

Termo-Rex S.A. and ZUMIR

MICROSPHERES

Agenda

- ▶ 1. Introduction.
- ▶ 2. Definition of microspheres, their properties and applications.
- ▶ 3. Obtaining and processing of microspheres.
- ▶ 4. Company details.
- ▶ 5. Offer.
- ▶ 6. Contact.



INTRODUCTION

ZUMiR

The Consortium formed by companies Termo-Rex S.A. and Przedsiębiorstwo Usług Melioracyjnych i Rekultywacyjnych ZUMiR would like to present you with the **offer for delivery of dried and fractionated microspheres to your markets.**

Each year, we deliver from 10 to 12 tons of dry microspheres to both domestic and foreign markets.

The Company **ZUMIR** specializes in obtaining, processing and sale of microspheres for more than 20 years.

Whereas the **Company Termo-Rex S.A.** is a supplier of wet microspheres.

Our assets are long-term process experience, highly specialized production facilities and experienced employees with many years of experience. Owing to the same we are pleased to offer a product of the highest quality.

We are a trustworthy and reliable partner.

DEFINITION OF MICROSPHERES, THEIR PROPERTIES AND APPLICATIONS

Microspheres are small, spherical polymer particles filled with gas. They are classified into light fraction of aluminosilicates present in fly ash and furnace slag formed during conventional combustion of hard coal. The essential determinant of microsphere formation is a gas release from mineral substances in high temperatures. Main ingredients of the microsphere solid phase are silicon and aluminum oxides and in smaller quantities - iron, magnesium and calcium oxides. Gaseous phase consists mainly of CO_2 , N_2 and CO .

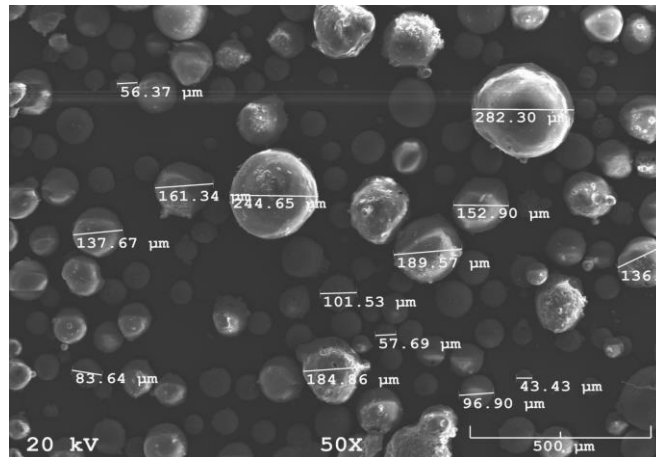


Photo 1. Microspheres - scanning microscope - zoom: 50x

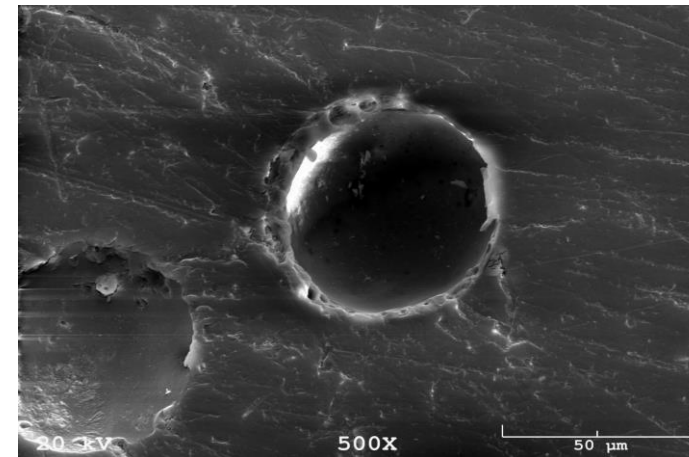


Photo 2. Single sphere - scanning microscope - zoom: 500x

PROPERTIES

Microspheres have unique physical and chemical properties:

- low density [0.2 - 0.8 g/cm³],
- high mechanical strength [210 - 350 kg/cm²],
- low heat penetration coefficient [0.1 - 0.2 W/mK],
- high melting temperature - [1495 ± 10° C],
- high thermal stability - [1000 - 1450° C], and additionally:

- high resistance to aggressive chemicals,
- low calcination losses,
- low bulk density.

APPLICATION

These features make microspheres a state-of-the-art material used in various industries. Their present usage is mainly related to:

- manufacture of light fillers for polymers,
- manufacture of refractory materials, paints and coatings,
- manufacture of construction materials,
- oil and gas production in drilling industry,
- in pharmaceutical industry,
- in cosmetology and medicine.

OBTAINING AND PROCESSING OF MICROSPHERES

Microspheres are stored together with the entire stream of furnace waste inside sedimentation tanks or lagoons towards which the hydrated mass of ash and slag mixture is being transported through pipelines. Since they float on the water surface owing to their low density, the **process of their production includes the following steps:**

- collecting a specific amount in one place by means of floating barriers,
- induction of the flotation process in order to separate them from other ingredients of the mixtures,
- pumping the material out of the sedimentation tank,
- filtration using bag separators and returning the cleaned water into the sedimentation tank.



PROCESSING

After pumping out of the tank, the microspheres packed into big bags are transported to the processing plant where they are dried with hot air stream in temperature ranging from 130 to 150°C, and, afterwards, are sorted by means of screen sets into several main grain sizes:

0 to 120 µm

120 - 160 µm

160 - 320 µm

320 - 500 µm



SHORT INFORMATION ABOUT THE CONSORTIUM

ZUMIR

Apart from the core business which is obtaining and processing of microspheres the company also recovers and reclaims other types of industrial waste generated during hard coal combustion processes used in the power sector. These are, among others, ash mixed with slag, slag or flying ash, used in construction industry, for site grading and land reinstatement of degraded areas, and for other applications.

Termo-Rex S.A

Is the biggest company in Poland specializing in heat treatment of steel components and manufacturing of resistance heating equipment and professional equipment for heat treatment. We have been operating on domestic and European markets for almost 20 years.

For several years now the company has been obtaining microspheres from the sedimentation tanks.

Since 2012 the company Termo-Rex S.A. is listed on the Warsaw Stock Exchange.

DELIVERIES

- ▶ The product is packed into 20 kg paper bags or 500 kg big bags. We put the amount of 1000 kg on the 100 x 120 cm pallet and we protect the product with a shrink wrap. We load 22 tons of the microspheres on a standard 13.5 x 2.7 trailer. We load about 20 tons of the material inside 40' containers.
- ▶ All the goods are delivered to our customers in accordance with INCOTERMS-2000.
- ▶ Along with each lot of the delivered goods we provide the results of laboratory tests and analyses performed by an accredited laboratory.

CONTACT



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