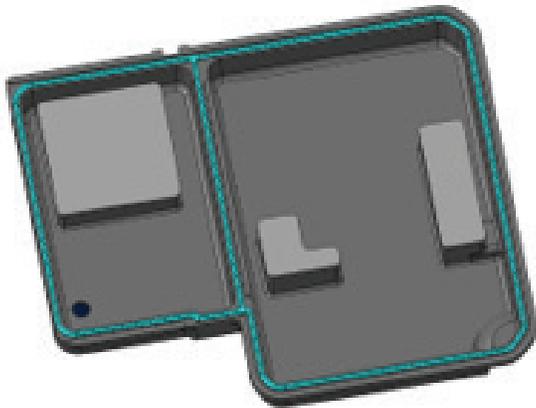


## MULTI-FUNCTIONAL SOLUTIONS

# Auto Radar Heat Sink

## Design Team Stops EMI-Spawned False Target Detection

### CASE STUDY



### BACKGROUND

Mid-range and short-range radar heat sinks perform thermal and EMI mitigation tasks. Yet as they rid components of unwanted heat, additional and troublesome issues can arise. An example is false object detection. A heat sink which lacks high-performance EMI materials can result in a radar system which produces periodic “false object” detection. This false targeting can be avoided through effective stray EMI protection between and inside heat sink cavities. A prominent ADAS and autonomous driving component manufacturer recently faced this issue, knowing it needed to achieve significant reductions in cavity-to-cavity coupling. Only then could it improve overall radar system performance and secure final system validation.

### CASEBOOK SITUATION

The manufacturer had sought a variety of remedies. Over time the company knew that a more robust EMI mitigation design solution was imperative for the radar’s die-cast heat sink. Design engineers also knew resolving EMI issues using a single solution - or multiple solutions - could only be accomplished if the choice also met strict requirements in terms of allowable tolerances, particle size, minimal strain on sensitive components and the need for large-scale production. One example involved the tight tolerances demanded for gasket height, including an automated, 100 percent no-flaw inspection system. A second pertained to heat sink cleanliness, where maximum particle size was set at 100um for metallic and non-metallic particles. The riddle was how to achieve final validation of the overall radar system and go to market as quickly as possible.

### RESOLUTION

Reviewing its options and carefully evaluating suppliers with an aligned track record, the manufacturer selected **Laird Performance Materials**. The global company employs advancements in the material sciences to simultaneously resolve EMI and heat issues affecting sensitive components using multi-functional solutions incorporating a single process design.

### IMPLEMENTATION

To correct heat sink issues, Laird stepped forward quickly and expertly. Laird has experts in innovative multi-functional solutions around the world. The manufacturer now receives Laird’s 100 percent automated inspection of gasket height tolerance along with 100 percent automated inspection of thermal pad dimensions and positioning. It also benefits from Laird’s automated thermal interface pick-and-place capabilities (**Laird TIM Pick**), volumetric form-in-place material dispensing, low shore hardness “soft” thermal pads (**Laird Tflex HD400**), form-in-place conductive silicone gaskets (**Laird SNC45-RXP**), and low shore hardness hybrid thermal/EMI material (**Laird Coolzorb HD500**). Large-scale Laird production facilities in Reynosa, Mexico, will solve the high-volume die cast heat sink manufacturing needs. The desire to achieve higher levels of part cleanliness levels is being met soon through Laird’s state-of-the-art manufacturing complex in Liberec, Czech Republic.

### RESULTS

The Laird relationship is strong and growing. A sizable cost reduction has been realized with the introduction of SNC45-RXP in particular projects. The radar heat sink, now validated, experiences little of its former cavity resonance issues. The manufacturer is now enjoying the benefits of a single combined solution.

It is effectively reducing cavity resonances in the heat sink and protecting the heat sink against stray EMI with the help of Laird SNC45-RXP and Coolzorb HD500. Lastly, design engineers at the company are helping significantly transfer heat away from sensitive components using Laird Tflex HD400 and Coolzorb HD500.

