

# TORTECH<sup>®</sup>

## ELASTIC ENGINEERING OF NEW MILLENNIUM

### Description:

Tore Technologies (**TORTECH**) is a new chapter in engineering, namely the *elastic engineering*, which is similar to such natural process as peristalsis characterized by coordinated, highly efficient work of various muscles of digestive organ of a living organism.

Tore based devices were probably in use even in the ancient times. The elements of Egypt pyramids could be moved with **TORTECH** methods. Mechanical Engineering based on traditional kinematics of the previous centuries will certainly run down information technologies like Internet, which belong to the 21<sup>st</sup> century.

**TORTECH** is based on the usage of reversing supple, elastic toroidal shells available as degenerated (closed) tore, which can be shaped as a variety of modifications like hose turned inside out, cylindrical, co-axial, with knurled tube tore etc. The internal tore cavity can be filled with flowing medium. Tore can "operate" separately and/or in combination with a central body, internal and/or external peripheral bodies. Besides it is possible to integrate electronic components on the surface or into the structure of the material shell to provide the control over the tore mechanism (*elastic functional and/or integrated electronics*).

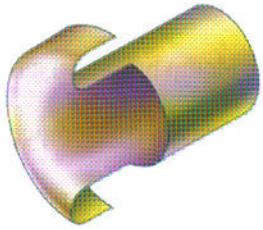
As the result of external forces applied to its outside surface or central part as well as internal excessive pressure in its cavity or the force of gravity, tore:

- moves and rolls on a rigid or elastic coupled surface, flowing around its deformed parts and foreign inclusions;
- self-seals over a closed contact surface enveloping it;
- produces little specific pressure on a bearing surface and high damping effect;
- produces pulling efforts;
- produces an impact effect;
- converts various types of motion, e.g. progressive motion into rotary one;
- grasps and pulls an object under controlled force of enveloping and fixing;
- pushes out an object embedded into it at controlled expulsion velocity and the height of fall;
- holds an object embedded into it;
- changes its initial form allowing the transformation of its contour (appearance) and fixing a new equilibrium form eliminating any "breaks" at the bending points;
- provides a hinged swing of at least one free end etc.

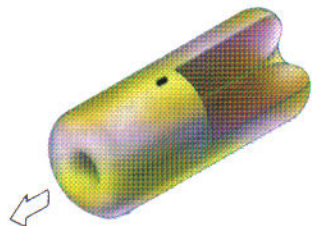
**TORTECH** allows to create quite original designs of such basic units of machines and mechanisms as: cylinder-piston, plunger stuffing-box seal, spring, damper, drive of a working member or machine, locking unit on a pipeline, controlling unit in pneumo- and hydro-systems, suction valve - pressure valve, pneumo- and hydro-distributor and switch, power converter, transporting unit, automatic controller of pressure, level, flow and so on, filtering unit and so on.

### Advantages:

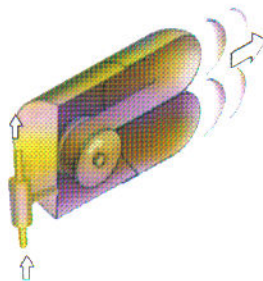
- high efficiency: sliding friction is replaced by rolling friction providing a "wheel" effect;
- tore as constructive element is universal and can be used in various machines and mechanisms;
- tore based mechanisms are easy to design, construct and process;
- high degree of universality of design elements;
- no necessity to organize new special manufactures;
- low power and materials consumption: traditional materials are replaced by shell material, reduced requirements for surface processing;
- flexible, easy to mount and operate, maintain and repair, particularly in extreme conditions;
- convenient transportation and storage;
- ecological purity;
- tore in devices and mechanisms can be used as consumables and so on.



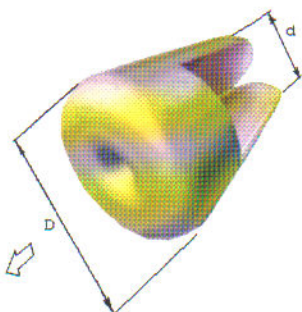
Cylindrical hose



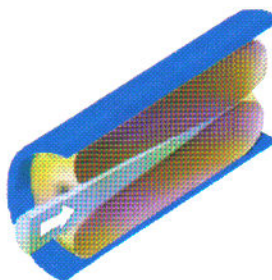
Cylindrical tore



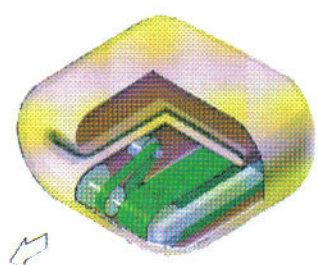
Hose turned inside out (half-tore)



Conical tore



Central and external peripheral body located outside the cavity of the torus - bearing surface (tube)



Internal peripheral body, e. g. reversed mechanisms located within the cavity of the tore



## **Application:**

**Transportation facilities** to operate heavy and large-size objects over the earth and water surfaces as well as under water.

**Rigging facilities** to operate heavy and large-size objects.

**Transportation facilities** with enhanced cross-country ability specifically designed to move over weak bearing surfaces under extreme conditions with specific pressure onto the bearing surface not greater than 10 000.0 Pa (0.1 kG/cm<sup>2</sup>) and pressure of flowing medium in shell not greater than 10 000.0 - 30 000.0 Pa (0.1 - 0.3 kG/cm<sup>2</sup>).

**Pipeline transportation facilities.**

**Multipurpose elastic toroidal containers** for storage, transportation, mobile loading/unloading of petroleum products, gaseous fuel and other flowing medium.

**Self-contained power stations** of various capacity converting the energy of waves and ocean tides, wind energy, temperature and pressure difference in the atmosphere and ocean.

**Pneumatic core casing** for fast erection of constructions, including those with complicated bionic shape, and **lifting mechanisms** to put it into operation; **Impact and depressing devices, pile pullers; Lifts; Facilities to erect masts and tower constructions; Press equipment** to shape preset roofing; **Support for pipeline mounting.**

**Technical facilities for handling carriers with silicon wafers in VLSI production; Technical facilities for transportation of reactive liquids; Units of cluster equipment.**

**Test and diagnostic stands** to determine the characteristics of materials of shells for simulation in torus devices and machines.

**Launching systems; Speed multipliers; Devices for in-flight fuel transfer; Docking systems; Transport systems for travelling on other planets; Landing systems; Rescue and life secure systems and so on.**

**New projects and technical means for circus performances, games, sport, attractions, TV-shows, advertisement, fantastic and animated movies, thrillers, computer graphics etc.**

**Medical tools for:** assisted respiration and cardiac massage; hemostasis and provisional bandages; immobilization of damaged parts of the body (fractures, dislocations) during transportation; emergency assistance in case of compression and crushing of limbs, at burns, frost-bitten, drowning etc; moving, carrying over and transporting of the victims (scaffolding and transportation); entrance and extrusion of various things to and from the human body; multi purpose suckers; hot water bags, urinals, multi purpose vessels, cups, thermostats, filters, altitude chambers etc, special beds and other medical means, sleeping bags, washing machines; trainers, massagers, special garments etc.

These tools can be used together with various medicine means, bandages, which can be incorporated into the material structure of the shell, central and peripheral bodies.

**"Spare parts" (prosthesis) for a human being arms legs etc - bio mechanics or robots' parts.**

**Self-intruded suppository, tablets, ampoule, pads etc.**

**Self-dressed clothes, shoes, covers, protective and camouflage stores.**

**The biggest (huge) thermometer, clock, barometer, display, panels video screen etc.** (worth mentioning in Guinness Book).

**Technological processes of delivering icebergs to the point of destination by means of torus technologies:** cutting, self-packaging (self crating etc.), supply to the shore, connection and attachment to the sucking equipment, pump over.

## **Some results:**

- designing of original mechanisms and machines;
- development of methods for conversion of the energy, for example, of gas into other kinds of energy (kinetic, electrical, mechanical) and devices for realization thereof;
- development of methods, diagnostic and testing stands for estimating properties of materials of elastic toroidal shells;
- manufacturing of operating (working models);
- a lot of materials for patenting etc.
- You can find more detailed information on our site: [www.tortech.moscow.ru](http://www.tortech.moscow.ru)



## **Dear Messieurs:**

We are now engaged in patenting our products and technologies of the 21<sup>st</sup> century based on **TORTECH**. We are pleased to offer a cooperation and expect your interest in it. We will appreciate very much additional information necessary for beginning joint work.

In case of yours interest we could propose joint work (with high efficiency and short terms of works) for developing, on the basis of **TORTECH**, specific equipment or/and separate units with technological parameters and price better than the counterparts and publishing of a series of books and lectures in English.

**TORTECH** was demonstrated on working models in a number of companies in USA, Europe, Asia, etc.

Best regards

Dr. Val & Nick Shikhirin