid rocket propellants. A single shot is sufficient for plotting burning rates in the whole pressure range.

The measurement using Stojan Vessel is primarily based on the advanced procedure for the determination of the burning rate of solid rocket propellants. In comparison with the Strand Burner, Stojan Vessel is a simple and safe instrument based on the more advanced mathematical procedure for calculation of ballistic properties taken from a single shot only. This procedure was invented and developed by Dr. Petr Stojan and the measurement using his instrument became the standard testing method for rocket propellants in the Czech Republic.

APPLICATIONS

The SV-2 is used for research and development, for manufacturing quality control or in-service surveillance of both double-base and composite solid rocket propellants. The method can reveal with high sensitivity and reliability the following factors influencing ballistic behavior of the tested propellants:

- ▶ Influence of additives (moderators, catalysts, binders, oxidizers etc.)
- ▶ Dependence on initial temperature
- ▶ Prediction of unstable burning or explosion hazards after ageing tests

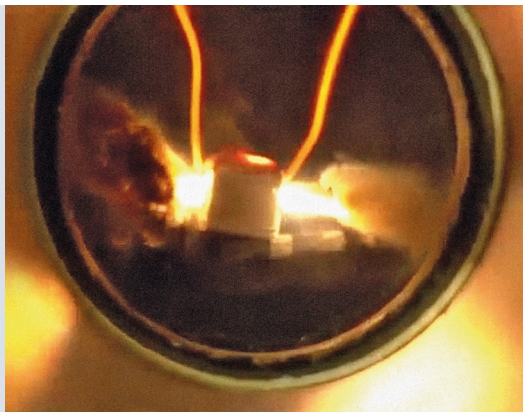
OPTIONAL ACCESSORIES

Optionally, it is possible to choose a larger volume of the SV5-PV test vessel, which is intended primarily for testing samples in a closed vessel up to pressure of 50 MPa (e.g. testing of a piece of combustible case or ignition part of a modular charges). Furthermore, it is possible to upgrade the equipment for testing in inert gas at a semi-constant pressure up to 15 MPa and in addition a sapphire window in the lid of the chamber.

OZM Research can also supply all the equipment and procedures necessary for sample preparation and conditioning of the SV-2 instruments (hydraulic press, pressing tools, molds for casting, cutting machines, cutting tools, temperature chambers, etc.). Laboratory sub-scale rocket motor available for validation of measurement.



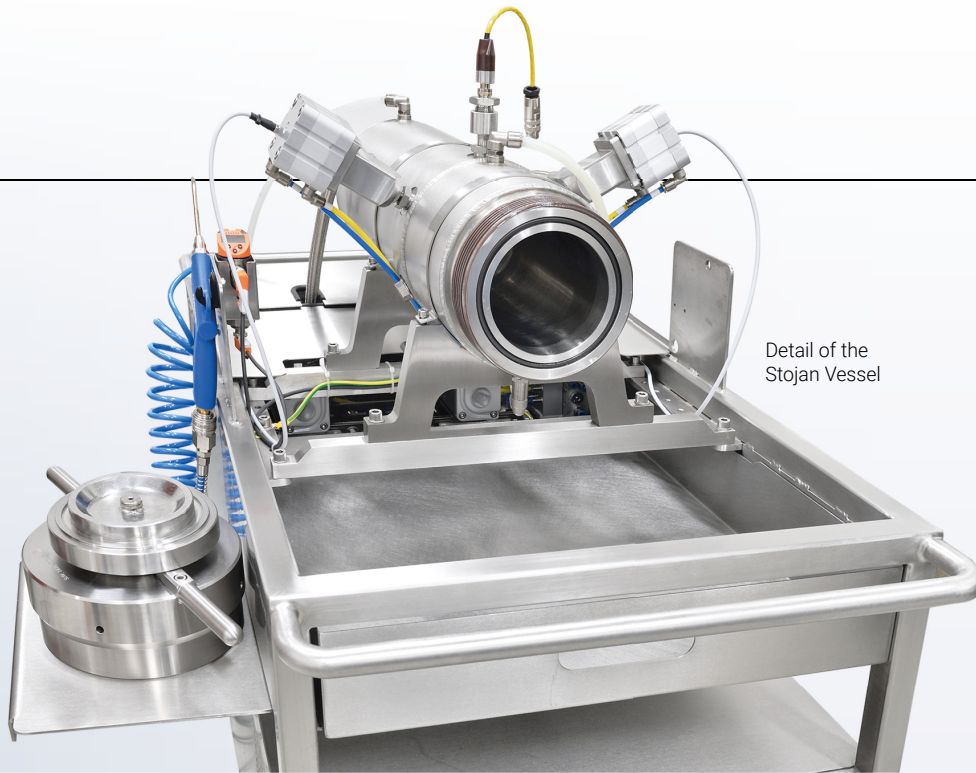
SV-2 Lid with a window (with CP mode only) and picture showing the test



Pressing tools



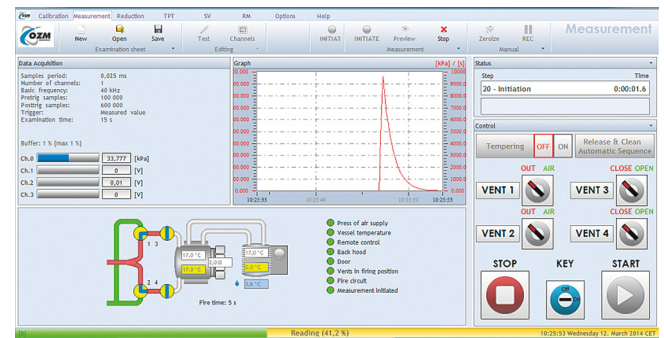
Stojan Vessel
on a movable stand



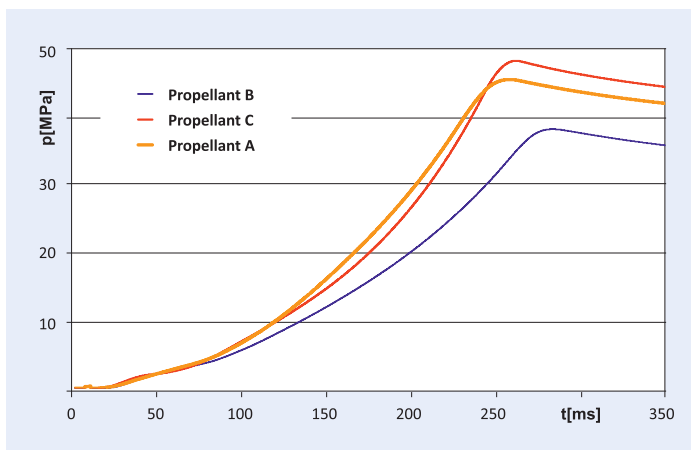
Detail of the Stojan Vessel

ADVANTAGES & FEATURES

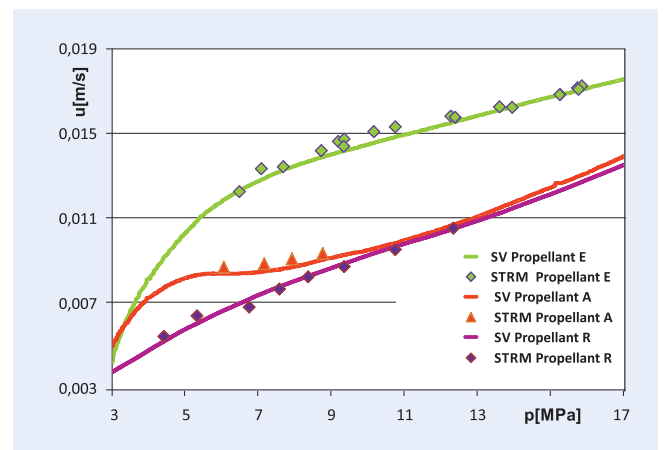
- ▶ Quick and safe operation, fully remote controlled
- ▶ Design of the stainless steel closed vessel allows for easy cleaning of composite propellants residues
- ▶ Working pressure up to 50 MPa
- ▶ 75 MPa proof pressure tested by burning solid propellants
- ▶ Compact mobile working trolley with in-built chiller
- ▶ Upgradable for Constant Pressure mode on demand
- ▶ Option of lid with a window (with CP mode only)



Measurement module with remote control section during data recording (after firing el. fuse-head)



Burning pressure (p) – time (t) dependencies measured using Stojan Vessel



Comparison of burning rate – pressure curves obtained by Stojan Vessel (line) and by Small-scale Testing Rocket Motor (points)



OZM Research s.r.o.

Bliznovice 32, 538 62 Hrochuv Tynec

CZECH REPUBLIC / European Union

Mobile: +420 778 456 409

E-mail: ozm@ozm.cz

www.ozm.cz