With SAR TASH®, dust and ash will be welcome anywhere

Lightweight Aggregate (LA) Production Technology at a Temperature from 10°C

Lightweight Artificial Aggregates (LA), namely SAR TASH®, its production, and use.

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SAR TASH® LA is designed mainly for the production of

- Thermal Insulation Concrete
- Lightweight Structural Concrete with a dense structure
- Lightweight Concrete with an interstitial structure

Shape, density, and size of the produced SAR TASH® LA

- SAR TASH® LA can be made with a round-surface or with an irregular (crashed) surface
- The density of SAR TASH® LA can be adapted to the conditions of use - the building structures, it´s regulable (with a minimum value from 450 kg/m^3)
- SAR TASH® LA can be produced in various fractions from 1 mm up to tens of millimeters.

1 *- Fraction 1/2*

2 - Fraction 2/4

3 - Fraction 4/8

4

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4 - Fraction 10/20

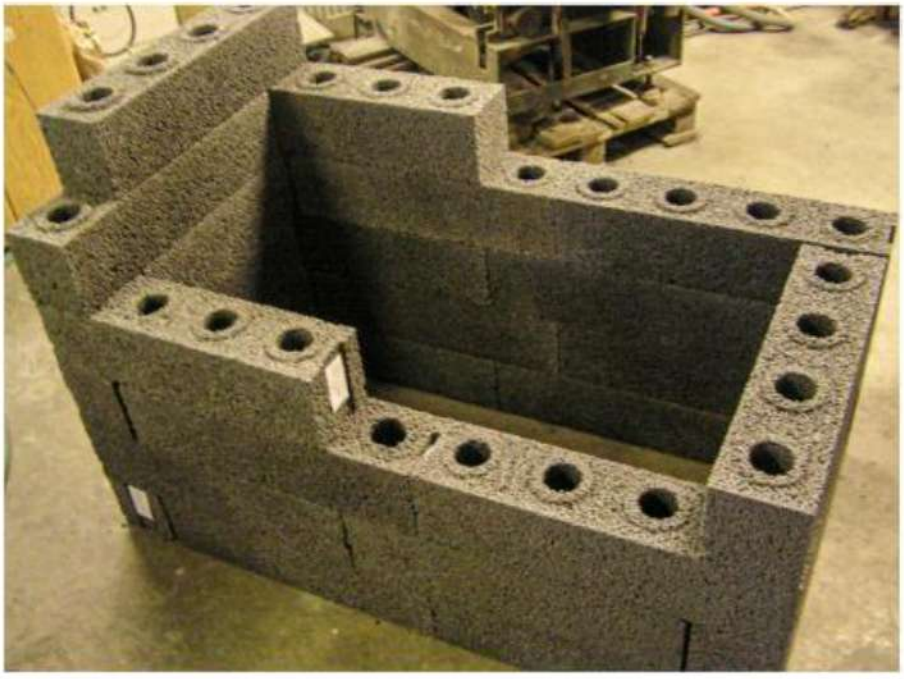
Application - use of SAR TASH® LA in the production of construction elements

- LA is **handled similar** to **natural aggregates** in the mix design.
- LA does **not require** any **special equipment in the building industry** (it is only about the change of used standard aggregates)
- Suitable **admixtures** modify characteristics of the fresh mix **like** in the **ordinary concrete or grout** and hardened products.

Example of manufacturing masonry blocks from SAR TASH® LA

The LA fittings are lighter than classic concrete fittings, while they excel in better thermal and noise-insulating properties. The fittings can be produced on conventional equipment.

Partition block production with lightweight artificial aggregate (by ADLER device)



- LA Blocks for Dry Masonry/DMB (Lightweight Interstitial Concrete with LA)

Main advantages of our methods of SAR TASH® LA production:

1. It is possible to **produce** it essentially **anywhere**. When compared to other types of lightweight aggregate (expanded clay) like, e.g. Keramzit (Liapor, Leka, etc.) produced by roasting fusible, swelling clay ores along with slightly swelling clay ores and additives at a very high temperature, the production of our LA is not dependent on the occurrence of special natural raw materials on the site. **Regional production** & **regional consumption** => **low transport costs and wide use.**

2. Our **SAR TASH® LA solidifies under natural conditions (already from 10°C)**, therefore, its production does not consume as much energy as, for example, the production of Keramzit.

3. Very convenient and effective **method** to **utilize fine inorganic waste materials**, such as dust particles, e.g., from processing stone, from various filters, fly ash, blast furnace slag, and the like.

Ecology

Lightweight artificial aggregate fully **replaces limited sources** of **natural aggregates** and thuscontributes to the reduction of consumption of non-renewable natural resources.

At the same time may solve the **processing** of **secondary raw materials very effectively at natural temperatures**, so the entire production process is **energy efficient**.

It is one of the few technologies that is advantageous for **reducing carbon dioxide emissions,** in the building industry.

Our Method of Waste Processing

Benefits of Our Method of Waste Processing

- Our **modern technologies** as much as possible **utilize** the **hidden potential** of **wastes** and their processing is used in various industries, mainly in the building industry.
- Intended **processing of inorganic waste saves expenses** to those who generate it (direct payments fordumping, storage cost, operating staff, administration …).
- **The processes** we designed **do allow controlled waste processing** and production of required **Products** with predetermined, even **exceptional properties**.

Are you struggling with flue dust, sludge, stone dust, and other dusty wastes?

Is it difficult and costly?
How to Convert Expenses to Profit?

Do make from Wastes lightweight aggregates SAR TASH® and Start Profiting from Wastes!

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LA from Waste Materials

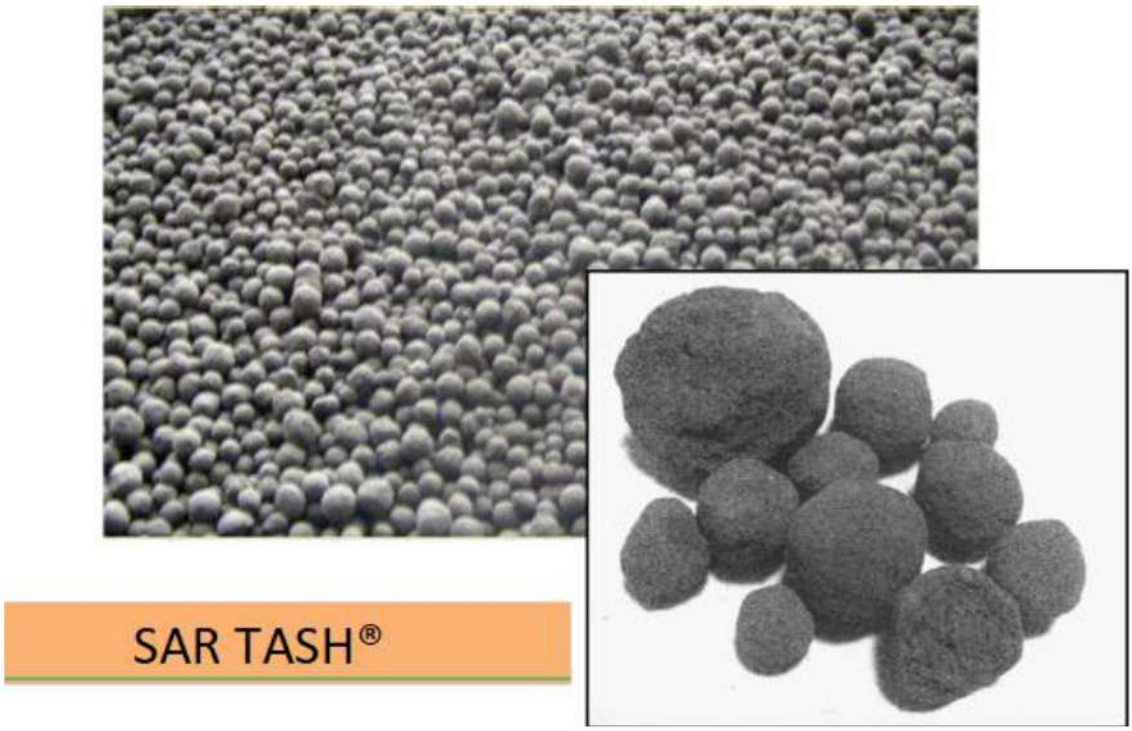
I. Lightweight artificial Aggregate

- Artificial aggregate SAR TASH® is produced according to our technology by mixing and subsequent hardening of a mixture made from dusty inorganic waste materials, our recommended binders, additives, admixtures, and water.
- Artificial aggregate SAR TASH® is produced by simple and flexible (mobile) production equipment, which does not require any construction permit or environment impact assessment (E.I.A).

The Most Suitable Solution

Lightweight artificial aggregate is produced with:

1. The **lowest possible energy cost** at the temperature **from 10°C**
2. Controlled bulk density **from 450 – 1000 kg/m^3** and corresponding strength
3. **Wide range of mechanical-physical characteristics,** which can be intentionally controlled based on the properties of input components and **customer requirements**, according to **our formulas**



The Most Suitable Form

Example of Lightweight Artificial Aggregate Made of Brown-Coal Fly Ash

Fly ash	Fly ash bulk density	Amount of flue dust per m^3	Bulk density of dry artificial aggregate	Strength
	kg/m^3	kg	kg/m^3	MPa
TST, a.s.	620	527	**650**	4
TST, a.s.	620	602	**750**	5
Reftinsk GRES	720	634	**780**	7.2

II. Light Porous Aggregate

- Production of light porous artificial aggregate enables utilization of a wide range of dusty waste materials
- **Portion of waste materials** –the total amount of incoming dry components of the porous aggregate is **80-93%**
- Controllable bulk density **is from 300 kg/m^3**
- Light porous artificial aggregate brings about **low production cost**, simple manufacturing, and quality **even at 10°C!**
- Production by (mobile) equipment is flexible, processing regional waste (fly ash, flue dust, dust, slag, and various sludge)

Light Artificial Aggregate Made of Dusty Inorganic Waste

Light Porous Artificial Aggregate

Example of Light Artificial Aggregate Parameters Made of Stone Flue Dust

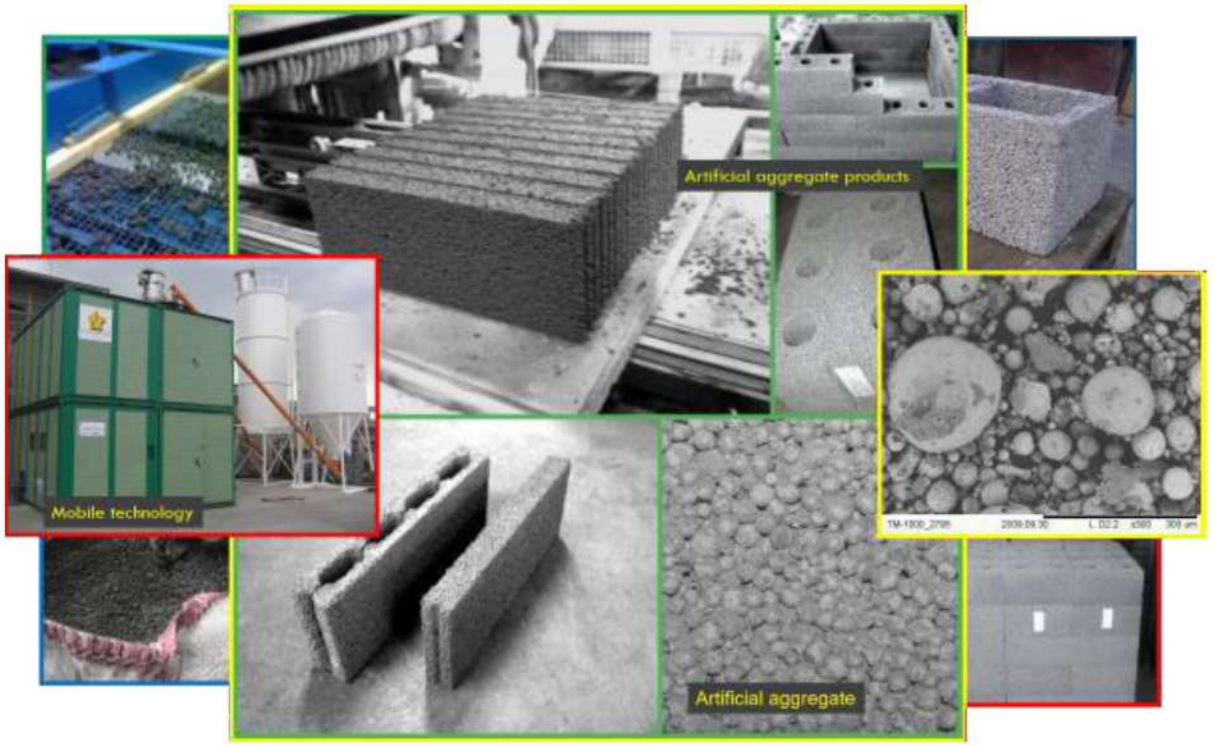
Type of stone flue dust	Amount of flue dust per m^3	Strength	Bulk density of dry artificial aggregate	Production temperature
	kg	MPa	kg/m^3	°C
granodiorite	578	2.5	**650**	10
granodiorite	440	1.5	**540**	10
greywacke	589	2	**670**	10

Comparison of LA to Alternative Products (Expanded Materials)

Name	Share of waste materials (%)	Size of aggregates d (mm)	Range of heap density ρ_s (kg/m3)	Range of resistance to smashing (strengths) C_A (MPa)	Production temperature (°C)
SAR TASH	85 - 100	4 / 8	500 - 1200	2 - 20	10
	85 - 100	8 / 16	300 - 1000	1 - 12	10
SioPor (Expanded Ceramic)	0	0,1 / 1	120 - 160	0,08	300
	0	0,63 / 2,5	60 - 100	0,03	300
	0	2,5 / 4	60 - 80	0,01	300
Poraver (Expanded Glass)	100	2/4, 4/8	145 - 230	1,3	900
LIAPOR (Expanded Clay)	0	4 / 8	450	1,7	>1100
	0	8 / 16	275	0,6	>1100

Complex and Simple Application of our technology in the Building Industry

- Mobile technology for the production of LA from inorganic waste materials
- LA enables the production of building **elements** with **advanced properties**



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The production technology of Inorganic Waste Materials

The **size** (number of containers) and the **installed technology** (machinery) of the production plant **Differs** mainly due to:

- The production **capacity** of the plant
- And sorts of input components and the purpose of using the final product

Example of the Mobile production plant for lightweight artificial aggregate SAR TASH®

- High mobility and modularity of the production plant
- Reliability of the equipment production
- And the installation of mobile technology for the production of artificial aggregate on any spot

The mobile technology for LA production

The mobile assorting line for LA

The production technology in the mobile version - the facility in operation

From Waste to Profit

- Waste = the cheapest raw material for now
- Possibility of combination with other technological wastes for new products production
- The lowest energy cost
- Simple operating
- Regional activity
- Immediate engagement
- The lowest achievable production cost

Send us samples of your dusty wastes for testing, we will design the best technology and formula for you

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study development

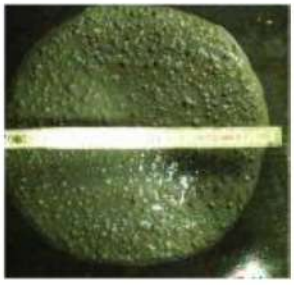
effective mobile technology

mass use of waste

the international cooperation

wide range of applications

quality products



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Use of LA in the Construction Industry

SAR TASH® - lightweight artificial aggregate is mainly used for theproduction of lightweight concrete or for backfilling.

- It is supplied in spherical or irregular form
- In fractions 0/2, 2/4, (alternatively 0/4), 4/8, and 8/16.
- Bulk density from 300 kg/m^3
- High strength from 1.5mpa (high resistance to crushing CA)
- Very good and fast absorbency, which allows the product to be applied immediately to concrete or mortar mix without changing the consistency
- Non-combustible material

Wide range of applications

Depending on the type of input components, **SAR TASH®** LA can be used for a wide range of applications and production of the following building materials:

- Light dense concretes with a bulk density from 1400 kg/m^3
- Light interstitial concretes with a bulk density of 900 kg/m^3 (masonry blocks for bearing andpartition walls, plates/boards, lintels, panels,...)
- Self-levelling materials
- Backfills and levelling layers for dry floors

Transport and handling

The material is transported in bulk or in bulk bags (type BIGBAG) that can be easily unloaded from the truck to the desired location with a hydraulic arm.

Production of panels

The thickness of lightweight self-compacting concrete, with 20 centimeters a bulk density of (I.)1750 kg/m^3 and (II.)1980 kg/m^3, both of them contain the LA.

6 - ***Production of panels*** *20cm thick of lightweight self-compacting concrete with a density of (**I.**) **1750**kg/m^3 containing LA*

7 - ***Production of panels*** *20cm thick of (**II.**) Self-compacting concrete with a density of **1980**kg/m^3 containing*

Lightweight Interstitial Concrete

Using SAR TASH® LA for the production of Masonry blocks with a bulk density from **900**kg/m^3

8 ***Production*** *of Masonry* ***blocks*** *with a bulk density from* ***900****kg/m^3*

9 *- **Production** of Masonry **Blocks for Dry Masonry** (DMB) with a density of **1050**kg/m^3*

Interstitial Concrete is used for:

- Production of Concrete Masonry Units (CMU) / Blocks for structural and partition walls
- Production of elements for panel walls
- Production of thermal insulation materials
- Production of sound insulation materials

Self-levelling compound using SAR TASH® artificial aggregate with a density of 1050kg/m^3 for levelling floors

- Self-levelling compound with the use of artificial aggregate SAR TASH® (bulk density 1050 kg /m^3) with use for levelling floors.

Building System based on Elements Containing the LA

In order to make **optimal use** of the properties of **lightweight artificial aggregate** (**LA**) for the **construction of buildings** as well as to **speed up construction**, the **Panel Building Construction System** named **Lkbox** has been developed that has been proofed by building several houses in the Czech Republic.

Wall panels - a combination of dense concrete with interstitial concrete are lighter, have greater vapor permeability, and good handle.

All the construction elements contain **LA**.

Artificial aggregate can also be used to install dry floors and levelling.

Remark:

Application - use of LA in the production of construction elements does not require any special equipment.

Photos below of realization one of the construction projects with large-scale elements that contain LA:


samro

Lkbox is Fast & Economic Construction of Buildings in a Modular Design and Arrangement

The Offer to Investors, Developers, Municipal and City Authorities

The Most Beneficial Buildings with large-scale elements containing LA

- Residential House
- Starting Apartments
- Nursing Homes
- Administrative Buildings
- Municipal Offices
- Schools, Kindergartens

- Modular System Of Wall Elements
- Quick Gross Building Construction
- Weather Independence

In order to streamline the design and production of the LA panels and also streamline the construction of houses, Type Construction Projects of Houses have been prepared.

Specifically, the house above was built in several layout versions with the same composition of panels in various regions of the Czech Republic.

LkBOX

BYTOVÉ DOMY
TYPOVÝ PROJEKT

Zastavěná plocha: 214 m2
V objektu 4 - 8 bytů s výměrou 40 - 98 m2 (1 - 3 + kk)

Doba výstavby:
- Hrubá stavba včetně základů a střechy: 3 týdny
- Celková doba výstavby na klíč: 3 až 4 měsíce

LKBOX

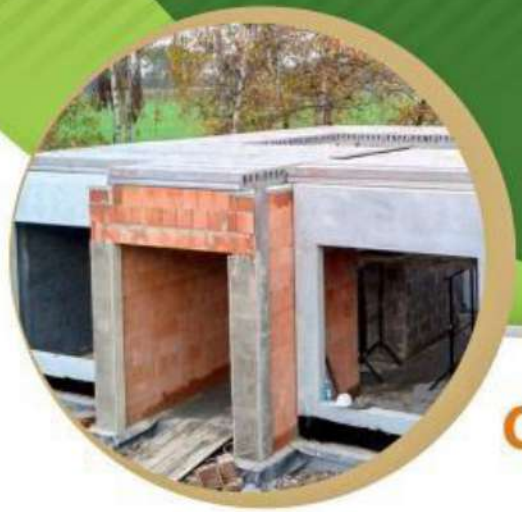
Bytové domy Rudná

Zastavěná plocha 449 m2

V objektu 16 bytů 1 + kk - 3+ kk ve 3 podlažích,
užitná plocha 1279 m2, komerční prostory 142 m2

Doba výstavby: **Hrubá stavba vč. základů a střechy: 6 týdnů**

LkBOX



Obecní úřad Němčice

Zastavěná plocha 193,01 m2

Přízemí (I. NP)
1. Zasedací místnost: 83,96 m2
2. Sociální zařízení: 23,59 m2
3. Ostatní: 78,58 m2 (vstupní prostor, schodiště, výtah, zázemí)

Podkroví (II. NP)
1. Kancelářské prostory: 101,99 m2
2. Sociální zařízení 23,59 m2
3. Ostatní (chodby, schodiště, výtah) 59,23 m2

Doba výstavby hrubé stavby: 5 dnů

Thank you for your attention!

Let dUSt be useful.

The SAR TASH® Consortium

EKOSTAT, a.s. / EKOGEN, z.s. / P.K. Invest, s.r.o. / MAGMA TRADE, s.r.o.

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PS: *What SAR TASH means is the Royal Stone, which we hope you have recognized in it too.*