

Protact for Three-Piece Cans

By Tata Steel Europe | Category: Implemented Innovations

Conventional three-piece cans can't use a Protact coating as it is not possible to weld polymer. With this innovative technology, developed and designed in Tata Steel Packaging Duffel, the benefits of Protact have been opened for the three-piece body cans. By removing the Protact at the weld margin, material for a wide variety of can sizes can be produced. It creates a food safe, lacquer free, direct printable can. It can be used in existing lines without any investment. It simplifies the can making process as it eliminates all basic lacquering steps. This innovation literally brings the future of can making to the conventional three-piece market, and opens it to the potential of Protact.



The Context

Customers have been asking for a price-competitive Protact solution for three piece cans for over 15 years. The only polymer coated product on the European market is sheet glued. This is very costly and only works for very specific products. To find a solution for all products, multiple difficult issues need to be overcome. This involved finding solutions for shrinking of the film (all commercial film shrinks), prevention of surface defects as tin melts before the adhesion temperature needed and creating a stable slit before applying the film. General assumption was that this could not be done price competitive (only very expensive solutions). The actual performance of the line in Duffel was the trigger to start searching for a solution.



The Innovation

Protact for three-piece cans is unique in the combination of an ETP coil-fed continuous process, using direct extrusion film, precision film and strip steering, film slitting and removing, film application and fast cooling after post heating. The heart of this innovation lies in the technology that was developed to create multiple stable slits of film that are cut and removed without any movement of the original film. A new technology has been used to create a slit measurement. This enables operators to see that the slits are at the customer's requested position. It creates a unique double-sided laminated product, customized to customer needs, resulting in two to five can bodies to be cut from the width of the steel strip. The slits are between 4 and 7 mm wide, and every slit has an accuracy of +/- 0.5mm. It creates, after cutting, the exact sheet a customer needs for its can with a weld margin as specified by customer. This results in a product that has all Protact and ETP weld-ability benefits, with the additional benefit that the film will not shrink during the lamination process or during welding and curing (heating) of the weld margin protection agents at the customer's end, thus creating a welded can with a guaranteed corrosion performance in the welded area of the can body. The product can be used at customer on the same line as used for lacquered ETP, without any investments. It eliminates lacquering cycles for the can body in the customer's process.



Overcoming Challenges

Challenge #1

Making the actual slitting work, and getting it stable enough to be at any position +/- 0.5mm. The key item in this was constant trial and error testing. Duffel developed a testing program on doing one to two tests per week, constantly learning, adjusting, and improving the process. As Duffel is a production location, it is not built for testing. To achieve the goals, a standard testing process was developed to ensure maximum results. The contacts with supplier of the equipment were very frequent, so issues and potential solution could be developed between both parties.

Challenge #2

There is a long road between the initial sample, showing the ability to produce weld free Protact, and a commercial product running at customer. It needs to be proven that the coil can be cut into sheet, securing a stable bare edge for welding. It needs to be proven that the can, can be made with H grain welding instead of C grain welding. It needs to be proven that the can passes the normal testing after production, and that the can holds after pack-testing.

Impact of the Innovation

sales impact

a mature alternative for packaging material (especially food)