

Beijing Ultrasonic

Ultrasonic Transducer,Cleaner,Generator & Piezoelectric Ceramic

We are China Piezo Products Manufacturer who are specialists in [Ultrasonic Cleaning transducer](#),[Piezoelectric Ceramic](#),Ultrasonic Cleaner and [Ultrasonic Generator](#).

Ultrasonic Transducer Technical

1. Classification

In general,there are five types of [Ultrasonic Transducer](#).

- [Ultrasonic Cleaning Transducer](#)
- **Ultrasonic Welding Transducer**
- **Ultrasonic Beauty Transducer**
- **Ultrasonic Atomizer Transducer**
- **Ultrasonic Cell Disruptor Transducer**



Ultrasonic Cleaning Transducer



Ultrasonic Welding Transducer



Ultrasonic Beauty Transducer



Ultrasonic Atomizer Transducer



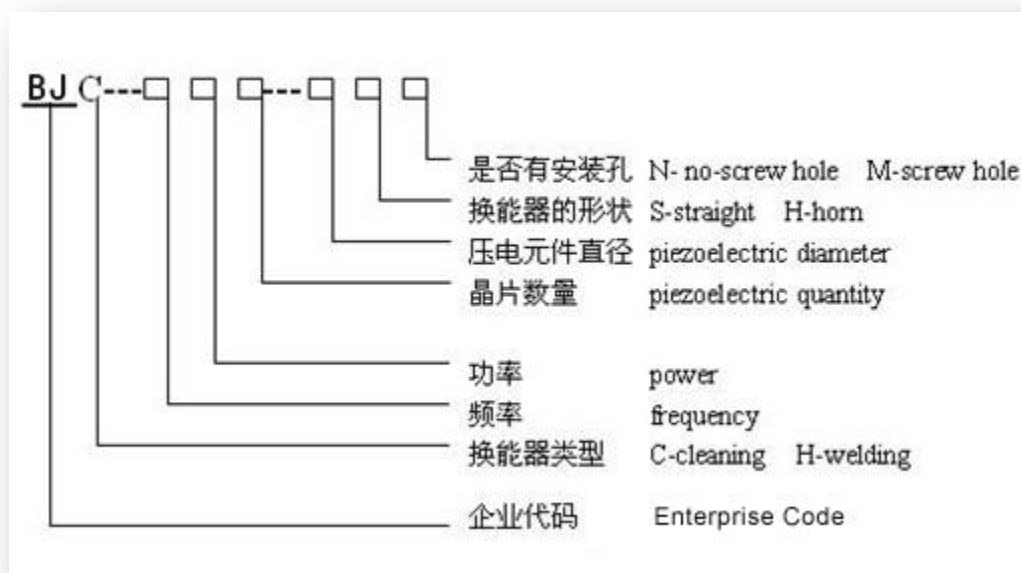
Ultrasonic Cell Disruptor Transducer

Other ways of classification:

- **Piezoelectric Ceramic:** PZT4 series(black chips) & PZT8 series(yellow chips)
- **Frequency:** Low-Frequency series(17~23 KHz), Medium-Frequency series(25~28 KHz), High-Frequency Series(33~60 KHz) and High-frequency series (68-200 KHz);
- **Power:** 50W Series(including 60W),100W series (including 80W), and other unconventional power;
- **Shape:** straight and horn shape

2. Naming Methods

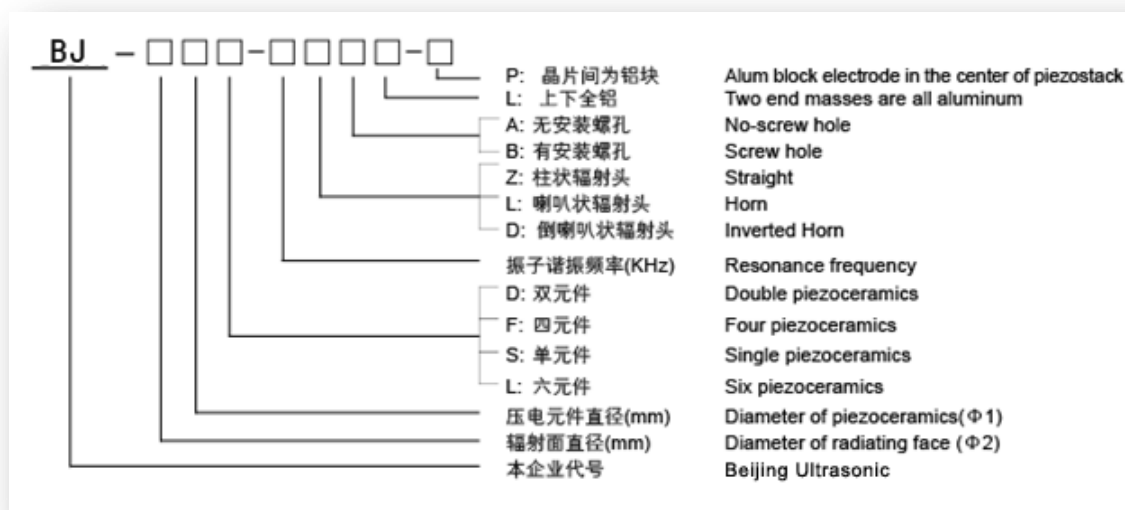
General Naming Methods



For example: BJ-18 50D-35HN PZT8

- BJ—"Our Enterprise Code"
- C—"Cleaning Transducer"
- 18—"18KHZ"
- 50—"50W"
- D—"Two Piezoelectric Ceramic"
- 35—"Diameter of Piezoelectric Ceramic"
- H—"Shape of Transducer"
- N—"Without Hole for the Transducer"

Note: Ultrasonic Cleaning Transducer Naming Methods



3. How it Works ?

The purpose of most [Ultrasonic Transducers](#) is to convert electrical energy to acoustic energy, do something useful with the acoustic energy, and convert the acoustic energy back into electrical energy. The conversion of electrical energy to acoustic (and vice versa) is a function of the piezoelectric element. Manipulating the acoustic energy and interfacing with the rest of the world is a function of the rest of the transducer.

Applying an alternating electrical field to a piezoelectric element causes it to expand and contract. This creates pressure waves, also known as sound, emanating outward from the element into the surrounding medium. Typically we want the sound to go in a specific direction, so the surrounding transducer parts are engineered to efficiently pass sound in that direction and absorb or reflect the sound in all other directions.

To keep the sound from going out the back of a transducer a “backing” layer is usually used. This consists of a material which will allow the sound in, absorb most of it, and allow very little back out. It is usually made of a soft material loaded with very heavy particles (like Tungsten) which can vibrate freely and dissipate the sound energy. Other materials are sometimes added to scatter the sound waves and sometimes the backing is carefully shaped to create multiple reflections within the backing to allow more opportunity to absorb the sound.

To efficiently propagate the sound out into the world a “matching” layer is used. This is an intermediate layer (or layers) between the ceramic element and the medium into which the sound is propagating. It is often a quarter wavelength thick and made of a material which has an acoustic impedance midway between that of the Piezo and the medium. It acts much like an anti-reflection coating on glass, allowing the sound to pass freely in both directions.

4. Bonding Process of Ultrasonic Transducer

Select the glue of low curing shrinkage and low coefficient of thermal expansion, which can reduce the gluing stress and improve the gluing reliability of the oscillator. we usually use the epoxy glue(a+b)

The adhesive surface adopts sandblasting process, so as to increase the adhesive strength.

The adhesive surface should be cleaned with acetone, absolute alcohol and other cleaning solvent to clean the cemented surface.

The vertical correction of the planting nail is very important when adopting the nail bonding process.

The size of loaded pre-stress and the control of its consistency are very important during adhesive curing processing.

Establish impedance control technology during gluing process to reduce the gluing impedance of oscillator and improve the electro-acoustic conversion efficiency.

Set up impedance testing technics after gluing cured to improve the uniformity of the load energy.

The option of electrode wire of proper softness and adopting reliable welding as well as taking measures to strengthen the insulation is very important.

The insulation test after wiring installation of after oscillator is very important.

Debug the machine in hot-water state (40 °C~60 °C), and control operation temperature of the machine. It is recommended less than 80 °C.

5. Frequency Selection

Cleaning objects are more heavier or more difficult to be remove out, and don't consider that the injury is superficial cleaning object, We should select low frequency transducer. Application industry: magnetic sector, vehicle maintenance industry, textile industry and so on.

Cleaning objects are a bit heavier dirt , and consider that the injury is superficial cleaning object.We should select middle frequency transducer. Application industry: most mechanical processing industry, electroplating industry, food industries and so son.

Cleaning objects are to clean, we should select high frequency transducer. Commonly used in industry areas precision parts, glass, glasses, electronic components, circuit boards, etc.