DHL's 'City Quiet, City Safe' concept truck features Don-Bur's Teardrop aerodynamic bodywork, along with a PIEK-certified tail-lift and reversing alarm

There's far more to specifying a body optimised for mounting on your chassis cab than price alone. Toby Clark examines some of today's key technical considerations

Build a better body

Specifying rigid bodywork might seem simple: it's just a box, after all. But there are plenty of considerations apart from price. That's important to remember, given that purchasing continues to change, with fleet engineers increasingly influenced by constraints from finance. As Don-Bur marketing manager Richard Owens puts it: "They have different demands put on them, and their range of functions is wider than ever, but we are here to help."

So what's changing technically? Starting with design and construction methods, these have improved – giving bodybuilders more confidence that payload and structural performance will be as predicted. Don-Bur, for instance, sends data directly from its Solidworks CAD (computer aided design) software to a laser cutter. Its latest £1 million installation can handle sheets of 20mm steel at sizes up to 6.5 x 3.1m. Cutting speed is up to 85m/minute with an accuracy of 0.05mm/metre; edges are clean; and the unit can also handle material down to less than 0.5mm for precision components such as grilles.

Each piece can also be etched with a unique part number, to help stock control and reduce incorrect fitting: "The main issue for us is time," says Owens. "It's a far more structured and managed production flow than before." Don-Bur is also looking at automated brake presses for bending components.

CITY QUIET, CITY SAFE

And the Whole Vehicle Type Approval process is also now well established. "Apart from the oddballs for which we get IVA [Individual Vehicle Approval], we've been going through NSSTA [National Small Series Type Approval] rather than European Whole Vehicle Type Approval," explains Owens.

However, this might have to change, as Don-Bur's streamlined 'Teardrop' trailers and bodywork – as used on DHL's recent 'City Quiet, City Safe' concept 18-tonner – have attracted the attention of continental operators. "The UK market tends to be a little different, in terms of its diversity," says Owens, adding that it's not just the bodywork that's different. "In Britain, we tend to have an ex-works model. In Europe they expect [the vehicle] to be delivered to the doorstep licensed and ready to drive away."

Aerodynamic bodies are not just a marketing tool: Owens insists the Teardrop is not the radical package it was in 2007. "People are approaching aerodynamics more pragmatically, and saying we need to look at this more seriously," he says. And he explains: "If you look at the cost versus benefits for aerodynamics on rigid bodywork, operating speed becomes important."

Aerodynamic drag is proportional to the square of speed, so it becomes much more important at high speeds.

Noise reduction and PIEK

An increasingly important aspect of urban and city centre operations concerns noise – which is why firms like Don-Bur are working hard for operators in London to make their vehicles quiet.

While equipment such as tail-lifts can gain approval from the Dutch PIEK organisation (recognised by the UK's Noise Abatement Society), Don-Bur's Richard Owens sees the approval process as "really just a dB threshold". To pass, each item must emit no more than 60dB(A) at 7.5m. "Although [PIEK] is something people recognise, it would be desirable to consider the whole vehicle, along the lines of WVTA [Whole Vehicle Type Approval], and redefine the way vehicles are approved for urban areas."

"People are approaching aerodynamics more pragmatically, and saying we need to look at this more seriously"
Richard Owens

Conversely, within an operating range of zero to 40mph the benefit is relatively small. "So, yes, if you use a rigid for trunking and secondary distribution, then it is worth looking at." Some operators have seen fuel savings of 8–9%, he claims, but for local deliveries there is little benefit.

For stop-start operations, weight is more significant, and a variety of panel materials is now available. Don-Bur's website clearly outlines the pros and cons of typical materials, from conventional GRP-faced ply to Technolite aluminium honeycomb. The latter weighs less than half a comparable GRP panel (around 7.4kg/m^2 for a 20mm-thick panel, against 16kg/m^2 for GRP).

However, Owens warns: "It is a particularly soft panel," which requires careful design to keep flat and protected from impact. Omnia polypropylene/GRP honeycomb is even less dense (4.8kg/m^2 for a 30mm-thick panel) but also more flexible. "With something small like a 7.5-tonner, you can get away with it," advises Owens.

Neil Brandrick, managing director of JC Payne, adds another note of caution. "We've actually found that on some of the bigger [vehicles] there's been a slight readjustment the other way. Certain operators two to three years ago were adamant that payload was the way to go, so they wanted lightweight panels and associated designs. But then the use of the vehicles wasn't suitable. They were giving them a bit of a bashing. So the cost savings from transporting more were being offset by damage to the vehicles. Now it's time to renew these vehicles, they are moving away from light weight."

SHARP OPERATION

A useful compromise is something like Don-Bur's Blade material, consisting of an HDPE (high-density polyethylene) foam core with a galvanised and painted steel skin. A 7.5mm-thick panel weighs 11.8kg/m^2. "Blade is a bit lighter than GRP but amazingly tough," says Owens. "You can literally take a hammer to it." The material is also highly resistant to corrosion and water ingress, and provides a good surface for graphics.

"Everything has to be approached on a case-by-case basis," comments Owens, adding that, for example, there can be difficulties with load restraints. Brandrick agrees: "With some panels being only 11mm thick, you can bond strongly with an adhesive but not with a screw. In fact, because it's been bonded so well, if you've got a heavy load fixed to the side panel, then rather than the interior restraint pulling away from the panel, it's been pulling the panel away from the side wall."

Floor materials also need careful thought and you need to define what type of distributed or point loads your vehicle will undergo. This is particularly important for the latest variant of JC Payne's range of box vans and Lutons. Its low-frame 3.5-tonners use low-height chassis cabs from the likes of Peugeot and Citroen, and even the rear wheel drive Mercedes-Benz Sprinter, to offer a loadbed height down to 600mm.

The chassis outriggers are not meant to support the floor, explains Brandrick. "So we've worked with Omnia to supply flooring with sufficient bending resistance." Construction is mainly bolted – "for a combination of ease of repairability and production" – but Mercedes insists that the bulkhead be bonded to the B-pillar at the cab rear.

And Mercedes has another requirement – related to its ESP stability systems. "They are asking our engineers for a calculation of the centre of gravity, on the basis of materials used and height of the body," explains Brandrick. "We're finding on these new chassis that Mercedes needs to revisit the vehicle at PDI [pre-delivery inspection] and reprogram the stability control."

For Brandrick, this illustrates the importance of interaction between the chassis manufacturer and the bodybuilder. "Type approval and Euro 6 have all aided the communication and the expectation of the chassis manufacturer that the bodybuilder knows what he's doing," he says. TE

JC Payne's low-frame Luton