

Operating a *Tatara* Furnace

Tatara furnaces can be operated using two different methods: direct smelting and indirect smelting. The direct method creates a porous mass of iron and steel, called a *kerā*, which is formed at the bottom of the furnace. The indirect method creates lower-grade pig iron, which flows out through channels at the base of the furnace.

Direct smelting is employed at Nittōho Tatara, a local ironworks that revived the *tatara* method. Each operation is a continuous process that lasts three days and three nights. While a crew of workers maintains the supply of raw materials in the workshop, the *murage* (foreman) and his assistant add layers of iron sand and charcoal to the furnace every 30 minutes or so.

The exact amounts of iron sand and charcoal consumed in a single operation of the furnace differ each time. The *murage* must judge how much to add by listening to the sound of the furnace and observing the state of the *kerā* through small holes in the furnace near the air pipes. On average, Nittōho Tatara uses 10 metric tons of iron sand and 12 metric tons of charcoal to produce a *kerā* weighing 3 metric tons.