



**VEHICLE A BIW PROFILE
DEVELOPMENT WITH SHEET METAL
FORMING METHOD**



smart

advanced manufacturing

ORGANISATION PROFILE

Insert brief description of the leading organisation: Name, Personnel, Size, Products/Services/Technical areas and R&D project expertise.

TOFAS TURK OTOMOBIL FABRIKASI ANONIM SIRKETI ,founded in 1968, is the only company in Turkey that manufactures both passenger cars and light commercial vehicles. Tofaş is a Koç Holding and Fiat Chrysler Automobiles (FCA) partnership in which each controls an equal stake.

With an annual production capacity of 450 thousand vehicles and with nearly 7 thousand employees, Tofaş is Turkey's seventh biggest industrial enterprise. Headquartered in İstanbul, Tofaş conducts its manufacturing operations at its Bursa plant, which occupies about a million m2 of grounds and has 350 thousand m2 of enclosed space.

Within the scope of the “World Class Production” (WCM) methodology applied in the FCA Group's 400 factories worldwide, Tofaş is the company with the highest score among all automobile factories. The company is also one of the group's two biggest R&D centers in Europe. Tofaş's plant produces Fiat Doblòs and Fiorinos as well as the Fiat Egea family's sedan, hatchback, and station wagon models. Marketed under different marque and model names in different parts of the world, Tofaş's Egea line is sold as “Fiat Tipo” in Europe and as “Dodge Neon” in Mexico. Developed and manufactured at Tofaş, the Doblò is also exported to the United States where it is sold under the ProMaster City name. Tofaş is also a distributor, handling the domestic sales of six marques (Fiat, Fiat Professional, Alfa Romeo, Jeep, Maserati) in Turkey.

PROPOSAL INTRODUCTION (I)

Vision: main project goal

The new sheet metal forming profile will provide a significant contribution to reducing pollution in all urban areas in terms of CO₂ emissions due to enabling the weight reduction of the produced BIW part. The profile will be manufactured in Turkey and will be implemented in the first instance on vehicles produced in Turkey and destined primarily for the European market.

Motivation: why the project is necessary

The weight of a vehicle is the predominant factor in terms of the reduction of emission and fuel consumption, so reducing the total weight of the body is crucial towards achieving lighter vehicles. The Sheet Metal Forming Method is to widen the realm of possibilities in sheet metal forming to include profiles with variable cross sections and so fulfill the demands of the automotive industry for more complex geometries as well as machines are designed for use with cold formed steel at very high strength levels even 90° angle possible maximum stiffness which makes this method so valuable to automotive manufacturers. Moreover, using high-strength steel for the sheet metal forming is that the material properties are more evenly balanced so that the same result can be achieved each time in one step. The sheet metal forming offers an alternative to the most commonly used hot or cold press forming methods because it is more flexible and cost effective.

Content: which are the developments to be made in the project

The sheet metal forming means that the incoming sheet passes several individually mobile computer-controlled roll stands that allow the finished profile to vary along its length and also makes it possible to curve the profile. The difference between conventional sheet metal forming and the sheet metal forming, in brief, is that conventional technology always produces a finished profile with the same appearance, while the sheet metal formed profiles vary along their length. The new sheet metal forming technology is also very flexible as profiles with different geometry can be fabricated by merely adjusting control of the roll movements. Implementing this manufacturing method to roof bows and similar profiles will provide a great contribution to automotive companies.

PROPOSAL INTRODUCTION (II)

Expected outcome: descriptions of the results to be obtained in the project

The project starts with the development of the part design, continues with the virtual validations, production method development, producibility analysis and ends with the verification of the industrialization which is intended to lead to mass production of the crash beam with the new sheet metal forming method soon after completion of the project. Scope of the Project; increasing percent of utilization sheet metal for production with the sheet metal forming, optimization variety of a BIW profile for reducing investment for the sheet metal forming and reducing radiuses and increasing angle of vertical wall on a BIW profile design will be main expected outcomes.

Impacts: what will be the expected market impact of the project

Our consortium is a collection of key critical partners that are well matched in terms of ambition and capability; with shared passion for the implementation of “light weighting” in industry. TOFAS has made light weighting a core part of its 2016-2021 technology roadmap. It sees further integration of high strength steels parts in its vehicles as a highly important means to achieving this goal. To meet its targets, TOFAS requires better production methods of production these steels to enable further uptake. The new sheet metal forming provides the ideal solution. We have two leaders in this new technologies (Ortic, Linde-Opsan) combining their skills to provide the market ready product.

Schedule: start and end dates for the project. Duration.

·Start Date (2021/07) ·Benchmarking and determination of design critics (2021/07) ·Design studies(2022/03) ·Virtual feasibility (2022/06) ·Prototype tool design and manufacturing (2022/09) ·Prototype line set up, Prototype Production (2022/12) ·Physical Tests Completion (2023/05) ·Evaluation of results (2023/06)

PARTNERS

Current Consortium: list of partners already involved in the project

LINDE OPSAN / Turkey

Partner search: type of partner searched and countries of origin (if necessary).

Partners needed for production line.

CONTACT INFO

Contact info: of the person coordinating the project proposal

Please do not hesitate to get contact with us for discussing more details of the project...

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