

## Potential of the Kyrgyz Republic for the production and export of bottled water

Kyrgyzstan is a country of majestic Tien Shan and Pamir-Alai mountain ranges, occupying 90 percent of the territory of this most beautiful pristine corner with rugged relief, located in the heart of Central Asia. The amazing views of this region, where there are 29 mountain peaks over 4,000 meters high and 45 peaks over 3,000 meters high, have earned this land the fame of the “Country of Heavenly Mountains”.

In the Kyrgyz part of the Tien Shan mountains there are more than 2,000 high mountain lakes. Since ancient times, many legends about the origin of these picturesque natural mirrors have come down to us.

More than 8000 glaciers and eternal snows stretching over 8100 sq. kilometers, make up about 30% of the total area of Kyrgyzstan. Glaciers make up 4% of the country's territory.

Nature has generously endowed Kyrgyzstan with huge fresh water resources contained in vast glaciers, full-flowing rivers, large and small lakes and large groundwater reserves. The mountainous relief allows the formation and accumulation of fresh water reserves.



The total amount of available water reserves in Kyrgyzstan is estimated at 2458 km<sup>3</sup>, including 650 km<sup>3</sup> of water (26.4%) stored in glaciers, 1745 km<sup>3</sup> in lakes (71%), as well as 13 km<sup>3</sup> of potential underground fresh and mineral-thermal water reserves.

Only in glaciers contains about 6.5 trillion. liters of fresh water. This is approximately 20 times the global bottled water consumption per year.

Given the significant water resources of Kyrgyzstan, as well as the growing demand in the world for bottled water, this industry seems to be very promising and deserves special attention for development and investment.

The source of natural glacial water is located in an ecologically clean, protected foothill zone of the Ala-Kush tract, the Ala-Archa National Park at an altitude of 2100 meters above sea level, which guarantees crystal purity and pristine taste and is considered unique. During the year, its chemical composition practically does not change. The water is lively, soft, saturated with minerals and practically devoid of natural salts.

Water is an excellent source of life activity. The low composition of mineralization makes the water ideal for daily consumption. Quenching your thirst with this water, you can not be afraid of the accumulation and deposition of mineral salts in the body. Water of melting ice, carrying the information of eternal spring and prosperity.

The flow rate of the natural water source (water content) is 4,320 cubic meters per day or 4,320,000 liters / day.

Even if 70% of this volume is used, 756 million liters of bottled water can be produced per year for the amount of 18.9 billion soms or \$225 million.

In 2021, the total export of bottled water from Kyrgyzstan amounted to \$226,000.

The potential of only one source of natural glacial water is 1000 times greater than the total export of bottled water.

### **The equipment for the plant can be divided into three components:**

- 1) equipment for purification and disinfection of water;
- 2) a line for bottling water into PET bottles;
- 3) equipment for the production laboratory.

### **Water purification and disinfection equipment**

The water treatment process can be divided into three parts: pre-treatment, advanced treatment and final treatment.

The pre-treatment system consists of multi-layer filters with quartz sand and activated carbon, softeners and filters to remove iron and manganese.

Advanced processing includes reverse osmosis membrane treatment.

The final treatment includes disinfection with ultraviolet and ozone.

#### **Quartz sand filter**

Removes organic matter, microorganisms, chlorine and some heavy metal ions.

#### **Activated carbon filter**

Used to filter chlorine in water <0.1 PPM and has a significant effect on odor, organic matter, colloid and iron in water.

#### **Sodium ion exchanger/water softener**

Used to remove calcium and magnesium ions from water, thereby softening the water.



*Pic.1 Water filter system*



Pic.2 Reverse Osmosis Cleaning Equipment

Reverse osmosis technology is the most modern method that uses the principle of water molecules passing through a semi-permeable membrane under the influence of external pressure. With the help of the reverse osmosis process, it is possible to get rid of 98% of impurities dissolved in water (in industrial installations, the figure can reach 100%).

Filters with reverse osmosis technology are used to obtain drinking water from polluted or saline sources, as well as to solve industrial problems.

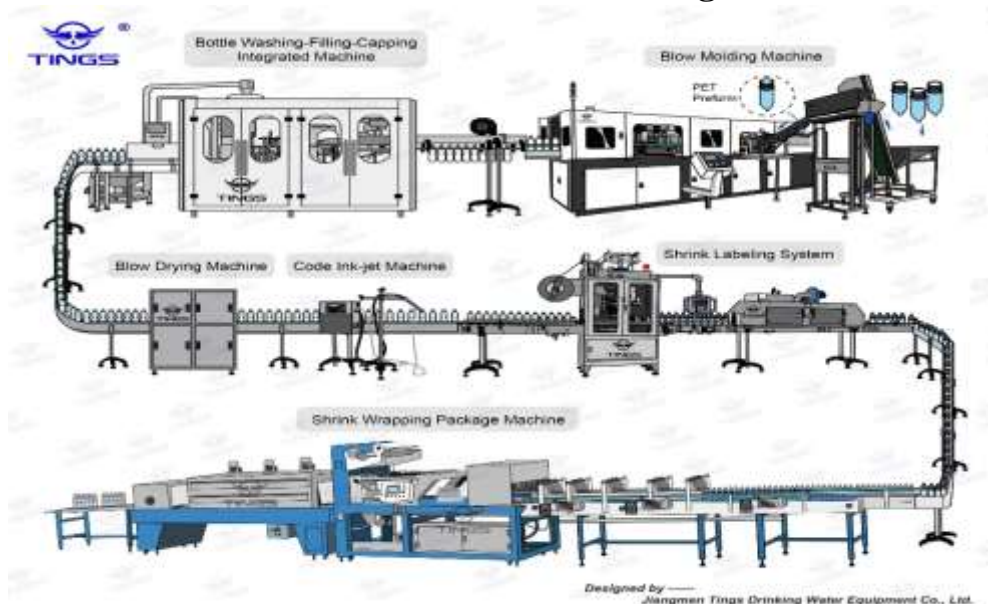
Most UV water disinfection plants use low mercury pressure lamps. When operating at this wavelength, water softens.

Pathogenic microorganisms can harm the human body only if they multiply in the body; when water is disinfected with ultraviolet light, this ability is lost and, as a result, any negative effect of microorganisms is excluded.



Pic.3 UV sterilizer

### Water bottling line



Pic.4 Water bottling line

The water bottling line includes the following equipment:

1. PET bottle making machine;



*Pic.5*

2. 3 in 1 water filling machine: rinsing, filling, capping;



*Pic.6*



*Pic.7*

3. Labeling machine;



*Pic.8*

#### 4. Packing machine



*Pic.9*