



April 14, 2021

# P R E S S R E L E A S E

## **Crafting FUSO vehicles for today and tomorrow: Mitsubishi Fuso reveals its Design Essentials**



**Kawasaki, Japan** – While automotive design is undoubtedly a well-known aspect of passenger car production and sales, its significance for commercial vehicles has long been overlooked. The product development process at Mitsubishi Fuso Truck and Bus Corporation (MFTBC/Mitsubishi Fuso), one of Asia's leading commercial vehicle manufacturers, has been quietly shifting industry conventions by incorporating a heavy emphasis on design. Product design for the FUSO brand reaches beyond the pursuit of appearances, marrying form and function to deliver advanced comfort and safety while minimizing environmental impact. At the Design Essentials event held on April 14 at its Kawasaki headquarters, Mitsubishi Fuso showcased its pursuit of a clear identity, simplification, and perceived quality through each stage of its design process for products that serve society's needs, today and beyond. Through demonstrations of its physical design, production design, and advanced design, visitors were invited to discover why, in this age of economy, Mitsubishi Fuso remains committed to perfecting the art of the commercial vehicle.

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## **The best of both worlds**

Design at Mitsubishi Fuso is situated within a global Daimler network, which allows the team in Kawasaki to mutually exchange ideas with more than 700 counterparts worldwide. Representing this exchange are Gorden Wagener, Chief Design Officer of Daimler AG, Benoit Tallec, the Head of Product Design at MFTBC and Daimler Trucks Asia, and an international, multi-generational team. The cross-border setup has enabled design at Mitsubishi Fuso to integrate global expertise and world-leading technology while safeguarding the uniqueness of FUSO trucks and buses within the Daimler Trucks lineup. The result is a product range that is at once a continuation of FUSO's heritage as a stalwart of Japanese "monozukuri," while also an interpretation of the forward-looking forms and precision foundational to Daimler vehicles.

## **Guiding principles essential to FUSO design**

In order to keep FUSO's heritage intact while employing future-forward approaches to design, Mitsubishi Fuso designers have operated with three distinct principles as their driving force.

### **A clear identity**

The first of these is establishing a clear identity and harmonious connection among all FUSO products. Here, "clear" indicates both a purity and cleanliness in form, as well as design that is immediately recognizable. Mitsubishi Fuso unifies the look of the front face through its entire family of trucks and buses, referring to the same motifs and design vocabulary across the range. At the same time, traits from iconic FUSO vehicles of the past fully resonate in the current family look. Each distinct model, however, accentuates a different aspect of this shared vocabulary, leading to individuality within uniformity. The face of the Aero Queen coach bus, for instance, contains plenty of elements that correspond to the face of the Canter, but also evokes a stronger sense of elegance and calm compared to its more agile sibling. Facial continuity is therefore maintained throughout the line, while different characteristics are emphasized in each model according to their purpose and use case.

### **Simplification**

Another principle driving design decisions at Mitsubishi Fuso is the search for

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simplification. The pursuit of the simple means more than omitting the superfluous; it means FUSO designers are constantly problem solving to address as many needs as possible in one fell swoop. Purely decorative gestures are eschewed for the simplest solutions that can marry form and function, with neither preceding the other. The roundness of a lamp, or the curvature on the side of the cab – all aspects of the vehicle are decided in a way that fulfills a variety of requirements at once. For example, production efficiency, aerodynamics, and structural balance are among the many considerations contributing to the integration of components seen on the latest Canter face.

### **Perceived quality**

First impressions count, and designers at Mitsubishi Fuso step up to the challenge of making them perfect. The strengths and functions of a vehicle, as well as the care taken to produce it, should be immediately visible when it comes to a FUSO product. Work at the Kawasaki Design Center also reflects the awareness that trucks and buses are a constant presence on roads everywhere. This means that in the eyes of the designer, each product is a brand ambassador, not only for FUSO, but for customers as well. The aesthetic considerations invested in FUSO vehicles are intended to live up to and reflect the pride that drivers and logistics providers take in their role in the world.

The three principles are applied rigorously through every step of design process, from physical modeling, production design, and even in the ideation of concept vehicles in advanced design work. Presentations at the Design Essentials event delved further into how they are fully integrated into these key contribution areas.

### **Physical Design**

The physical design process at Mitsubishi Fuso relies upon traditional Japanese craftsmanship in clay modeling, as well as more recent technology such as data modeling, 3D printing, and NC (numerically controlled) machine milling. Once given a drawing from their colleagues, clay modelers will begin shaping their real-world interpretation of the paper concept. Clay modeling for FUSO products is built on a trial-and-error process with active dialogue between the designer and modeler, repeated until the designer and modeler arrive

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at a shared ideal. The transition from drawing to clay is not completed in one step. The design team also implements even more minute adjustments to perfect the work done by hand, to ensure production-ready quality. The result of their physical modeling is translated into data through a scanning device in preparation for digital fine-tuning. The latest technologies in 3D printing and NC machine milling come into play when higher levels of precision are required for more intricately designed sections such as the grill or the FUSO three-diamond logo.



Behind this time-consuming yet all-important facet of design work at Mitsubishi Fuso is not only the pursuit of quality, but the correct expression of character. The criteria for a design is seldom verbalized outside of technical specifications, but there is always a balance that modelers and designers have learned to recognize in a satisfactory piece of work. Clay modelers at Mitsubishi Fuso have always strived to achieve purity in proportion, as well as “FUSO-ness” in their work. FUSO vehicles can be easily identified by their clean and fluid surfaces, standing in contrast to the rugged and geometric lines commonly seen in the world of commercial vehicles. Balanced proportions, gentleness, and elegance are major criteria that clay modelers try to achieve in their work, in order to imbue FUSO trucks with a sense of familiarity and naturalness when placed in an urban landscape.

Supporting this search for the ideal form is a strong foundation of collective experience and historical knowledge of the FUSO brand. At Mitsubishi Fuso, some clay modelers have

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developed their skills through careers in the field spanning over 30 years. These experts working at Kawasaki have been in their positions for several decades, gaining unparalleled knowledge of the process and an innate sense for what FUSO vehicles stand for. Mitsubishi Fuso relies on these veterans as the work of the clay modeler is something that cannot be easily taught, nor something that can be easily managed by sheer talent.

Clay modelers at Mitsubishi Fuso are also unique in their knowledge of, and involvement in multiple aspects of the design process. Each modeler has skills beyond shaping clay, including metal working and vehicle painting, which then feed back into the clay modeling process. For example, a clay modeler can apply their skills in metal working to build their own carving tools. Additionally, one individual is tasked not only with clay modeling, but also the other stages of the physical design process such as hard modeling and data creation. The depth and scope of the expertise held by the FUSO clay modelers further supports their uniqueness as true “takumi,” in contrast to the hyper-efficient specialization that is the trend in manufacturing.

FUSO modelers’ attention to detail and commitment to expressing the brand’s essence in their designs differentiates their work from the digital-only design processes of many competitors. The attention of these master craftsmen, or “takumi,” to even the smallest of details reflects Mitsubishi Fuso’s understanding that commercial vehicle design is not simply about aesthetic value, but maximizing the value of trucks and buses for customers. Compared to passenger cars, trucks and buses have more rigid parameters they must clear in order to be considered for sale, such as load capacity, dimensions, and wheel base. There is a comparatively limited space in which the design team can exercise its abilities. But taken another way, the differentiation Mitsubishi Fuso can offer within this limited space makes all the difference. Each decision taken by the clay modelers reflects their commitment to perceived quality and the optimization of every aspect of the commercial vehicle.

## **Production Design**

Mitsubishi Fuso design is always about form and function, pleasing eye and mind. It is about beauty, ease and harmony (Wa), as well as the creation of driving comfort, safety, efficiency and economy. The latest model of the light-duty truck Canter, which was showcased at this event, features a cab design that was renewed for the first time in 10 years with the Black

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Belt design motif. With this new motif, FUSO designers breathed new life into the Canter's speedy and light character positioning within the product range. Touches of modernity and solidity were part of this reinterpretation, through which the Canter has evolved into a sophisticated leading face of the current truck scene.



The value of the Black Belt design motif is not only limited to exterior design, but also extends its benefits to the vehicle assembly process to improve the superiority of FUSO products. With the adoption of the Black Belt design motif in the Canter, the structure of the front grill now enables greater efficiency in the vehicle assembly process while creating a sleeker, unified look.

This aspect of Production Design, and the implementation of the Black Belt motif, also applies to the common LED headlight. The common headlight design, which is used in the Canter, Aero Ace/Queen and Rosa, supports a more efficient development process for each vehicle. In addition, by introducing the common headlamp, it became possible to reduce the number of parts from three to two, comprising of only the lamp and the garnish. The integrated headlight design therefore contributes not only to a more efficient development of the entire vehicle, but also to the reduction of total development costs.

In addition, the Black Belt design motif, which was also introduced with the model year 2019

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coach bus "Aero Queen/Ace" and model year 2018 microbus "Rosa," provides FUSO products with an immediately recognizable identity, bolstering the brand's overall visibility within the commercial vehicles industry. Even with changes to exterior coloring or additions of customer liveries, the FUSO brand name and its unique design elements remain clearly recognizable. The importance of Production Design is therefore two-fold: it supports a common family appearance within the FUSO product lineup, but it also means significant time and cost benefits for Mitsubishi Fuso as well as customers.

Production Design also enhances the quality of all FUSO products by taking advantage of 3D surface data in the design development process for the front mask. By leveraging the technology of 3D surface modeling, FUSO designers can easily explore how vehicles will appear with fewer creases and folds, how the wind noise will be impacted, and even how assembly on the factory line will be ordered. The design team will always seek to connect all of these elements smoothly to produce a product with unified intention and superior aerodynamics. This is another way in which the simplification principle manifests in the design process at Mitsubishi Fuso; 3D surface modeling achieves several optimization goals at once. It contributes not only to beautiful exteriors, but also to better aerodynamics, efficient assembly orders, as well as the strength and durability of parts.

Color, materials and finish also play an important role in Production Design at Mitsubishi Fuso. These aspects of vehicle interior design directly impact the aesthetic appeal of the final product, but also enhance a vehicle's functionality for drivers. The interior of the "Rosa" exhibited at the Design Essentials event provides a sophisticated and luxurious feeling through choice of color and material. At the same time, designers made sure to distinguish the texture selection for various switches within the cockpit, boosting the intuitive usability of vehicle. Production Design therefore reaches beyond appearance for appearance's sake, but aims to achieve better comfort for the driver, and better efficiency, both in on the manufacturing line and in on-road use.

## **Advanced Design**

The shift to zero emission trucks and buses, as well as digitization, automation and the needs of an aging society, open up completely new dimensions for Mitsubishi Fuso Design. At Mitsubishi Fuso, we have a professional team dedicated to 'Advanced Design,' which tries to

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meld expected technical developments with predicted social trends and needs. These designers are currently envisioning the world in which we will be living in 2040. Their role is to shift boundaries and prepare Mitsubishi Fuso and the surrounding society for what the future will bring. Furthermore, certain aspects of Advanced Design also flow back into Mitsubishi Fuso's current series of products.

At the Design Essentials event, Mitsubishi Fuso exhibited its recent concepts for emergency vehicles, including future forms of drones. With these vehicles, Mitsubishi Fuso aims to explore further optimizations of natural disaster response in societies like Japan, while also examining possible future forms of fully autonomous trucks.

Additionally, visitors were invited to experience the 'virtual design studio', which has recently been established to make full use of cutting-edge virtual reality (VR) technologies and encourage collaboration among global Daimler colleagues. This 'virtual design studio' plays an important role in a post-covid world. With safety a top priority within Mitsubishi Fuso, this technology has helped the Design team stay on track of projects without sacrificing employee health. Through their VR platform, employees based in Germany, Japan, the United States, and India are working together simultaneously on projects in the pipeline.



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## **Exhibited Vehicles:**

\*All the exhibited vehicles are concept models. This does not describe any development plans.

- **The modular I.RQ (Intelligent. Rescue Truck)**

The I.RQ is an emergency vehicle energized by a fuel-cell drive. Its design is inspired by the current high-floored 4WD variation of the light-duty Canter truck. The high-floored 4WD achieves a unique position within the commercial vehicles market with its unmatched performance over rough terrain. The I.RQ takes these strengths and builds on them further with an autonomous driving feature, so that it can safely conduct rescue activities in difficult situations such as snowy or mountainous areas.

The connection between the body and chassis has been developed for modularity, allowing for the body to be exchanged depending on scenario and purposes. This means that a single vehicle is able to respond to a variety of situations and environments. For example, while a natural disaster may initially require a tipper truck to carry away debris from a blocked road, the tipper could also be exchanged for a simple van body later in the same day to deliver food and clothes to evacuees.

With these features, the I.RQ proposes a means of increasing the efficiency and effectiveness of future emergency vehicles. It can act alone, or connect with several other vehicles on coordinated missions.

Furthermore, each I.RQ is envisioned to be equipped with an automated HeliDroid, which can precede the I.RQ to deliver first aid kits to victims and conduct primary surveys in particularly challenging conditions.

- **The HeliDroid**

The HeliDroid is presented as one possible future vision for a transport drone.

In line with the Daimler Truck purpose statement, "For all who keep the world moving," Mitsubishi Fuso constantly remains open to considering any possible forms of transportation. Designers at the Kawasaki Design Center already have in their vision a future where commercial vehicles will no longer only drive on roads, but also fly in the air. HeliDroid is our suggestion to this possibility.

Although the HeliDroid has been designed with rescue scenario in mind, it can of course be help in other situations. In combination with the lateral, on-road movement covered by existing vehicles, the HeliDroid can provide better mobility solutions to address needs

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that can only be solved with vertical transportation. For example, it could potentially reduce driver workload during urban deliveries, with its ability to easily cover the distance from a vehicle on the ground to an upper level of a high-rise condominium.

With a 1.8m wingspan, the HeliDroid delivers objects by carrying them in a compartment under its body. It flies autonomously and possesses a digital personality to interactively communicate with the individuals operating it, or those being aided.

The Advanced Design team also has followed its pursuit of simplification in the design of the HeliDroid. With the integration of commonly exposed parts into one solid surface, not only does the vehicle look more unified, it also delivers higher energy efficiency and user safety.

- **The Manta**

The Manta is another concept for the future of the drone.

Simplification comes up here again, as a core guiding principle of FUSO design. As the components of industrial products such as vehicles approach higher levels of integration, the overall shape of the product usually tends to become simpler and more spherical. This is oftentimes a reflection of technological advancements over time, with the smartphone and the airplane providing just a few examples of the common trend. The form of the Manta presented at the Design Essentials event is almost a physical representation of this impulse towards simplicity. The highly integrated shape of the Manta achieves more than a futuristic look, however – its smooth surfaces also serve to support higher transportation efficiency and better user safety during its flights.

## **Virtual Design Studio**

In addition to utilizing virtual reality (VR) technology in our daily design activities, Mitsubishi Fuso has recently established a virtual design studio to support the international exchange required in key projects. As part of the global Daimler Trucks network, those in Kawasaki have many opportunities to collaborate with colleagues overseas, such as in Germany, United States, and India, regardless of nationalities or time differences. With VR glasses and controllers, Daimler Trucks designers can step into the same virtual studio beyond borders. Contributors from various regions around the world are then able to see the images and models from the same angle, leading to more productive discussions and faster decision making. This method of online collaboration has become increasingly appropriate in a post-

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covid world where travel is both less feasible and needed.

In the virtual design studio, designers can also see how vehicles run in different environments, and estimate how their creations interact with their surroundings. Vehicles often operate in more than one type of setting. In addition to cities, they may go through mountains, along the coast, or even through deserts. In our virtual design studio, designers can place potential vehicles within various programmed conditions to account for this diversity of use case. With aid of these technologies, the virtual design studio aims to provide the world with the trucks and buses that serve society in the most seamless manner possible.

Another key fact of the virtual design studio is that it enables designers to investigate the interior and exterior of vehicles more efficiently. Until now, designers had only been able to study either the vehicle exterior or interior at any one time, and explore the impact of decisions on those two aspects independently. In a VR world, however, designers can break any part of a vehicle to see inside. Choices for the interior, such as color and material selections, can be exchanged and reviewed almost instantaneously. To repair the deconstructed design, they simply need to click a mouse once or twice, allowing considerable accelerations in the overall product development process.

## **Why does Mitsubishi Fuso invest in Design?**

### *Mitsubishi Fuso produces professional tools*

In a world that moves at an ever-quickenning pace, the time and resources required to perfect the design for a truck may at first seem unjustifiable. Yet Mitsubishi Fuso continues to invest in this aspect of product development with the belief that a commercial vehicle is more than just about moving something from A to B. Every truck or bus on the line represents an opportunity to provide the most perfect tool possible for drivers and logistics operators. For the Mitsubishi Fuso design team, this means deciding each detail so that the FUSO vehicles running in more than 170 markets around the world can be the most durable, safe, and environmentally friendly business partners.

### *Mitsubishi Fuso contributes to society*

Design at Mitsubishi Fuso is also deeply rooted in the understanding that trucks and buses serve communities. FUSO vehicles exist in the day to day, carrying both people and goods where they need to be. All models are therefore intended not only to run as reliably and safely as possible, but blend into any environment and have a minimal footprint. The FUSO design

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team envisions its vehicles not just as their own entity, but as part of landscapes and interactions. And, as the necessity for environmentally conscious societies becomes clearer and clearer, vehicle design at Mitsubishi Fuso is also evolving into a discipline that explores how trucks and buses can continue to keep the world moving sustainably, many decades down the road.

*Mitsubishi Fuso creates products that attract*

Designers of FUSO products understand that trucks and buses are moving ambassadors, not only for the brand, but for the business owner. FUSO vehicles are therefore intended to be beautiful machines that communicate the pride of the Mitsubishi Fuso team as well as our customers. The pursuit of attractive design also means creating tools that people will want to rely upon day in and day out, and involve in their endeavors. This ultimately reflects the core of Mitsubishi Fuso's role in the world: we develop mobility solutions to embrace a better life for people and the planet.

As Benoit Tallec comments, "FUSO trucks and buses are more than just simple transporters. They're made to be participants in our world, a world that's transforming day by day. That's why we didn't compromise on our design principles for our current product lineup, and why we're already applying them to our vision of the future."

Related photos can be downloaded from the Daimler Media Site:

<https://media.daimler.com/marsMediaSite/ko/en/49589037>

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