



## FLOOR SCALES ARE NOT ALL CREATED EQUAL

A marketplace search of low profile floor scales shows some apparently fantastic bargains. This market sector is very competitive and some prices have dropped dramatically in the past few years. How can this be, are they not all the same, they all do the same job. They all have a platform, four loadcells, four adjustable feet, a junction box and an indicator. Many are trade approved.

Unfortunately they are not all the same. The market is well stocked with a number of lightweight models. These are acceptable as long as the loads are evenly spread and your staff treat the scale as though it was their own. This scenario is unusual and the normal treatment given to floor scales is quite different. Comparisons reveal the weaknesses inherent in the lightweight designs.

## DESIGN CRITERIA

### *Light v Heavy Duty.*

A prime consideration in the selection of a floor scale is the duty it is expected to perform. Consider the loads likely to be placed on the platform. Are they always relatively light loads, evenly distributed across the platform or do they include relatively high concentrated loads that are not evenly distributed across the platform. The small wheels on pallet jacks generate very concentrated loads. RED DECK is structurally engineered to support the full load concentrated on any side without deformation.

Of equal consideration is the way the loads are placed on the scale. Forklift drivers vary considerably in their skill and care levels and loads frequently arrive with considerable vertical and lateral movement. These loads can be placed off centre. Loads can also be applied using a crane, via pallet truck or hand stacked. RED DECK is designed to be able to handle

heavy duty work, concentrated loads, off centre loads and severe applications.

### *Accuracy*

The scale should weigh accurately through out its range, it should return to zero when the loads are removed and scale should weigh accurately with both increasing and decreasing loads.

### *Design Requirements*

Our engineers faced the challenge of ensuring the platform was strong enough to support the load, did not deflect when the load was applied and to isolated the load cells from adverse extraneous forces. Remember the platform is a shallow structure supported only at the corners.

## STRUCTURAL DESIGN

### *The Platform Load Channel*

Each platform is a long beam supported at each end. Good design must ensure rigidity under adverse loading conditions so that deflection of the platform is negligible. The basis of this rigidity is to emulate the standard rigid structural member, the I beam. The scale deck plate forms the top compression flange connected by a vertical web to the bottom tension plate. A review shows that many manufacturers had ignored or taken minimal advantage of this basic engineering principle. Some use a simple vertical flat bar plate welded to the deck while others used lightweight tubing. The former lacks the bottom tension plate necessary for rigidity. A lightweight tube goes some way towards emulating the I beam but lacks the strength necessary for rigidity. RED DECK uses a full strength channel welded to the top plate. These sections fully encompass the principles of the I beam.

### *Underdeck Support*

The under deck also needs strong support to ensure minimal deck deflection in any direction and to support the deck against concentrated point loads over an unsupported deck sections. Decks that are reinforced with flat bar welded diagonally across the underside of the deck or those with lightweight tubing lack the strength to prevent local dishing of the deck or to prevent the whole deck deflecting when the load is placed out to one side. The RED





DECK design provides proper structural support across the full deck.

### ***Loadcell Mounts***

The loadcell mounts need to be rigidly attached to the scale. They should be attached to the channel section and form part of that structure rather than be attached (usually by welding) directly to the underside of the Deck plate. The latter method allows for both local and global deck deflection exacerbating the inaccuracy. In extreme load conditions this deflection could become permanent. The RED DECK design attaches the loadcell mount to the load channels for maximum strength and rigidity.

### ***Loadcell requirements***

Good loadcells are very accurate and repeatable, provided certain design and mechanical considerations are followed. Loadcells are designed to work with the load applied perpendicular to their axis. If the load is not perpendicular or a torsion force is applied then the cell will not be accurate. If the deck deflects under load then the loadcell will no longer be parallel to the floor and the applied loads are no longer perpendicular. A platform deflection of 5 degrees will produce a 0.4% error, 12kg on a 3000kg x 1kg scale.

The RED DECK series uses our famous PT PSB approved loadcells. These highly respected cells are built of high quality tool steel, electroless nickel plated for superior corrosion protection and sealed to

IP67 standard. Each PSB loadcell is carefully matched to a rigid standard in our factory and tested twice before issue. Any PSB cell will match with any other PSB cell. These and their cables are enclosed within the channels providing protection against damage. Alternative Stainless Steel and tool steel loadcells are available.

### ***The Red Deck***

The PT RED DECK series provides exceptional rigidity even under extremely concentrated loads. The underside between the load channels is strengthened with heavy duty intermediate cross members to minimise unsupported areas of the deck plate and preventing dishing under concentrated point loads. The loadcell mounts are attached to the load channels rather than the deck plate, eliminating a source of distortion.

### ***On the Ground***

Even the best designs will deflect a small amount under extreme loads. Loadcells also deflect a very small amount. These deflections invariably impose side and torsion loads on the loadcell. The effects of this essential deflection can be accommodated by the design of the foot and are made worse by a poor design. A good foot design has the ability to negate the effect of small deflections. It also compensates for uneven floors and accommodates side loads so that the scale easily returns to its Zero state. Many scales retain side loads through the rigidity of the foot and will not come back to zero

Our standard swivel foot provides a seats a ball between two shallow cups that is the perfect arrangement to accommodate small deflections and misalignments. A rubber boot protects the floor from marking and prevents the scale from slipping. Both tool steel and stainless steel models are available in our standard range to suit a variety of needs. The swivel foot is a common component widely used in the manufacture of quality weighing platform scales.



Our newly designed premium range of swivel feet are machined from stainless steel to provide resistance to the harsher environment and hardened for durability.





The design is self draining in the event of wash down, spills or outdoor installation and prevents the accumulation of dirt or debris that could interfere with correct operation. The newly designed model is simply two solid parts with a self aligning ball motion, all assembly joints have been removed.



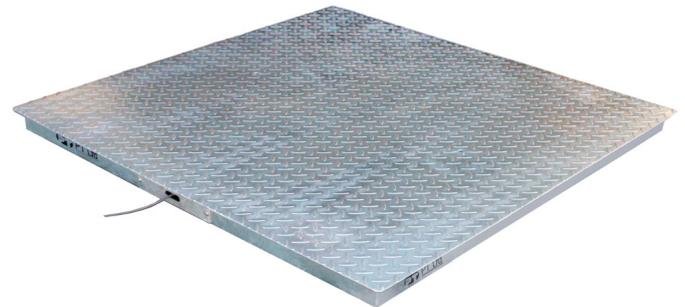
lifting eyes screwed into the two fittings provided in the top plate. Five metres of connecting cable is fitted as standard.

### **RED DECK GALVANISED**

Full hot dip galvanising provides superior corrosion resistance to this premium strength model. Built to

### **Loadcell and Cable Protection.**

Not all floor scales on the market are fitted with an adjusting junction box. Some rely on “matched” cells with no adjustment capability for individual cells. All the RED DECK series are fitted with a junction box usually installed within the load channel and accessed through a small hatch in the top deck or within a cross support accessed via a side hatch. The junction box is equipped with an individual trimpot for each loadcell. This is not required with new matched loadcells but allows for wear and damage later in life. Each scale is fitted with 5m of external cable threaded via a strain relief cable gland.



the same structural design as our RED DECK painted model the structure is hot dip galvanised for superior corrosion protection in adverse and wet environments.

## **RED DECK VERSIONS**

### **RED DECK POWDER COATED**

Constructed of mild steel channel sections welded to the diamond tread top plate and powder coat finished, the RED DECK is designed for rough commercial environments and where high concentrated loads are regularly applied to the scale. An aluminium junction box is standard and the scale is certified legal for trade in Australia and New Zealand for class III, 3000 divisions. Lifting the scale is easy using

### **RED DECK STAINLESS STEEL**

Particularly suited to the food industry the RED DECK Stainless is manufactured in stainless steel to the RED DECK structural Design. This version is fitted with a waterproof stainless steel junction box. This model can be fitted with Tool steel (legal for trade) or stainless steel loadcells for complete corrosion resistance.

### **OPTIONS/ACCESSORIES**

- Access ramps**
- Anchor Plates**
- Indicator Stand**
- Premium Swivel Feet**