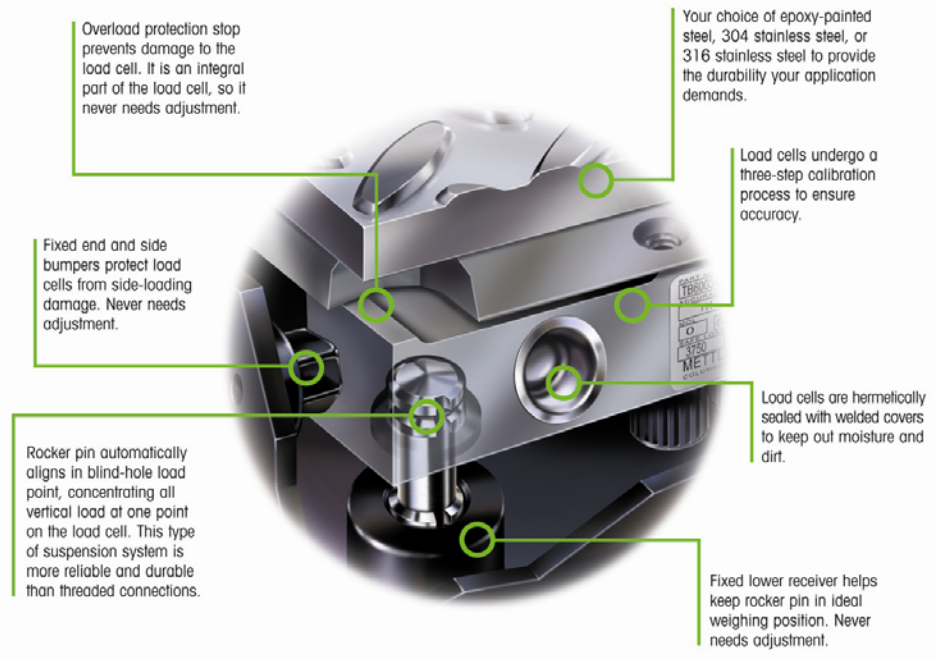
Portable Floor Scales – new technologies increase accuracy, reduce weight and promote sanitation.



The present day design of a portable floor scale has not changed significantly in the last decade. Typically a footed floor scale is placed on frame with wheels and a handle. The wheels in a lower position allow the scale to be moved and in a raised position allow the scale to weigh. Generally they are clumsy and heavy to maneuver, are not as accurate as a stationary scale, and provide far too many nooks and crannys where contaminants can hide when used in applications where sanitation is and issue.

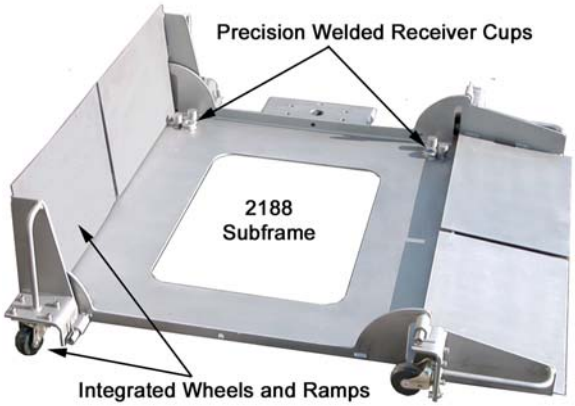
When Mettler Toledo set out to recreate their popular 2888 portable floor scale, they set aside the usual solutions and sought to incorporate new technologies into the design to accomplish three goals: Build a 2888 portable scale that:

- Is more accurate than a standard footed floor scale
- Eliminates as many contamination traps for cleanability as possible
- Is lighter and easier to maneuver for applications where women will often be the primary user of the scale.

Portability and Accuracy


When the scale is in weighing position, the wheels move into cleaning position

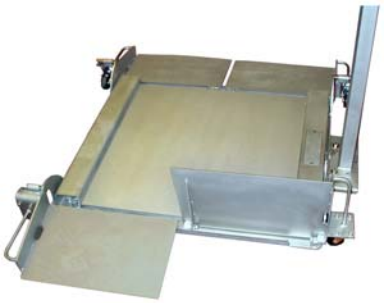
The simple act of moving a scale from one location to another can introduce errors. For accuracy, a scale needs to have precisely aligned load cells to ensure the load is distributed evenly over the sensors. As important, the scale needs to be level when weighing. To achieve both, Mettler Toledo excluded the use of the traditional threaded leveling feet because they are not able to align themselves automatically when the scale is placed in the weighing position. Their choice was a suspension system that eliminates the scale foot completely and is designed to be self-aligning when a load is placed on the scale.



The 2888 design incorporates a rocker pin that rests between the load cell and a receiver cup. When designed and installed correctly, the rocker pin will align itself in a vertical position when a load is applied. If the load is off center on the scale, the rocker pins provide the adjustment to correctly position the load so that it is evenly applied over all four load cells. However, this alignment can only occur when the load cell and the receiver cups are in a precise position when the scale is assembled. To ensure the optimum position of these critical components, Mettler Toledo incorporated fixtures and robotic welders to achieve a tolerance of +/- 1000's of an inch. The result is a "blind hole" loading system that focuses the load at an optimum angle to ensure maximum repeatability and performance by eliminating side and angular loads. Mettler Toledo refers to this design as a Vertex Scale Engine.

Portability and Weight

If it were a stationary scale, the receiver cup could simply be positioned in a sub frame that would allow the scale to remain level when weighing. But since this was a portable scale, it was important to find a way to make the scale portable without using the conventional solution of a portability frame. Otherwise, the scale would have a subframe resting on a portability frame. Plus, it is the portability frame that adds incremental weight to the scale.



Instead, Mettler Toledo took advantage of a common accessory - a ramp – and incorporated it into the design so that the ramp actually served a role in making the scale portable. Ramps on both sides of the scale were split in half. Each half is hinged to the scale's subframe .A bolt-on wheel is attached to the underside of a small extension plate. A built-in handle is welded to the top of the extension plate on one side and on the other it attaches to the ramp. A unique spring-released locking mechanism holds the ramp in either the lowered position for weighing, or a raised position for transporting. Simply pull the lock pin, raise or lower the ramp, and release the pin to lock the ramp in place. The result is a portable scale that has no portability frame. Portability is built right into the 2888 scale itself.

By eliminating the conventional portability frame, Mettler Toledo was able to reduce the weight of the 2888 significantly, making it easier to maneuver. Additionally the split ramp is half the weight of a conventional ramp, making it lighter and easier to raise and lower.

Portability and Cleanability

Because portable floor scales are very popular with pharmaceutical and food preparation companies, ensuring the scale could be cleaned easily was a critical requirement. By eliminating the portability frame, Mettler Toledo eliminated one of the key areas where contaminants are typically trapped. The new integrated portability design also increases access to areas that are traditionally difficult to reach, such as the scale's wheels. When the scale is placed in its weighing position, the wheels are simultaneously placed in a cleaning position.

With the sanitation problem already partially solved, Mettler Toledo completed the task by using design techniques and components that adhere to accepted sanitary design principles. Corners are rounded wherever possible and welds are made smooth to eliminate bacteria traps. Flat headed bolts are used and exposed threads are kept to a minimum.

A laser welded, hermetically sealed, stainless steel load cell was selected to withstand moisture and corrosive environments. They are individually calibrated under controlled environmental conditions from –10C to 40C in a temperature chamber to ensure they will meet Mettler Toledo's performance criteria.

New Generation Portable Floor Scale.
The redesigned 2888 bears little resemblance to the previous version. Threaded stem casters and solid wheel jack assemblies have been replaced by a simple ramp lifting mechanism. The cumbersome portability frame has been completely eliminated making the scale 15% lighter. Bacteria traps have been eliminated and the scale is sanitation-friendly. Finally the technology-advanced Vertex scale engine makes the scale far more accurate than a traditional footed floor scale.

What's next? The Pharmaceutical industry is already pushing for better steel finish specifications aimed at minimizing cross contamination within their plants. Emerging regulations and standards within the food processing and preparation sectors are continuing to push core product design and materials towards better and better solutions for sanitation requirements, including Clean-in-Place (CIP) devices that will require minimal manual cleaning operations, perhaps producing the ultimate solution – the self-cleaning portable floor scale.