

#### COMPOSITE CLUSTER OF SAINT-PETERSBURG



# Composite Cluster of Saint-Petersburg as a factor of scientific and economic development



# Perspectives of the composite industry

The composite industry continues to <u>show an increase</u> in the rate of growth and its global market today is valued at approximately <u>\$ 70 billion</u>.

This growth is driven by a variety of industries, which pass from metal to use lighter products from composites. The most active sectors in the use of composites is expected to become the **medicine**, **defense**, **automotive**, **transportation systems, aerospace composite**, **shipbuilding** and **industrial production**.

## Strategic targets of Composite Cluster of Saint-Petersburg

- Composite Cluster of St. Petersburg was created in order to create centers of competence in the field of composite materials and their products, enhance the competitiveness of cluster members, creating an effective cooperative partner network defining activity Cluster and attracting new members to it and new markets.
- The basic idea of the Cluster is to provide the basic industries of St. Petersburg with modern high-tech composite products, the conversion of existing infrastructure technology platforms based on new solutions with the use of advanced composite materials and railway infrastructure.
- The priority areas for such technological transformation defined:
  - Shipbuilding
  - Construction
  - Housing and communal services
  - Transport infrastructure

- Energetics
- Transportation engineering
- Instrumentation
- Accomplishment
- Protective composite coatings



### Members of the Composite Cluster of St. Petersburg

- 1. JSC «Sredne-Nevsky shipbuilding plant» 2. FSUE «Krylovsky R&D center» 3. LLC "Plant for processing of plastics them. Komsomolskaya Pravda " 4. Institute of Macromolecular compounds RAS 5. LLC «Engeneering and Exploration Institute **SEVZAPMOSTROJECT**» 6. JSC "STC of Applied Nanotechnologies« 7. LLC "IK-technologies" 8. JSC «SMCB». 9. LLC «Kolpino Plant of Composite Materials» 10. LLC «Fronton+» 11. LLC «Panacea» 12. LLC " NPK Nanocomposite» 13. LLC «Petroplast» 14. JSC «Hyproribflot»

- 15. LLC «I-Pi-Group»
- 16. LLC «TOR Group»
- 17. LLC «NKT»
- 18. LLC "Vineta"
- 19. LLC «Composite Stone»
- 20. LLC «SK»
- 21. JSC «Plant Composite»
- 22. LLC «Flotenk»
- 23. SPP «Module»
- 24. LLC «Composite-Prof»
- 25. LLC «Osnova»
- 26. LLC «ICB»
- 27. LLC «ROSIZOLITE»
- 28. Ochtinskaya shipyard
- 29. Investment Consulting Agency
- 30. LLC «Plavbeton»
- 31. LLC «Steclonite»
- 32. LLC «Sintez Technology»

## The main products manufactured by members of the Composite Cluster of Saint-Petersburg

- Vessels from composite materials;
- Component parts for ships from composite materials;
- The composite fittings and other building materials made of glass, basalt, carbon or aramid fibers;
- Composite coatings and concrete;
- Products for housing and communal, including pipes for sewerage and water supply made of composite materials;
- Design and manufacture of special technical devices with desired properties of the polymeric materials of construction;
- Products for Railways.

## Bridges, pedestrian crossings and transport infrastructure elements with using of composite materials

In Russia, about 20% of overpasses and bridges are in poor condition.

#### The main advantages of composite materials:

- Reduced density and weight designs while retaining the strength characteristics;
- High corrosion resistance and climate;
- High strength and high resistance to the complete destruction;
- High resistance to fatigue;
- Low values of bulk and surface electrical conductivity;
- Durability;

## Bridges, pedestrian crossings and transport infrastructure elements with the use of composite materials





The bridge over the Volga River with the use of a special composite concrete Overpass across the road, made of composite materials

## Bridges and decks entirely of composite materials:

Compared to traditional supporting structures - they do not require painting, do not decay, are resistant to corrosion, fire-resistant, do not require maintenance for more than 5 years and are easy to assemble





# **Production of small passenger vessels from composite materials**

Today, the Russian river fleet consists of 9.5 thousand vessels with an average age above 30 years.

#### By 2020, 85-90% of the operating fleet is to be output.

#### Using vessels from composite materials:

**Technological effect:** to increase the safety and seaworthiness of the vessel, to reduce the resistance to movement of the vessel, to reduce body weight and reduce the need for power plant capacity.

**Economical effect:** will be expressed in the reduction of the construction cost of the vessel and the amount of operating costs.

# The project of the production of small passenger vessels from the composite materials







# *Composite pipes for heating mains and composite waste water trays.*







## Composite capacitive equipment for water treatment and chemical stations.









## Modern, durable, environmentally friendly and vandalproof products for urban amenities









• Products for Railways, Underground





• Products for power engineering, oil and gas production





<u>The Working Group</u> on the introduction of composite products for vessels of various purposes



ОБЪЕДИНЕННАЯ Судостроительная корпорация



## COMPOSITE CLUSTER OF SAINT-PETERSBURG

The largest Russian Shipbuilding Company, which includes both factories, research institutes and engeneering offices.

The task of the Working group is to compile a "Base of shipboard products", which are expedient to be made from a composite. Association of 33 companies, that manufacture and research composite materials and products from them.

## **Examples of using of composite materials in** shipbuilding in Russia



Minesweeper sheep "Alexander Obukhov" totally made of composite materials in "Sredne-Nevsky Shipbuilding plant", St. Petersburg



Non-carriage floating station of the project 2000, made in "Sredne-Nevsky Shipbuilding plant", St. Petersburg



Catamaran, fully made of composite materials in "Sredne-Nevsky Shipbuilding plant", St. Petersburg The Composite Cluster of Saint-Peterburg created the <u>Working Group</u> on the introduction of composite products <u>for Subsea Production Systems</u> for mining oil and gas from subsea.

The task of the Working group is the collection of proposals for the use of innovative composite materials and technologies for underwater development of natural resources on the sea shelf in the Arctic.

We are ready to cooperate with all companies that are ready to give their offers and localize production in Russia.

## Examples of using composites in Subsea Production Systems.







Cocoon-shaped protective covers of subassemblies of composite structures. More than 30 units in the North Sea. Used by Norwegian Company Aker Solutions.



*The 22-in. composite drilling riser is ready for offshore installation on Statoil's Heidrun TLP in the North Sea.* 



Composite risers, made by Matrix Composites & Engineering Ltd, Australia

# **Proposals for cooperation:**

1) Ready to cooperate with enterprises that produce <u>raw</u> <u>materials</u> for the production of composite materials,

2) Ready to cooperate with manufacturers of composites and research centers in the field of <u>**R & D**</u> and <u>joint</u> <u>developments</u>,

3) Ready to participate in *international technological projects,* 

4) We are looking for partners in the form of <u>Clusters</u> and <u>Associations</u> to launch joint projects and other forms of cooperation.

#### We invite interested organizations to take part in events.

- 1) Composite Cluster of St. Petersburg organizes the Round Table "Application of Innovative Materials and Technologies for the Underwater Development of Natural Resources on the Arctic Shelf" at the St. Petersburg International Economic Forum on June 2, 2017.
- 2) Composite Cluster of St. Petersburg organizes the «Conference on the development of production and use of composite materials and products from them in St. Petersburg» on November 12-14, 2017.



COMPOSITE CLUSTER OF SAINT-PETERSBURG

#### **THANK YOU FOR ATTENTION !**

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