

# BMG

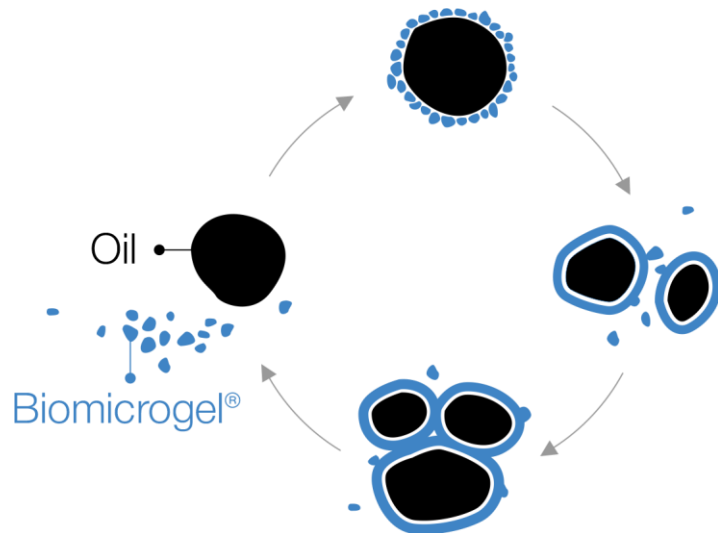
Biomicrogel<sup>®</sup> solutions for oil spill response

# WHAT IS BIOMICROGEL®

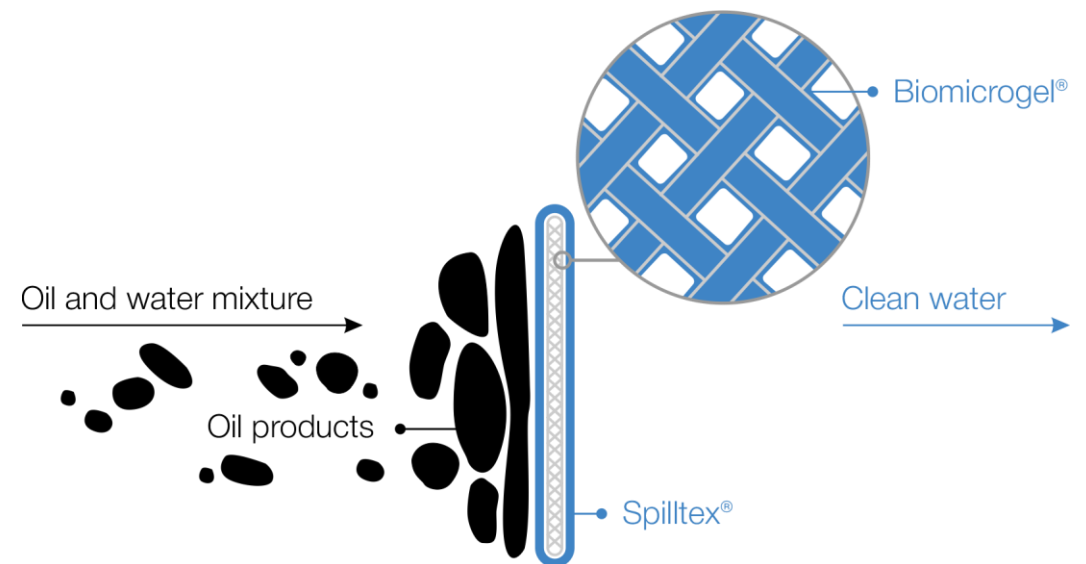
Biomicrogel® are submicron polysaccharide particles obtained from secondary agricultural products: apple and beet pectin.

Biomicrogel® efficiently capture mineral and vegetable oils, animal fats, crude oil and petroleum products from water-oil mixtures and emulsions.

## ENCAPSULATION PROCESS USING BIOMICROGEL® SORBENT



## SEPARATION OF OIL AND WATER MIXTURE USING SPILLTEX® MEMBRANE



# PROBLEM

**OIL SPILLS** – an urgent problem in the production, transportation, processing and storage of any type of oil products.

Oil spills lead to both direct costs (loss of a commercial product, environmental pollution) and indirect (downtime of equipment, inability to use the water area, etc.).

## OIL SPILL RESPONSE PROBLEMS:

- **Localization** - it is necessary to contain the spill as soon as possible in order to reduce the negative impact on the environment and the costs of eliminating the consequences
- **Reaction speed** - the more time passes since the spill, the more serious its consequences
- **Storage** of special equipment for liquidation **requires a lot of space**
- **Secondary** environment **pollution**
- The need for **the additional purification** of the collected water from oil products
- **Reputation losses** due to negative impact on the environment



# SOLUTION

## LOCALIZATION AND COLLECTION FROM THE SURFACE OF WATER OF THIN OIL FILMS

To eliminate the consequences of accidental oil spills in seawater and water with high hardness, the **Biomicrogel® BMG-P1** is used

### SPECIFICATIONS:

- Processing of oil products is possible both on water (thin films) and under water (pipe cracks, natural emissions of oil products)
- Sorbent application is performed using existing equipment (used for dispersant application)
- The principle of operation of the sorbent is the encapsulation of oil products, their transfer to a jelly-like state
- Sorption coefficient **1:50** (1 kg of dry product is required to collect 50 kg of oil products)
- After processing, oil products do not evaporate, do not burn, do not stick to animals, birds or infrastructure
- After processing, oil products are easy to collect from the water surface
- After collection, the **oil product can be recovered** and returned to the technological cycle, liquid solution of **sorbent is reusable** as well



## PREPARATION OF WORKING SOLUTION

Sorbent **Biomicrogels® BMG-P1** should be diluted in water to a solution with a concentration of 1.0-2.0%, using a static mixer or other suitable mixing equipment that allows you to make a homogeneous solution.

## APPLICATION

Sorbent **Biomicrogels® BMG-P1** is applied to the water surface using sprayer. Then gelled contamination is removed from the water surface by any available mechanical devices or trash collectors.

The **Biomicrogels® BMG-P1** sorbent breaks the surface layer of oil products and encapsulates the oil products inside the **Biomicrogels®** shell. Encapsulation occurs due to a change in the charge of an electric double layer on the surface of oil products. The oil contamination is enclosed in a shell that holds the contamination inside.

Biomicrogel company can provide recommendations on the necessary preparation and dosage of BMG-P1.

## HOW TO MEASURE RESULTS

Visual assessment. Absence of a film of oils and petroleum products on the water surface.

## STORAGE

Store the product in a cool, dry place. All protective packaging should be retained before using the product.

The guaranteed shelf life in dry form is 24 months from the date of manufacture.

## DISPOSAL

Dispose the collected waste sorbent **Biomicrogels® BMG-P1** with oil products encapsulated in accordance with applicable law.



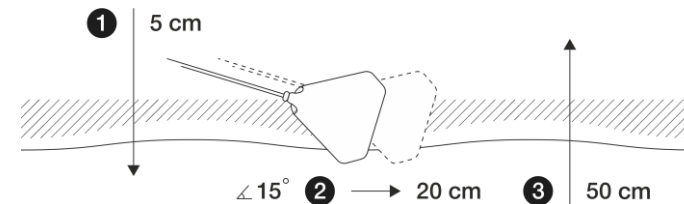
# SOLUTION

## OIL SPILL COLLECTING SCOOP SPILLTEX® TO COLLECT OIL PRODUCTS FROM SURFACE OF WATER

It is a convenient portable design, consisting of lightweight, durable folding equipment with a telescopic handle with a fixed working surface made of Spilltex® membrane that allows water to pass through and holds any oils and oil products (diesel fuel, gasoline, oil, etc.).

Parameter	Spilltex® scoop
Filtering surface area, m <sup>2</sup>	0,16
Oil collecting capacity, l/h	up to 100
Membrane resource: <ul style="list-style-type: none"><li>• for the collected oil products, l</li><li>• For separated water, l</li><li>• The number of scoops, times</li></ul>	580 5800 1000
Number of cycles*	up to 20
Degree of purification, %	up to 99
Scoop assembly length, m	1,6-2,5
Length of telescopic handle, m	1,2-2,0
Folded dimensions (L×W×H), m	1,2×0,2×0,5

### HOW TO USE SPILLTEX® SCOOPS WHEN COLLECTING OIL PRODUCTS FROM THE WATER SURFACE



\*Use cycle – sequential activation, application and regeneration in accordance with instruction of usage

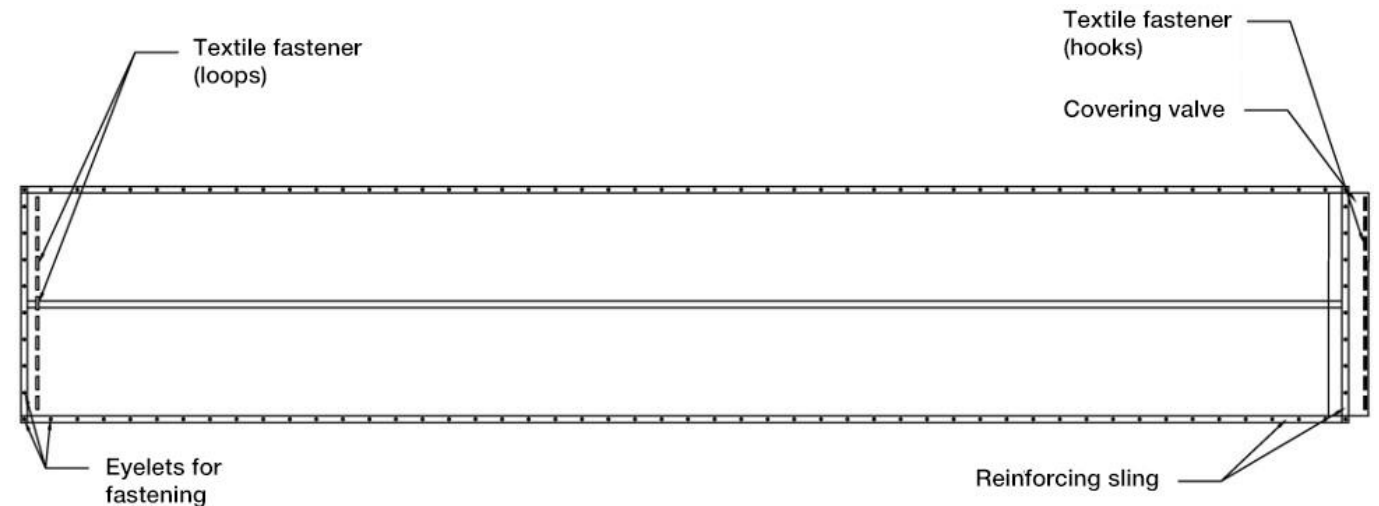
# SOLUTION

## PREVENTION OF SPREADING, PROTECTING THE SHORELINE AND OTHER FACILITIES FROM OIL STICKING

Universal filter cloth Spilltex<sup>®</sup>, is a cloth consisting of a membrane with eyelets for fastening around the perimeter and a valve on the short side for docking with the same filter cloths to increase the length.

Universal filter cloth Spilltex<sup>®</sup>, allows water to pass through and holds any oil products (diesel fuel, gasoline, oil, etc.), can be used to protect the coastal zone, infrastructure objects, increasing the boom's depth to prevent oil products breakthrough under the boom, to set up protective barriers on small streams and shallow rivers with a flow rate of no more than 0,5 m/sec and so on.

Parameter	Spilltex <sup>®</sup> universal filtering cloth
Filtering surface area, m <sup>2</sup>	18
Filter cloth lifetime after installation	up to 336 hours
Degree of purification, %	up to 99
Size (L×H), m	10×1,8



# SOLUTION

FOR ELIMINATION OF EMERGENCY SPILLS OF OIL PRODUCTS USING BIOMICROGEL® REAGENTS AND SPILLTEX® MEMBRANES

Using Spilltex® membranes in elimination of consequences of emergency oil spill





# SOLUTION IMPLEMENTATION RESULTS

## POST IMPLEMENTATION PROCESS KEY INDICATORS

Parameter	Value
Oil products	<0,05 mg/l

## BENEFITS / ADVANTAGES OF IMPLEMENTATION:




- **environmental friendliness** - all products are made from natural ingredients and do not negatively affect the entire environment
- **no secondary pollution**
- **compactness** - solutions can be placed in the required quantity for emergency deployment at the emergency site
- **return of collected oil products** to the production cycle
- **reusability of products**
- **flexibility** - the ability to apply where standard solutions (booms, skimmers, dispersants) are impractical
- **low unit cost** of oil spill elimination

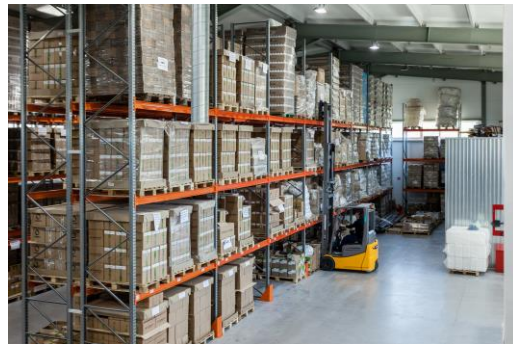


THEY ARE WORKING WITH US:



# ABOUT THE COMPANY

-  Biomicrogel Company is the first Russian innovative company-developer and manufacturer of microgel-based products from natural raw materials: apple and beet pectin, cellulose.
-  Developer and patent holder of solutions based on microgels under the brand **Biomicrogel®** (>60 patents, >50 countries)
-  2 production sites, 4 own chemical laboratories and experimental facility.  
Own R&D center consisting of highly qualified specialists in the field of organic synthesis and polymer chemistry, engineering department and technical support.



# ACCLAIM

- 2019**    Winners of the Poland Prize Accelerator in Warsaw  
Seal of Excellence from the European Commission  
FAMAE Precious Water Challenge Top 100 Semi-Finalist
- 2016**    Horizon 2020 SME Instrument grant from the European Commission  
Finalists in the MassChallenge UK 2016 Accelerator  
Finalists in the South Summit Startup Competition 2016
- 2015**    Selected among 100 participants at the SLUSH Innovation Forum in Helsinki, Finland in 2015
- 2014**    Runner-up in the 2014 Cleantech Open Global Ideas Exhibitors in the Agriculture, Water and Waste category  
Nominated start-up for Falling Walls Science Start-up of the Year 2014



# ALL BMG PRODUCTS

- [Biomicrogel® BMG-P1 sorbent](#)
- [Biomicrogel® BMG-P2 coagulant](#)
- [Biomicrogel® BMG-C2 flocculant](#)
- [Biomicrogel® BMG-C3 soil and sand cleaning agent](#)
- [Biomicrogel® BMG-C4 oil extraction agent](#)
- [Biomicrogel® BMG-C6 solid surface cleaning agent](#)
- [Spilltex® dip net for petroleum products collection from water surface](#)
- [Spilltex® filter cloth for laying sumps](#)
- [Spilltex® filter barrier cloth for shallow rivers](#)
- [Spilltex® universal filter cloth](#)

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# ALL BMG SOLUTIONS

- [Industrial and storm drains cleanup from oils, fats and petroleum products](#)
- [Coolant processing in metallurgy and pipe rolling](#)
- [Coolant processing in mechanical engineering](#)
- [Performance gains in vegetable oil extraction](#)
- [Oil and petroleum product spill cleanup](#)
- [Clean up of solid surfaces from oils and petroleum products](#)
- [Soil washing from petroleum products](#)
- [Purification of bottom and produced water](#)

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# CONTACT DETAILS

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