

# HOLE CLASSIFICATION PRODUCED FOR AIRCRAFT INDUSTRY IN CFRP/ METAL SANDWICHES

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In this article the results of manufacturing process analysis of hole production for aircraft industry in CFRP/metal sandwiches are presented. Hole production is provided with hand-guided tool. The review of the most widespread tool backup facilities according to manufacturing process analysis is stated. Hole classification for CFRP/metal sandwiches was suggested according to the specific production step. Five types of holes machined in CFRP/ metal sandwiches were classified. They are: one pass holes, multi pass holes without bolt head housing and intermediate dismantling, multi pass holes with bolt head housing and intermediate dismantling, multi pass holes without bolt head housing and without intermediate dismantling, multi pass holes with bolt head housing and without intermediate dismantling.

CFRP/metal sandwiches demand special processing methods linked with multi component structure and CFRP anisotropy. That is why it is necessary to support a sharpness of a cutting edge, prevent excessive heating and thermal damage of CFRP, eliminate build-up formation on cutting edge, use the vacuum sweeper for a chip control while drilling without lubricant-cooling agent applications, raise rigidity of the thin CFRP layers on an exit of a drill at the expense of a support plate under CFRP layer, provide chip removal from a zone of hole shaping by means of easily evaporated fluids, protect electrical parts of machines from a dust produced in process of CFRP drilling.

The solution of these problem, is seen in creation of the instrumental materials and-or axial instruments ensuring acceptable economic indexes of holes drilling both in CFRP, titanium and aluminum alloys. Automatic control system can be a solution in cutting speed and feed regulation in hand-guided tool. Recent researches show that combined instrument usage, each part of which is optimized for drilling CFRP and a titanium alloys can reduce machining time of hole production at the expense of work mix.

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