

ABSTRACT OF THE DISCLOSURE

Provided are a large-size diesel exhaust valve and a manufacturing method thereof, which relate to the technical field of manufacturing of large-size diesel exhaust valves for ships. The large-size diesel exhaust valve includes an exhaust valve disc portion made of a 3J40 alloy, and the large-size diesel exhaust valve has the following microstructure: there are ultra-fine grains with a grain size of 10 grade or more, α -Cr lamellar phases are evenly distributed at grain boundaries of the ultra-fine grains, nickel-lean Cr-Al-Ce particle phases are evenly distributed in a matrix, a single lamella of the α -Cr lamellar phases has a thickness of less than 140 nm, and the nickel-lean Cr-Al-Ce particle phases have a diameter of less than 10 μm . The manufacturing method includes: a pretreatment: subjecting a 3J40 alloy bar to a solution treatment at 1,000°C to 1,050°C for 50 min to 70 min to obtain a first intermediate material, and oil-cooling the first intermediate material to obtain a second intermediate material; subjecting the second intermediate material to electric upsetting, a reheating treatment, a heat preservation treatment, and die forging successively to obtain a first initial exhaust valve; and a post-treatment: subjecting the first initial exhaust valve to an aging treatment at 770°C to 790°C for 16 h to 18 h to obtain a second initial exhaust valve, and air-cooling the second initial exhaust valve. The present application solves the technical problem of how to improve the comprehensive mechanical properties and the vibration-damping performance of a large-size diesel exhaust valve simultaneously.

FIG.8