

Solution to adhesive problems such as plastic material, to achieve IP68 waterproof test

塑胶材质等粘合性问题解决方案，做到绝对防水测试 IP68

With the rapid development of TPE thermoplastic elastomer industry in recent years, the application of TPE rubber covered secondary injection molding is more and more mature and extensive. Many hard plastic products, through the introduction of TPE soft material, improve the soft touch, grip, aesthetics and other functional characteristics of products. The key point of TPE (secondary injection molding) is to make TPE and coated base materials (hard plastics, hereinafter referred to as PP, ABS, PC, PA, etc.) well coated and bonded. In order to make TPE and hard plastics well bonded, according to the principle of chemical similarity and compatibility, the key is that TPE and hard plastics should have similar polarity, so that TPE and hard plastics can fuse at the molecular chain level. Therefore, the type of hard plastic determines the formulation of TPE, and the secondary injection process (such as the temperature of secondary injection) directly affects the adhesion between TPE and hard plastic.

1. TPE formula

Different hard plastics, such as PP, PC, ABS, PA, etc., need different TPE formulations and models. Therefore, it is recommended to find a TPE manufacturer with strong strength to cooperate. TPE dealers or traders usually have little knowledge of TPE formula.

2. Coating of different hard plastics.

1. PP wrap

PP is a kind of plastic with weak polarity, which is very close to the TPE polarity of SEBS. Therefore, the most conventional TPE formula can be directly used for rubber coated PP without adding polar modifier. Although TPE of rubber coated PP is the most common type, the secondary injection temperature used is also very important. Enough injection temperature must be used to ensure the fluidity and rapid coating of TPE on the surface of PP. This injection temperature should ensure the rapid formation of a fusion layer on the surface of PP. It is beneficial to the adhesion of TPE and PP, but not to cause thermal deformation of PP plastic parts during injection molding. It is suggested that the temperature of secondary injection coating is 170 ~ 220 °C. Note: SBS is not recommended as TPE modified base material for PP coating.

2. ABS, PC coating

ABS and PC are weak to medium polarity plastics, which have a certain polarity difference with TPE. The polarity of TPE can be improved by adding modifier (TPU) in the formula, so as to improve the adhesion of TPE with ABS and PC. In addition, the temperature of secondary injection is suggested to be 180 ~ 230 °C. The specific can be adjusted according to the actual processing situation.

3. PBT, PET coating

PBT and PET semi crystalline plastics are similar to ABS and PC in polarity. The melting point of PBT is 220 °C, the melting point of PET is as high as 260 °C, and TPE is required to have higher melt temperature. Therefore, the secondary injection temperature of TPE coated PBT and PET is higher than that of ABS and PC. It is difficult to bond.

4. PA6, PA66 rubber coating

PA6 and PA66 are semi crystalline strong polar plastics, which need high temperature and energy to form a fusion layer on the hard plastic surface. The melting point of PA6 is 240 °C, and the melting point of PA66 is 260 °C. In order to form a firm adhesion, TPE needs a higher melt temperature. Generally, TPE needs a temperature of PA6, 230-250 °C for secondary injection molding, and 240-270 °C for TPE. In addition, PA6 and PA66 are easy to absorb water, which are unfavorable factors for coating and bonding.

5. POM wrap

POM coating. Although the melting point of POM is not high, it is only 180 °C. However, due to its high crystallinity, it needs high energy to form a fusion layer on the cladding. At the same time, due to the self lubrication of POM, it is not conducive to the rapid coating of TPE material on the surface of POM hard plastic parts. Therefore, POM coating, in China, I haven't heard of a TPE manufacturer that said the package is solid.

Finally, I will make a conclusion and supplement. The second injection of TPE and PP, ABS, PC, PA and other plastics depends on the formulation of TPE and the appropriate coating process. In addition, for PA6, PA66, PBT and other high melting point plastics, the hard plastic parts are preheated before the second injection, which is conducive to the adhesion of TPE and hard plastic. In the second injection, high injection temperature (to the extent that TPE does not degrade) and high injection rate are used, so that TPE has as much energy and time as possible to achieve cladding and fusion with PA6, PA66, PBT and other hard plastic parts, so as to form a good adhesion.