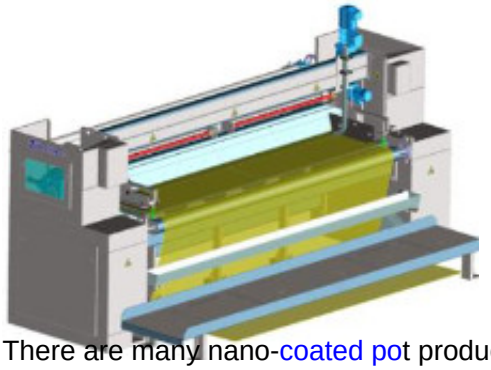
Profile analysis of nano coating for non stick pan



There are many nano-coated pot products on the market. There are many kinds of fabrication processes and coatings structure. There is no standard to regulate the composition of coatings. There are few domestic literatures to analyze the structure of coatings. At present, the implementation standards of non-stick pans are GB/T32095-2015 "Specification for Non-stick Surface Performance and Testing of Metal Cooking Appliances for Household Food" and QB/T4223-2011 "Oil-free Fried Pan". They only specify the appearance inspection, thickness measurement, non-stickiness and thermal shock of coatings. Methods, these methods can only get "qualified" or "unqualified" information, that is, they can not classify the qualified products, nor can they get the reasons for the unqualified products.

This is because the above methods are based on Indirect testing of the coating surface, and the internal structure information of the coating can not be obtained. For example, the standard stipulates that non-magnetic eddy current thickness gauge is used to test the coating thickness, and the total thickness is obtained. It is impossible to detect the defects of the coating and whether it is a composite coating. This is not conducive to inspectors and consumers to judge the quality and performance of the coating. The standards for testing non-stick pot products by microwave heating machinery and equipment are GB/T3095-2015 and QB/T4223-2011, the latter directly refers to the former for the performance requirements of non-stick coatings. The thickness of non-stick coatings is different between the two. The former stipulates that the thickness of non-stick coatings should not be less than 10 micron, and the latter stipulates that the thickness of non-stick coatings should not be less than 25 micron. The testing methods are all non-magnetic eddy current thickness gauges.

The degree of firmness test of the coating is carried out. The experimental process is as follows: the sample is immersed in boiling water and boiled for 15 minutes to remove (the sample starts to boil when the water boils after immersion), and then dried with a soft cloth after natural cooling. With a sharp blade and a steel ruler, 11 parallel scratches 1.5 mm apart and 38 mm in length were carved on the coating. The above steps (100 grids) were repeated perpendicular to the scratches. The tip of the tool must penetrate the coating to the metal. A one-sided transparent adhesive tape (3M-898) is used to adhere to the scratch area. The direction of the adhesive tape is parallel to a group of scratch lines. The nail is used to rub the tape to remove the air at the adhesive area of the tape and make it adhere to the coating to the maximum extent. Pull one end of the tape with your finger, and pull it up quickly at 90 degrees right angle for three consecutive times, each time using new tape. Rotate the scratch 90 degrees and repeat the above steps.

Because of the simplicity of the methods prescribed in the existing standards, although the above three pots all meet the technical requirements of the relevant standards, in fact, the structure and performance of different coatings are quite different, so it is difficult for the inspectors who inspect the pots according to the existing standards to determine the quality grade of the coatings. The metallographic method of profile can overcome the shortcomings of the existing standard and analyze the coating.