ROLL FORMING

Cold Rollforming of Sandwich Panel Sections

A S Shetty

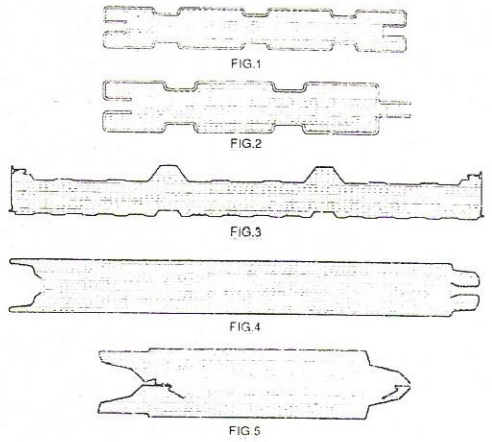
In this thirteenth series of articles on Rollforming we will discuss about rollforming of Sandwich Panel sections which is increasingly going to be the future trend. The origin of Sandwich panels can be traced to the age old wood-working industry(plywood). Honeycomb sandwich panels have been used extensively over the years for applications where their strength,stiffness/weight ratios are very high. They have been used for Aircraft flooring/ interiors, ship interiors, train interiors etc. They typically utilize low density foam or honeycomb core sandwiched between two facing materials to produce lightweight panels.What we are now going to discuss would be sandwich panels used mostly in the building construction industry.

In the case of Sandwich Panels the two metal faces positioned on either side of a core of a thermally insulating material which are firmly bonded together so that the three components act compositely when under load (wind loading, access loads etc.) For the metal faces rollformed pre-galvanised painted sections are predominantly used. Apart from this rollformed stainless steel, plastic coated steel, galvanized steel or anodized aluminium sections are used.Wherever required, the panels are joined to one another using tongue and groove principle. For simple shaped and shorter panels the sections could also be press- braked. But for intricate and longer sections they are rollformed.

Polyurethene Sandwich Panels use polyurethane hard foam which is the thermal insulating agent.Polyurethene injected sandwich panels offer a very economical solution for achieving reliable temperature control and providing coated, hygienic surfaces that can be washed down frequently..

Rigid polyurethane foam has one of the lowest tharmal conductivity ratings of any insulant, which allows efficient retention of heat or, alternatively, maintenance of a refrigerated or frozen environment. Effective insulation in all types of building plays a vital role in the conservation of non-renewable fossil fuels, which reduces emissions of carbon dioxide gas, reburning of fuels for energy and therefore reduces global warming.

The design of the panels is such that it can be filled with materials to extend and tailor the properties throughout the structure. Different filler materials can be used to provide heat insulation, sound attenuation or energy absorption properties. Following are the three major areas of usage of Sandwich panels.



1. External Claddings- These are used for single and occasionally multi-storey buildings, factory buildings , ware houses etc. In hot countries,especially in the Middle-East, for the Roofing sheets they invariably use insulated roof and wall panels to shield the inside of the building getting hot. In the cold countries the insulated panels stop the inside of the building getting cold. Polyurethene is the most common core insulation for this application. Sandwich panels used externally have to withstand windloads and also be weather tight.

2. Insulated internal envelopes and partitions.- These are used typically in food processing industries, cold storage rooms for floriculture and horticulture,sea-food, insulated and refrigerated containers for transforting perishables/food,diary products ,pharmaceutical industries, telecom shelters,noise insulation enclosures for DG rooms ,laboratories, hospitals etc.. Polyurethene and Expanded Polystyrene(EPS) are the common core insulation used for these applications.

3. Fire resisting compartment walls -. Apart from masonary , sandwich panel systems can be used very successfully in this application. High density Rock Wool (mineral wool) is commonly used as core insulation for this application which can easily provide panels with 90 minutes and upto 240 minutes fire resistance.

Fig. 1 to Fig 5 are some of the typical sandwich panel sections. Out of these, Fig. 4 and Fig.5 show the sections developed by Sedvik Industries, Bangalore which are used for making sandwich panels. Out of these Fig.5 are the Sections developed for an industry in Macedonia which are used for making insulated doors. In both the cases they inject polyuretnene between two metallic skin sections under high pressure. There are several different shapes which could be adopted for making sandwich panel sections catering to different areas of applications.

For any clarifications the readers can contact at 080-25452669 or email at sedvik@vsnl.com. For the last twelve issues of Industrial Business Mart for referring the article subscribe today @350/- for two years, email us at info@haritha.org