

## Testing Certification

### VISIPLAS Pallet Racking Upright Protector

#### Test Requirements

No specific test requirements are set down for testing of products used to reduce the damage resulting from impacts caused during the loading and unloading of pallet racking.

FEM 10.2.02 Section 2.6 provides guidance for the design of upright guards required to be located at the corner uprights of all racks between cross aisles and gangway intersections.

The upright guards must be designed for an energy absorption of at least 400 Nm at a distance between 100mm and 400mm above floor level. The upright guard is required to be a minimum of 400mm high.

The damage assessment criteria as defined in FEM 10.2.04 have been used to evaluate damage to uprights.

Based upon the information provided in FEM the following test has been used to evaluate the VISIPLAS product and its rack upright protective characteristics.

#### Test Equipment

A test jig as per drawing DB190111/2 consisting of two vertical channel guides attached to a 310mm wide x 700mm long x 10mm thick baseplate was devised to allow a weight to be dropped from above the upright section.

The upright section is located on the baseplate with stub sections of bracing section at 305mm centres that bolt into the flanges of the upright as in a normal frame attachment. Note that in practice the load transmitted into the front upright is dispersed via the bracing pieces into the rear upright.

A composite weight of 51.0kgs was prepared to include a top lift eye, profiled side sections to fit the vertical channel guides and an impact face to simulate the impact surface of a pallet or forklift.

### **Test Procedure**

Three tests were conducted using the following materials:-

762mm lengths of HIRACK 90L upright section 2.0mm thick.

For the upright protector test the load used is as for the FEM requirement for the upright guard, being 51.0kgs dropped over 800mm giving 400Nm.

The product tested was the VISIPLAS AVB upright protector on a 90mm front face width upright.

### **Test Evaluation with VISIPLAS Protector**

Refer to photos below.

The test weight was dropped from a height of 800mm above the impact surface.



*This photo shows the VISIPLAS fitted to upright prior to impact.*



*This photo shows the VISIPLAS during the impact.  
Note the deflection of the VISIPLAS as the impact force is absorbed.*

The VISPLAS protector showed minor rib deformation and evidence of penetration of the ribs into the shock absorbent layer. However the VISIPLAS reformed itself to its original dimensions. The upright section sustained minor damage resulting in 0.7mm average bending of the upright in the direction normal to the aisle, which represents less than 25% of the allowable bending defined in FEM 10.2.04.

### **Test Evaluation without VISIPLAS Protector**

Refer to photos below.

The test weight was dropped from a height of 800mm above the impact surface.



*This photo shows the upright without VISIPLAS prior to impact.*



*This photo shows the upright during the impact.*

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Test results showed that the unprotected upright section in all cases exceeded the damage level allowed by FEM 10.2.04 and would require replacement. FEM 10.2.04 allows 3mm maximum bending of the upright section in 1.0metre gauge length in the direction normal to the aisle. The average amount of bending for the upright impacted without VISIPLAS was 7.1mm, which is 235% of the allowable.

**Certification Statement**

I hereby certify that the VISIPLAS Pallet Racking Upright Protector has been tested and conforms in accordance with the guidance of FEM 10.2.02 and FEM 10.2.04.

*Andrew Baigent.*

Date: *4/4/12*

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