BLADE®

Panel

DON-BUR
BLADE PANEL

For several years now, DON-BUR has been pushing and re-defining the limits of trailer and rigid bodywork design and panel specification has come under greater scrutiny as more panel types become available at affordable prices.

It is, however, difficult for any fleet manager to a) understand what is currently available b) appreciate what each type offers in terms of features and benefits and c) be able to make a truly informed decision about future vehicles. With this in mind, we have put together a simple guide of the most common panel types Don-Bur offers; benchmarked using the following properties:

- **Strength**: how well the panels inherently form the body strength
- **Weight**: critical if the operation is weight sensistive or if you are driving down fuel costs
- **Durability**: a new lightweight panel with poor impact resistance is no use to anyone.
- **Recyclability**: is it green?
- **Ease of repair**: make sure your maintenance costs don't sky rocket.
- **Aesthetics/ Paint & Livery Application**: how does it look now or in 10 years time?

Now comes the exciting launch of an advanced new composite panel type; the "BLADE®" panel. This cutting edge panel is so named because of its lightweight, slim and strong construction, designed and manufactured to withstand many years of heavy use at an extremely cost-effective price. We're so confident about its performance and durability, we've given it a 5 year guarantee.

Composite Panel Structure:

At just 7.5mm thick, the "BLADE®" panel comprises a high density Polyethylene foam core (HDPP), faced on both sides with 0.5mm 80,000 yield, hard steel sheeting. The panels are finished with a 5 year guaranteed hot dipped galvanisation with polyester baked paint top layer.

Hot-dip galvanizing produces zinc carbonates when exposed to the environment, thus protecting the coating metal and minimising corrosion.

- **Reduces standard trailer weight by 250kgs**
- **Provides additional internal width**
- **Exceptional impact resistance**
- **High degree of rigidity**
  - **essential for integral trailer strength and durability**
- **Superior fixing surface for Load-Lok rails**
- **Completely Recyclable**
- **Simple to repair**
- **Eliminates panel water ingress**
- **Smooth high gloss finish**
  - **Ideal for Livery application**

Strength

- GRP panels BLADE® panels, due to their composite material construction, display exceptional strength qualities for both rigidity and acute impact resistance; comparable with GRP faced plywood.

Weight

- Although not the lightest material available, BLADE® panels provide excellent weight savings (26.25%) in comparison to GRP faced plywood.

Durability

- Under salt spray accelerated test conditions, it has been proven that BLADE® panels perform well in excess of uncoated Stainless Steel. The core does not de-laminate or deteriorate like Plywood

Recylability

- GRP faced plywood panels are not viably recyclable
- Technolite® panels can be smelted.
- BLADE® panels can be delaminated. The Steel facing is smelted whilst the HDPE is granulated.

Ease of Repair

- Technolite® damage can be routed out and filled with standard bodywork filler.
- BLADE® panel damage is less likely due to higher impact resistance but moderate damage can be simply filled and re-finished.

Paint/livery Application

- Vinyl livery has significantly better adhesive properties with high gloss/machined finish panels, such as Technolite® and BLADE®.

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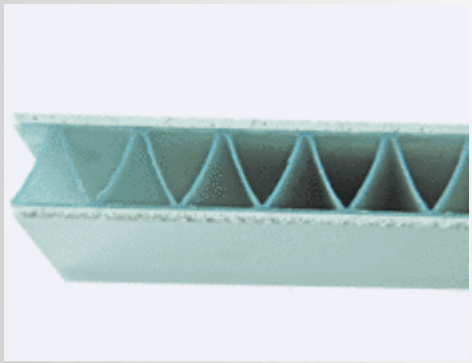
Panel Types (To Scale)

Standard GRP Faced Soft Plywood

“Omnia” Polypropylene Honeycomb

“Carbofont” Polycarbonate Delta Core (Not to scale)



“Technolite®” Aluminium Honeycomb

“BLADE®” Steel Faced High Density Polyethylene Foam

Panel Comparison Specification Sheet

	Standard GRP	Omnia	Carbofont	Technolite®	BLADE®
Appearance					
Material	Plywood/GRP	Polypropylene (PP)	GRPR/PC	Aluminium	Polyethylene (HDPE)/Steel
Construction	Soft, plywood core, faced with glass reinforced plastic	Polypropylene honeycomb core faced with fibreglass reinforced polypropylene sheets	Glass Re-enforced Polyester Resin skin with Polycarbonate delta core. Gelcoat RAL 9010 finish	Aluminium honeycomb core faced with aluminium sheets	High density polyethylene (HDPE) foam core. Hot dipped galvanisation steel skin (80,000 yield hard steel). Polyester baked paint.
Weight (kgs/m²)	16	4.8	8.35	7.4	11.8
Thickness (mm)	20mm	30mm	20mm	20mm	7.5mm
Surface Finish (Graphic decals have superior adhesion to smooth surfaces.	Smooth	Dimpled	Textured	Gloss smooth	High gloss smooth
Skin Sheet Thickness (mm)	1	0.7	1	1	0.5
Skin Fixation Strength	7	3	5	6	9
Rigidity Scale	8	3	7	9	6
Acute Impact Resistance Grade	8	7	6	6	9
Environmental Effect	Moisture ingress into plywood leading to eventual delamination and core deterioration.	Rigidity is affected by variances in heat. Material also affected by UV light.	-	NIL	See TR044E-02 corrosion test
Damage Degradation	Water ingress into plywood leading to delamination, surface deterioration and rot.	As above	-	Subject to surface oxidisation if paint surface is broken.	Self-healing zinc skin. Subject to oxidisation if galvanised surface is broken.
Flammability	Self fuelling active flame.	Self fuelling active flame. Includes glass retardant.	Self fuelling active flame. Includes glass retardant.	Melting point 660°C	Auto-extinguishes
Recyclability	Not recyclable	Granulation, provided surface is pre-treated. Post purification and additives required.	Granulation, provided surface is pre-treated. Post purification and additives required.	Melts to pure recyclable product. Low cost process.	Steel skin can be melted. Polyethylene core can be granulated. Post purification and additives required
Absorbency	Moisture content fluctuates between 8/12% at time of milling to 30%. Trailer can fluctuate in weight by +/- 240kgs	0.03%	-	NIL	< 0.01%

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BLADE® TR044E-02 Accelerated Corrosion Test

1000 Hour (80 days), Salt Spray Of Sheared panels.

Summary:

Four BLADE® panels were sheared to size and suspended in the salt spray booth for 1000 hours at ASTM B-117 specifications. The panels were hung from a hole drilled in the panel one inch inboard from the edge in the vertical position. The panels were inspected at 250 hour intervals for creep of the salt spray under the white coating. The panels were marked 1 through 4 with each side being further denoted by 1A,1B,2A,2B,3A,3B,4A,4B. Panel 1 size was 15-1/2 inch by 20-7/8 inch. Panels 2,3,4, were each 13 inch by 15-1/2 inch.

It is not possible to calculate a real-time equivalent due to the complexities of the corrosion process; however, *Stainless Steel subjected to the same conditions would expect to show oxidisation (rust) after just 100 hours*. Under normal operating conditions, a trailer's BLADE® panels would be expected to retain their appearance for a minimum of 5 years (Guaranteed).

Test results:

- 250 hour inspection
  All panel sheared edges no change looks good. One-eight inch creep bubbles around drilled hole holding panel in salt spray on sides 1A, 1B, 2B.
- 500 hour inspection
  All panel sheared edges no change looks good. One-quarter inch creep bubbles around sides 1A,1B,2B. All other drilled holes have 1/8 inch creep bubbles.
- 750 hour inspection
  Panel 3A has a 2 inch length of 1/8 inch creep bubbles at the lower right corner. This corner appears to have been dented upon delivery to lab at this area. Panel 1A has a ½ inch length of 1/8 inch creep bubbles at the lower right corner. All other panels no creep bubbles on the sheared edges. The drilled holes all have creep bubbles ranging from ½ inch from the hole to 1/16 inch.
- 1000 hour inspection
  The drilled holes have creep under the coating from the hole 1/8 inch to ¾ inch from the edge.
  Salt spray creep bubbles have appeared on all panels at the sheared areas to varying degrees. Only panel 4A has no creep bubbles at the sheared edge. Table 1 on the next page exhibits the total amount in inches of sheared edge, the amount in inches of creep, the depth of average creep under the white coating, and the length and depth of the worst creep edge at the end of test 1000 hour inspection.

Creep of salt spray under white coating at sheared edges at end of testing

Panel number	Total length of sheared edge	Total length of sheared edge with salt spray creep	Average amount of salt spray creep of total sheared edge	Average depth of salt spray creep	Greatest penetration of salt spray creep depth and length
1A	72.75 inches	12 inches	16.6 percent	1/8 inch	¼ inch deep by 2 inch long
1B	72.75 inches	9.5 inches	13 percent	1/8 inch	None greater than 1/8 inch deep
2A	57 inches	5 inches	9 percent	1/8 inch	None greater than 1/8 inch deep
2B	57 inches	1.5 inches	3 percent	3/16 inch	None greater than 1/8 inch deep
3A	57 inches	6 inches	11 percent	3/16 inch	5/8 inch deep by 1 inch long
3B	57 inches	2.5 inches	4 percent	1/8 inch	None greater than 1/8 inch deep
4A	57 inches	No creep	0 percent	No creep	No creep
4B	57 inches	10.5 inches	18 percent	1/16 inch	1/8 inch by 2 inch long

Conclusion:

The drilled holes had salt spray creep from the edge of the hole anywhere from 1/8 inch to ¾ inch. This is to be expected when drilling which has occurred in previous tests but is mentioned here as reference. Sheared edges did not exhibit any signs of creep until 750 hours in the salt spray. Then, panels 3A and 1A combined between the both of them had 2.5 inches of 1/8 inch deep creep while all other panels were okay. So even at 750 hours the sheared edges were doing well. At the 1000 hour end of test inspection, only panel 4A had no creep but the other panels for the most part only had 1/8 inch or less creep depth under the coating with smaller areas of 2 inch or less which went deeper. The total percentage of sheared edge with salt spray creep ranged from 0 percent for panel 4A to 18 percent for panel 4B with an average percentage of all panels of 9.3 percent. It was also observed that the side of the panel which is opposite the shearing knife appeared to have a greater amount of salt spray creep present. This is the side that is not rolled over by the shearing knife. Sheared edges still exhibit the best resistance to salt spray creep over sawing and even machining. For example, in 1000 hour salt spray tests the table below illustrates this point.

Edge preparation comparison for 1000 hours in salt spray

Test request	Type of edge joint	Preparation of edge.	Hours in salt spray.	Time in salt spray when creep first appeared	Average depth of creep from edge at end of 1000 hours.	Average length of creep for total length of edge at end of 1000 hours.
TR044D-02	Ship lap	Sawn	1000	125 hours	3/8 inch	100 percent
TR044F-02	Ship lap	Machined or milled	1000	250 hours	3/16 inch	34 percent
TR044E-02	regular sheared edge	Sheared	1000	750 hours	1/8 inch	9.3 percent

Conclusion

The DON-BUR BLADE® panels represent the next step in the continual evolution of trailers and rigid bodywork with the aim to:

a) Significantly reduce the impact to the environment
b) Provide cost-effective solutions
c) Manufacture strong, durable componentry

Its combination of inherent strength and resistance to damage exceed that of any other panel type in use.

It saves significant weight which, in turn, saves fuel…

…a combination which has never before been achieved.

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