

# Sheet Metal Operation

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**Abstract:** *Sheets are the foundation of metal operations manufacturing, which work, beating, and adding thin metal sheets. These processes are important in industries such as automotive, aerospace, and construction. This paper discusses the principles and analysis of operations such as bending, stamping, laser cutting, and welding. These techniques provide accuracy of  $\pm 0.1$  mm and more than 80% material efficiency. Car bodies in automotive, aircraft panels in aerospace, and HVAC systems in construction are their main applications. However, there are challenges such as material waste, high cost, and complex design. Based on the research of 2018–2025, this paper suggests that automation and AI are improving these processes. Sustainable materials and smart tools will revolutionize the field in future.*

**Keywords:** operations manufacturing

