

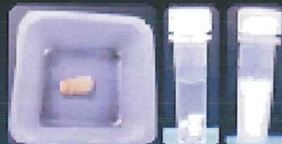
[ビーズ破砕機]

ビーズクラッシャー μ T-01 Actual crushed samples

Animal cells/Organs

Plant cells/Tissues

Figures of sample Before After



Skeletal muscles (chicken)

Sample volume: 100mg
Crushing Time: 30 sec

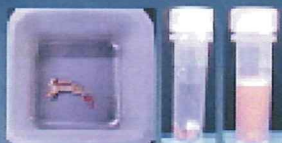
Bead: ϕ 5mm SUS x 1



Cervical spine (chicken)

Sample volume: 100mg
Crushing Time: 60 sec

Bead: ϕ 5mm SUS x 5



Bone (chicken)

Sample volume: 100mg
Crushing Time: 30 sec

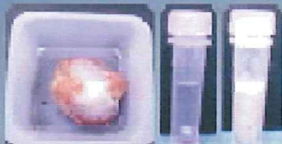
Bead: ϕ 5mm SUS x 1



Lung (chicken)

Sample volume: 100mg
Crushing Time: 5 sec

Bead: ϕ 5mm SUS x 1



Gizzard (chicken)

Sample volume: 50mg
Crushing Time: 30 sec

Bead: ϕ 5mm SUS x 1



Gastrocnemius muscles (rat)

Sample volume: 100mg
Crushing Time: 30 sec

Bead: ϕ 5mm SUS x 3



Aortic (rat)

Sample volume: 100mg
Crushing Time: 60 sec

Bead: ϕ 5mm SUS x 3



Minerals

Limestone

Data provided: Prof.Masahiro Ito/Tokyo University
Crushing Time: 30 sec
2ml of custom container + metals crusher (one piece)

Available crushing sample and types of applicable beads and numbers



Grifola frondosa

Sample volume: 100mg
Crushing Time: 15 sec

Bead: ϕ 5mm SUS x 1

Broccoli

Sample volume: 100mg
Crushing Time: 60 sec

Bead: ϕ 3mm SUS x 10

Green pepper

Sample volume: 100mg
Crushing Time: 60 sec

Bead: ϕ 5mm SUS x 5

Leaf (kind of camellia)

Sample volume: 100mg
Crushing Time: 60 sec

Bead: ϕ 5mm SUS x 3

Figures of sample Before After



Peanut

Sample volume: 200mg
Crushing Time: 60sec

Bead: ϕ 5mm SUS x 3

Raw rice

Sample volume:
5 grains
Crushing Time : 60 sec

Bead: ϕ 5mm SUS x 3

Microorganism

E.coli

Picture left: Before crushing
Picture middle: ϕ 0.3mm glass beads / 4 min
Picture right: ϕ 0.5mm zirconia beads / 3 min



Yeast

Picture left: Before crushing
Picture middle: ϕ 0.5mm glass beads / 2 min
Picture right: ϕ 0.5mm zirconia beads / 1 min



The conditions of bead type crushing include many parameters, such as type, diameter, numbers, shaking speed, shaking time of beads, type and quantity of buffer, and type and quantity of sample. The items on which the special emphasis is placed vary depending on the application after crushing. Please use the information published below for optimization of the crush conditions. The crush power in bead type crush mainly depends on the mass of the added bead. If it has the same diameter, the bead having the material with larger gravity (Fig. 1) is expected to have high crush efficiency and if it has the same material, larger bead (Fig. 2) is expected to have high crush efficiency. However, selection of the bead according to the sample is needed. For example, when the diameter of the bead is extremely larger than that of the subject for crush, insufficient crush effects are acquired due to the gaps of the beads. The rough standard of selection of beads is shown in Fig. 3. For optimization of the crush conditions, it is necessary to pay attention to the matters other than crush efficiency. Particularly in the case of extraction purpose of proteins, because heating and foaming of solution due to the collision of the beads may cause proteinic denaturation, it is necessary to take care of the operation time, amount of solution in a tube, etc. (Fig. 4).

Fig. 1: Gravity figure of the main materials diameter used for the bead type crush

Materials	Specific gravity (g/cm ³)
Glass	2.5
Zirconia	A 60
Stainless steel (SUS304)	7.9

Fig.2 Weight ratio of the bead with different of the same material (B3/A3)

		A				
		5	4	3	2	1
B	5	1.00	1.95	4.63	15.63	125.00
	4	0.51	1.00	2.37	8.00	64.00
	3	0.22	0.42	1.00	3.38	27.00
	2	0.06	0.13	0.30	1.00	8.00
	1	0.01	0.02	0.04	0.13	1.00

For example, the weight of one bead with a diameter of 5 mm is equivalent to 1.95 beads of 4 mm, 4.63 beads of 3 mm, 15.63 beads of 2 mm, and 125 beads of 1 mm, respectively.

Micro tube which can be used in μ T-01

The general 2 mL screw type micro tube can be used. (For typical example, see following table) Both conical type (V bottom) and independence type (with a skirt) are supported.

When the small bead with a diameter of below ϕ 1 mm is used, a 1.5 mL tube can also be used.

Keep in mind that the tube with a loop and the "cryo tube (vial)" for freeze preservation of cells cannot be attached to the holder.

Supplier	Check	Product name	Model number	Remarks
Watson	○	2.0 ml screw cap tube, conical type	1392-200	
Assist	○	2.0ml freeze preservation tube (with GIZA) bottom shape: V bottom	72.693	
Iona optica	○	2.0 ml screw cap tube, conical type	2220	BIO-BIK

Fig. 3: Standard of bead selection

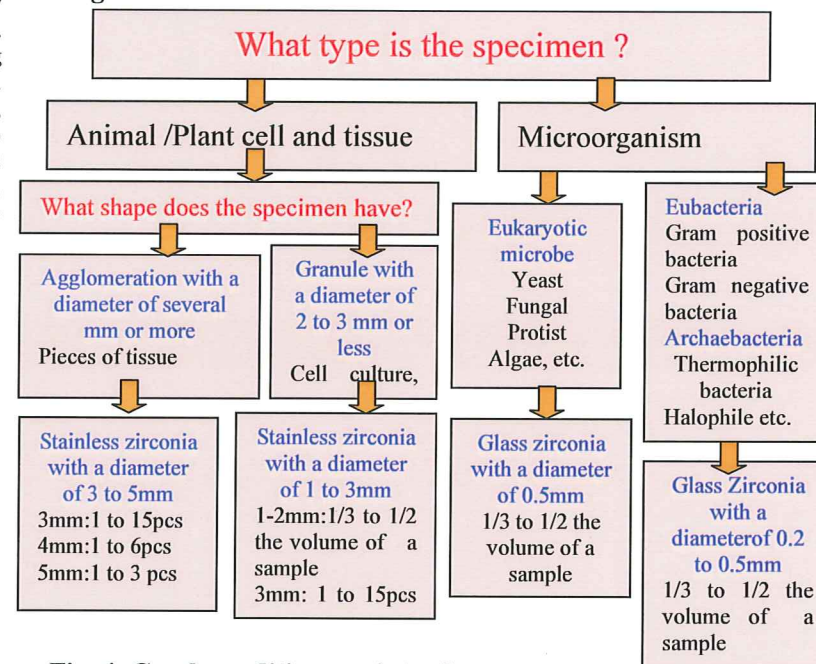


Fig. 4: Crush conditions, points of concern

