МЕДИЦИНА, ПЕДАГОГИКА И ТЕХНОЛОГИЯ: ТЕОРИЯ И ПРАКТИКА
Researchbib Impact factor: 11.79/2023
SJIF 2024 = 5.444
Том 2, Выпуск 3, 31 Март

КЛАССИФИКАЦИЯ ОБОРУДОВАНИЯ ДЛЯ ДРОБЛЕНИЯ ТВЕРДЫХ ЧАСТИЦ

Хайдарова Мунира Давроновна
Термезский инженерно-технологический институт
Республика Узбекистан, г. Термез.
E-mail: sirojiddinzoirov5@gmail.com

Уринов Эркин Юлдаш угли
Термезский инженерно-технологический институт
Республика Узбекистан, г. Термез.

Зоиров Сироджиддин Сахомиддин Угли
Термезский инженерно-технологический институт
Республика Узбекистан, г. Термез.

CLASSIFICATION OF SOLID PARTICLE CRUSHING EQUIPMENT

Khaidarova Munira Davronovna
Termez Engineering and Technology Institute
Republic of Uzbekistan, Termez.

Urinov Erkin Yuldash ugli
Termez Engineering and Technology Institute
Republic of Uzbekistan, Termez.

Zoirov Sirojiddin Sakhomiddin ugli
Termez Engineering and Technology Institute
Republic of Uzbekistan, Termez

АННОТАЦИЯ

Наше сырье, поступающее на производство, в основном твердое и имеет большие размеры. Это доставляет нам массу неудобств на производстве, а вместе с тем и приводит к снижению качества нашей продукции. Поэтому после прибытия нашего сырья его сначала промывают,

измельчают и подобные операции проводят и промывают на этапах производства. Эти этапы позволяют повысить качество продукта.

Abstract

Our raw materials that reach production are mostly hard and large in size. This causes us a lot of inconvenience in production, and at the same time, it also causes the quality of our products to decrease. Therefore, after the arrival of our raw materials, they are first washed, crushed and similar operations are carried out and washed to the production stages. These stages make it possible to increase the quality of the product.

Ключевые слова: Раздавливание, удар, молния, разлом, трение, стирка, изделие, прочность, хрупкость

Key words: Crushing, beat, lightning, break, rubbing, wash, product, strength, brittleness

Introduction

Grinding or grinding is the process of reducing the size of a natural or existing hard-brittle body (material) to the required size. In some cases, this process involves the preparation of the initial raw material, after which the material is sent for processing, for example, to produce cement. In other cases, for example, crushed stone (pebble) used in road construction and concrete mix is used directly. Crushed pieces are divided into coarse (100...350 mm), medium (40...100 mm) and small (5...40 mm) types depending on their average diameter.

If we define the degree of grinding *i*, the average diameter of uncrushed material D and the average diameter of crushed material *d* average diameter average diameter can be determined:

$$i = \frac{D}{d}$$

Rocks are the main raw material for building materials. In order to process these rocks, it is necessary to study their basic physicomechanical composition (brittleness, hardness, strength, size and formation).

Strength is the resistance of the material to its internal tension under the influence of external forces. This indicator is called the stability limit and is denoted by the letter s. This indicator is as important as when compressing the material and when stretching it. It can be determined using the following formula:

$$\sigma_{sq} = \sigma_{ch} = \frac{F}{S}, \text{ kPa}$$

where F is the crushing force, kN; S is the cross-sectional area of the material affected by the crushing force, m2. The compressive strength limit (MPa) of rocks can be as follows; 250 MPa and above are extremely strong, 150...250 MPa are strong, 80...150 MPa are moderately strong, and those up to 80 MPa are soft.

Brittleness is the failure of an object under the influence of plastic deformation at an imperceptible level. This indicator is determined by the failure of a load with a mass of 2 kg from a height of 1 m. If the material breaks in 2 blows - it is extremely brittle, if it breaks in 2...5 blows - it is brittle, if it breaks in 5...10 blows - it is sticky, if it breaks in 10 or more blows - it is extremely sticky. Crushed stone ((pebble), natural gravel and sand materials are mostly used in construction.

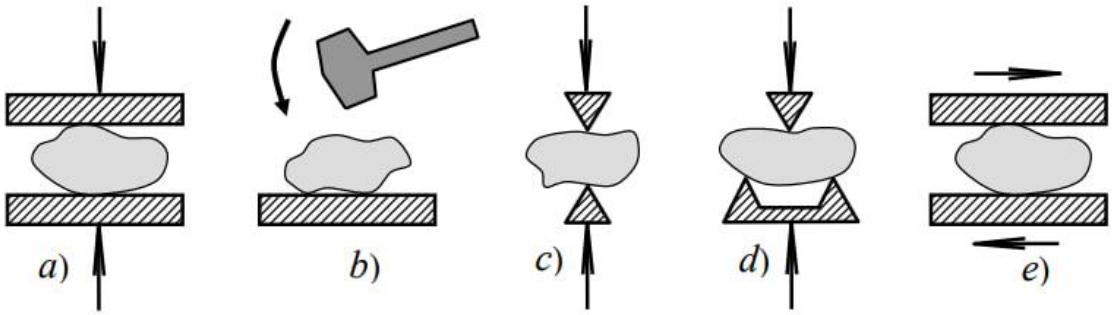

***Figure 1 A diagram of stone crushing methods*:** a-crushing; b-beat; c-lightning; d-break; e-rubbing.

Stone crushing machines and equipment can be divided into the following methods according to their function and operation process; slicing (picture a), percussive (picture b), lightning (picture c), breaking (picture d), Rubbing (picture e).

In most cases, the grinding process is a mixed method, for example, grinding with grinding, grinding with hammering, and grinding. Based on the composition, shape, size of the material to be crushed and various requirements for the finished product, crushing methods and related machines are selected. Stone crushers can be divided into the following groups according to their construction and operation process: Jaw stone crushers are used for coarse and medium crushing of stones of high and medium hardness. According to the movement of their jaws, there are simple and complex processing types.

Juval (cone) stone crushers are used for grinding stones of extreme hardness into coarse, medium and fine, high-grade forms. They have vertical cone designs for coarse and medium grinding and horizontal cone designs for medium and fine grinding. Roller stone crushers are used for medium and fine grinding of medium-hard stones and brittle materials. The reel is made of metal in the form of a cylinder, and its surface can be smooth or serrated. Percussive stone crushers are used for crushing medium-hard and small materials. According to their construction, there are hammer and rotor types. Mills are used to grind materials into powder form. There are periodic and continuous types of them. Although the material crushing machines are different, they must meet the following general requirements: simple construction, convenient and safe maintenance, the presence of mechanisms to protect against various hazards, sound, vibration and dust in the air. to be in sanitary and hygienic standards such as level.

Among the crushing machines, jaw crushers are used more often. The reason for this is the simplicity of their construction and simplicity of service. Depending on the size of the material, these machines can grind it into large, medium and small sizes. The process of using a jaw stone crusher is as follows; Material to be crushed is fed to a pan-shaped container consisting of movable 3 and fixed 1 jaws. The shape of the container depends on the size of the pieces of material in it. The material between the fixed and movable jaw is crushed due to compression by the movement of the movable jaw. When the jaw moves back, pieces of crushed material fall down from the container due to their own weight. In this way, the grinding process continues.

Depending on the kinematic characteristics, jaw crushers are divided into types with a simple moving jaw (Fig. a) and complex moving jaw (Fig. b).

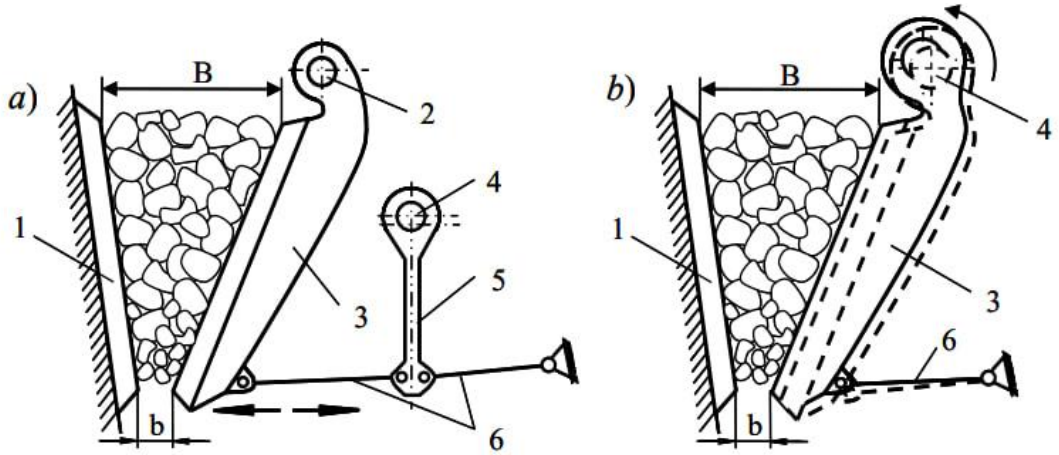

Figure 2. Kinematic diagram of a jaw crusher: a-jaw moves normally;

b-jaw with complex movements; 1 fixed jaw; 2nd movable jaw axis; 3-movable jaw; 4-eccentric shaft; 5th connecting rod; 6th pusher;

The size of the intake opening of the jaw crusher (B×L, mm) is the main parameter of the jaw crusher. The main parameters of jaw crusher machines used in industry are determined by the following dimensions: 160×250, 250×400, 250×900, 400×900, 600×900, 900×1200, 1200×1500, 1500×2 mm. The first five types of mills have a moving jaw with a complex movement, the last three have a simple movement.

Conclusion

The content of my conclusion is that I have learned about the types of grinders on this topic. I also studied the sequence of how their productivity is calculated.

References

1. East, G.S. Effect of applied stress on the alkaline hydrolysis of geotextile poly (ethylene terephthalate). Part 1: room temperature / G.S. East, M. Rahman // Polymer, — 1999. — № 40. — Pages 2281-2288.

2. Пилунов, Г.А. Переработка отходов полиэтилентерефталата / Г.А. Пилунов // Химическая промышленность, — 2001. —№6. — С. 22-28.

3. Рудакова Т.Е. Кинетика и механизм гидролиза полиэтилентерефталата в водных растворах гидроокиси калия / Т.П. Рудокова, Ю.В. Моисеев, А.Е Чалых, Г.Е. Заиков // Высокомолекулярные соединения, — 1972. — Том (А) XIV, №2. — С. 449-453.

4. **Nomozov A, K. Salsola Oppositifolia acid extract as a green corrosion inhibitor for carbon steel. Indian Journal of Chemical Technology. 2023, 30, 872-877.** https://doi.org/10.56042/ijct.v30i6.6553.

5. M.A. Shaymardanova, Kh.Ch. Mirzakulov, G. Melikulova, S.Z. Khodjamkulov, A.K. Nomozov, Kh.S. Shaymardanova Study of processe of obtaining monopotassium phosphate based on monosodium phosphate and potassium chloride. Chemical Problems. 2023 no. 3 (21). DOI: 10.32737/2221-8688-2023-3-279-293.

6. Nurilloev Zafar, Beknazarov Khasan, Nomozov Abror. Production of

Corrosion Inhibitors Based on Crotonaldehyde and their Inhibitory Properties. International Journal of Engineering Trends and Technology. Volume 70 Issue 8, 423-434, August 2022. ISSN: 2231–5381/ https://doi.org/10.14445/22315381/IJETT-V70I8P243.

7. Nomozov A., Beknazarov Kh., Khodzhamkulov S., Yuldasheva S. A. The studying of application of salsola oppositifolia extract in 0.5 M l of sulfuric acid as a green inhibitor for corrosion of carbon steel. ISJ Theoretical & Applied Science. -2022. -№. 04 (108). -P. 70-77

8. Ismatov A.A., Otaqo'ziyev T.A., Ismoilov N. P, Mirzayev F.M. N o o rg a n ik m od dalar texnologiyasi. - T., «O 'zbekiston », 2002.

9. Сулименко Л. И, Тихомирова И.Н. О с н о в ы т е х н о л о г и и тугоплавких нем еталлических силикатны х м атериалов. - М., РХТУ им. М ен д ел еев а Д. И., 2000.

10. Бобкова Н.М., Дятлова Е.М., Куницкая Т.С. О бщ ая технология силикатов. М и н ск , «В ы сш ая ш кола», 1987.

11. О бщ ая технол оги я си лик атов /П о д общ. ред. П ащ ен к о А. К и ев, «Вы сш ая ш кола», 1983.

12. Бутт Ю.М., Дудеров Т.Н., Матвеев М.А. О бщ ая т ехнол оги я силикатов. — М, «С тройиздат», 1976.

13. Мельниченко Л.Г., Сахаров Б.П., Сидоров Н.А. Т ехн ол оги я си лик атов /П о д ред. М атвеева М. А. М, «В ы сш ая ш кола», 1969.

14. Артамонова М.В., Рабухин А.И., Савельев В.Г. П рактикум по об щ ей техн ол оги и силикатов. — М, «С тройиздат», 1996.

15. Клюковский Г.И., МануйловЛ.А. Л абораторны й практикум по об щ ей техн ол оги и силикатов. — М, «С тройиздат», 1975