iJET EXPLORE International Journal of Engineering & Technology
CENTRE OF PROFESSIONAL RESEARCH PUBLICATIONS
ISSN 2049-3444

International Journal of Engineering and Technology Volume 2 No. 5, May, 2012

Distribution Optiminizing Particle Size of Quartz Sand in "XELLA" Factory in Kosovo

Hyseni.S[1], Kelmendi.M[1], Durmishaj.B[1],Tahiri.I[1] , Operta.M[2]
[1]University of Prishtina, Faculty of Geosciencs & Technology, Mitrovice, Kosovo
[2] University of Sarajevo, Faculty of Science, Department of Geography

ABSTRACT

In this paper we presented a summary of the optimum technological parameters of quartz sand, during the manufacturing process of silicate blocks. The goal of this paper is the analytical determination of optimal parameters particle size distribution of quartz sand grain, which affects the overall production process. According to data shown particle size possibility to determine the area of sands for use of block and brick manufacturing silicate. It is worth mentioning that it comes with a first product of its kind in Kosovo.

Keywords- *quartz sand, distribution, optiminizing, reserve, Kosovo*

I. INTRODUCTION

Kosovo is situated in the central part of the Balkan Peninsula. In the Southwest, it is bordered by Albania, in the West by Montenegro, in the North and East by Serbia and in the Southeast by Macedonia. The territory extends within longitudes N41^{0}50'58" and 43^{0}15'42"and within latitudes E20^{0}01'30"and 21^{0}48'02".

Kosovo covers a surface area of 10,887 km^2. It is characterized by an average altitude of 800 m above (Figure. l), but shows considerable changes in relief and morphology of terrain[4,5]

Figure.1: Geographic map of Kosovo 1: 1,000,000

2. GEOLOGY OF MINERAL DEPOSIT

The sand deposit Mirosale is located approx. 9 km NE of Ferizaj, 1 km NW of the village. It was investigated in 1965, 1974, 1982 and 2003, when 59 boreholes were drilled with an average final depth of ca. 22 m. can be assessed as explored in detail [2]. The bedrock of this lacustrine deposit consists of an interbedding of reddish yellow fine grained sand (thickness:3 to 5 m) and beige colored sandy silt, strongly gravel-bearing sand and strongly silty fine sand (thickness:1 to 3 m). The average thickness of the exploitable material is about 7 m. Some interesting sedimentary structures (wave bedding, desiccation cracks, and palaeo-soils) can be observed Figure 2), the sand deposit Mirosale is of Pliocene age. By laboratory tests, an average SiO_2 content of 95 % was determined [3]. The exact starting date of the mining activities is unknown, but was certainly in the 1980s. The mining of the quartz sand deposit Mirosale is now operated by the company Silicapor. At the bottom, the sand pit is limited by the groundwater level. Until now, only dry extraction has been applied and the material is only used for the production of lime-silica bricks. The remaining reserves (explored in detail) are about 1.8 Mill [2,3,4].

Table.1

Ordinal number	Analysis elements	Bore hole [%]
1	SiO_2	88.06
2	TiO_2	0.42
3	Al_2O_3	5.64
4	Fe_2O_3	1.14
5	MnO	<0.06
6	MgO	0.21
7	CaO	0.26
8	Na_2O	0.95
9	K_2O	1.64
10	P_2O_5	<0.06
11	CO_2	0.15
12	SO_3	0.15
13	H_2O	1.05
14	Losses of ignition	1.19

ISSN: 2049-3444 © 2012 – IJET Publications UK. All rights reserved.

Figure.2: Profile of Sand Deposit in Mirosale

3. CHEMICAL ANALYSIS OF QUARTZ SAND

Chemical analysis was sent to Germany in the laboratory "Rhine Ruhr GmbH Kalksandstein Baustoffwerk Wankum Laborleitung, where it is analyzed and tested quartz sand. During the chemical analysis were analyzed 14 parameters, table.1. Evidence obtained from drilling samples and according to the results seen that the SiO_2 content is quite high over 88 %. The other parameters are in brick production limits and other products [2].

4. DISTRIBUTION OPTIMIZING PARTICLE SIZE OF QUARTZ SAND

Grain composition is an important physical indicator of sand, which is determined by the content of granules in raw materials. The distribution of sand grain size is the main factor in the production and properties of silicate bricks and blocks of quartz sand and lime [1]. In principle it can be said that a steady line of sand granules (balanced participation) and fine fractions, medium and coarse granulate enables appropriate (figure.3). Here are presented four types of granules the sand for the production of silicate bricks and blocks. In the first case we (figure.3a) have the unfavorable structure, the absence of the granules of the sand that would make the connection. In the second case we have unfavorable structures as a result of grains of a kind (figure.3b).

In the case of the third and fourth (figure.3c, d) we have the structure to favorable and sustainable to grains the sand. Based on the data presented above we can show the area of use of mineral raw materials and finding the optimal solution of sand quartz for industrial products. Under regulation Gundlach chart (figure 4.1) indicated the possibility to determine the area of sands for use of block and brick manufacturing silicate [2].
In figure 4.1 is shown in graphic form a curve granulometry (grain composition) of an optimal mix of quartz sand. If the curve earned from evidence found in the area granulometry optimal, will they said, we have enough of granules composed of fine sand fractions, medium and thick, and then thanks to all the parameters we are dealing with a favorable distribution. With this achieved satisfactory properties: hardness the pressure large, high density, great durability against frost etc. Uniformity of the granules of sand is of great importance, especially in the case of mixture of different sands caution that deviations from the desired distribution of the granules of sand to be much lower [2].

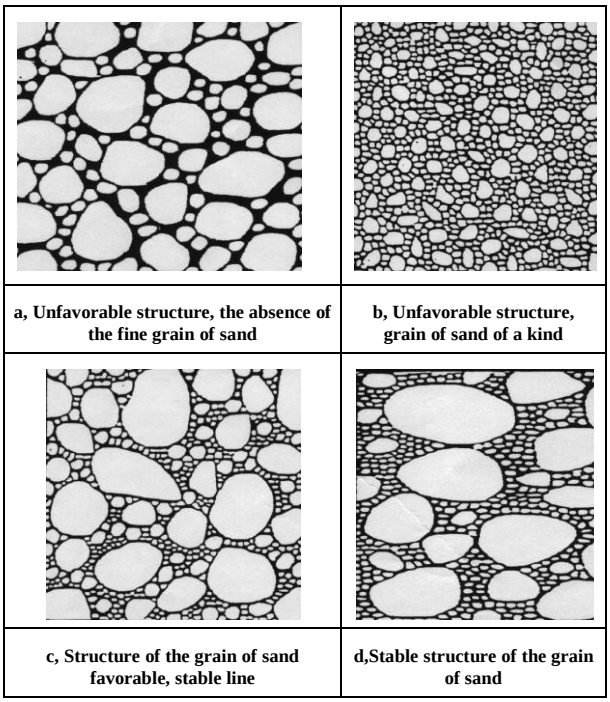

Figure.3: Submission of Grain of Various Sands for the Production of Silicate Bricks and Blocks

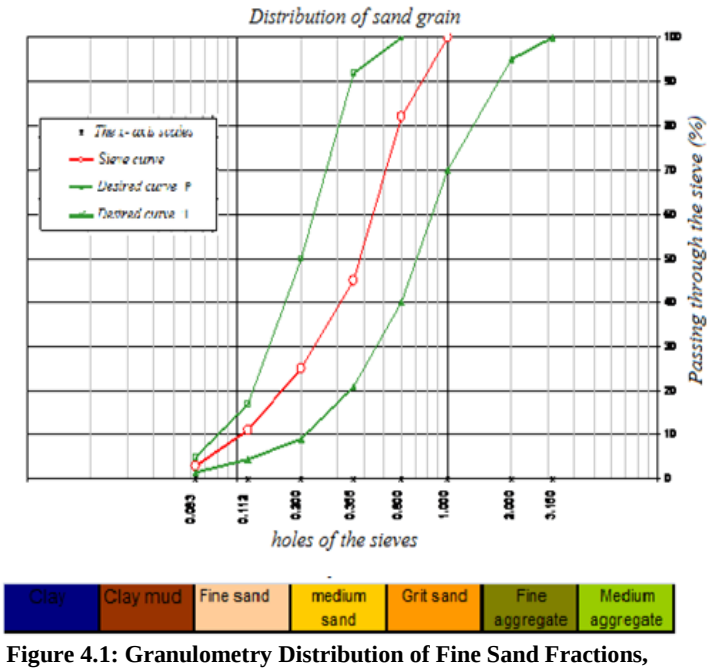

Figure 4.1: Granulometry Distribution of Fine Sand Fractions, Medium and Coarse

If the curve obtained from tests optimum granulometry located outside the area as shown in figure.4.2, this means that, we are dealing with enough of granules composed of sand and fine fractions of medium. Here we absence the granules of sand with thick fractions. If you add grain thick sand fractions can then be achieved desired results.

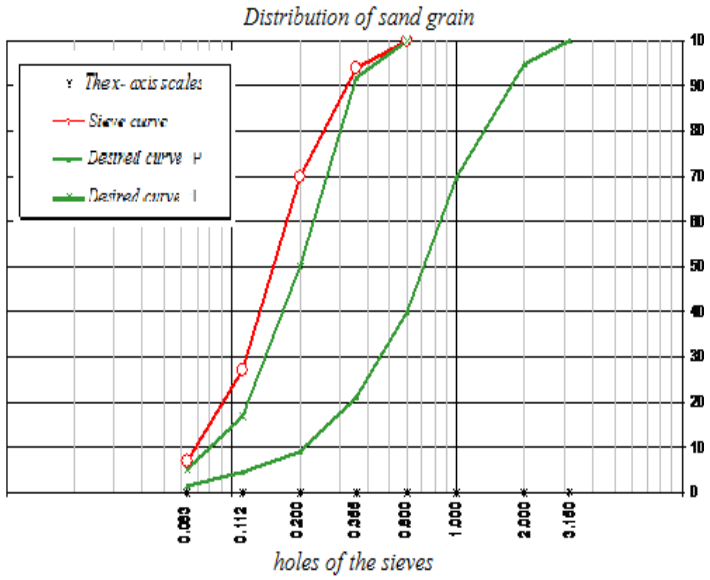

Figure 4.2 Granulometry Distrubution of Sand with Finely Fractions and Middle

If the curve obtained from tests optimum granulometry located outside the area, figure.4.3 this means that, we have enough content of the granules of sand fractions of medium and thick. Here there is absence of the fine granules of sand. If you add grains of fine sand fractions can then be achieved desired results.

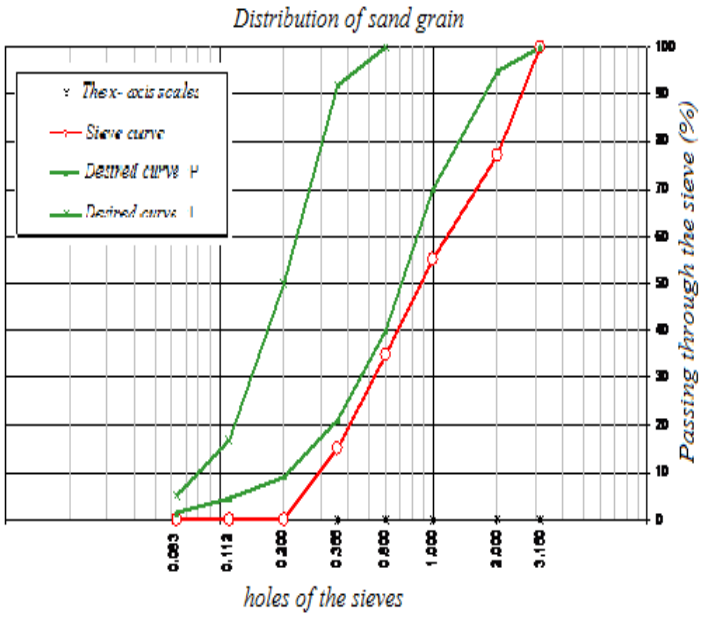

Figure 4.3: Granulometry Distrubution of Sand with Fractions of Medium and Thick

If the curve is obtained by partially granulometry evidence on the desired area, figure.4.4 this means that, we have enough content only the granules of sand fractions. Here we absence the granules of fine sand and coarse sand. If you add grains of sand and fine fractions can be accessed thick then the desired results.

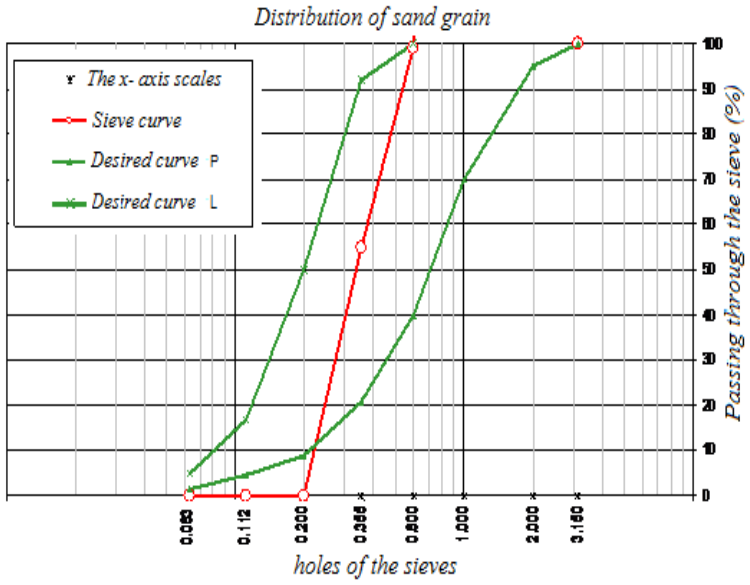

Figure 4.4: Granulometry Distrubution of Medium Sand with Fractions

If the curve is obtained by partially granulometry evidence in the optimum, figure.4.5 this means that, we have enough of granules composed of fine sand fraction and thicker. Here we absence the granules of sand sized fractions. If you add sand grain sized fractions can then achieve the desired results.

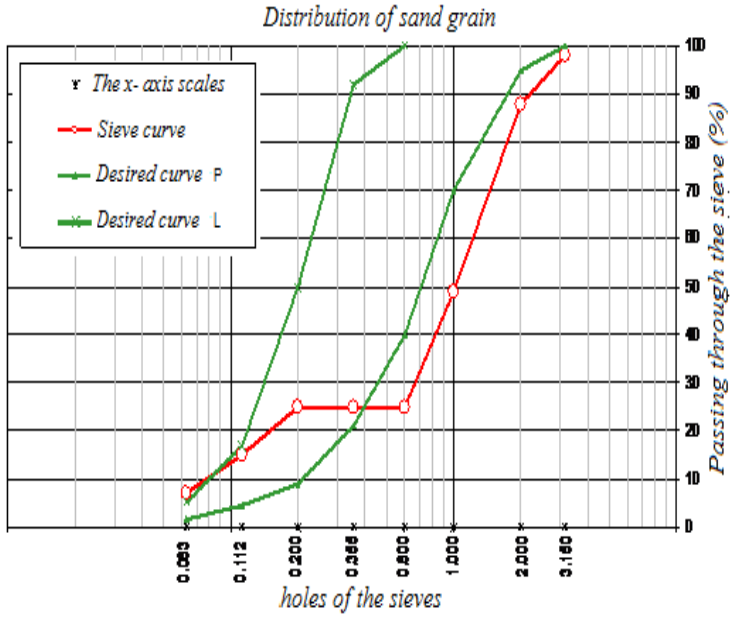

Figure 4.5: Granulometry Distrubution of Fine Sand and Thick Fractions

5. CONSLUSION

The practice work is accomplished in the factory for bricks and blocks production with the silicate base in “Xella” factory in Lipjan-Kosova. In the beginning are analyzed and studied, the raw material for brick silicate production, the production process with the relevant units for production and control of the quality of silicate bricks in this factory. Further on is proceeded in optimizing of technology parameters in production process for silicate blocks and bricks in “Xella” factory in Lipjan, which tells that this was the main goal of my paper work. The analytics work is concentrated in the granulating analysis components in sand quartz as a row material. The sand as a row material for brick production contents in major the fine granulated. According to the results of optimization are well defined structures with sand granules suitable for the production of silicate bricks and blocks.

REFERENCES

[1] F. Kadiu , Technology of buliding materials , Tiranë, 2004.,

[2] Kelmendi. M , Optimization of technological parameters during the production process in the plant silicate blocks “Xella” in Lipijane (Master Tethis-FXM), Mitrovice, 2007.,

[3] Hyseni.S , Deposits of construction materials FGjT-Mitrovice, 2010.,

[4] Group authors, Geological elaborate onassessing the quality of quartz sand deposit Mirosale , Viti, Freizaj, 2006.,

[5] Group authors, The main geological and general project , Prishtine, 2003.

ISSN: 2049-3444 © 2012 – IJET Publications UK. All rights reserved.