



BROMMA

METHOD, RISK AND REGULATION

A CONTAINER WEIGHING INSIGHT

Lars Meurling, Senior Vice President, Bromma, Kista, Sweden

The date for when the Verified Gross Mass (VGM) of an export container has to be available before the container is loaded on a vessel is just weeks away, and we know that a container without VGM will not be loaded onto a vessel.

The challenges for the actors in the supply chain to comply with the requirement are several. One of the biggest is how to establish the VGM. Where to weigh the container another; and what equipment to be used with what requirements on equipment yet another one.

The formal requirements related to accuracy and certification are defined by the local authorities of each country, but it seems like some of the administrations have been caught off-guard and the requirements are set with very little time left for the operators to implement weighing equipment.

This article will elaborate on one of the things that risks being unforeseen by the regulatory authorities when defining the

accuracy requirements: the difference between “equipment accuracy” and accuracy of the actual container weight. It will also look at some of the characteristics of the two main equipment options available to weigh the container in the terminal to establish the VGM. What are the benefits and what are the negatives related to them.

TWO CHOICES

A review of the various technologies available for weighing in a terminal quickly boils down to two main alternatives: weighbridges and load sensing devices fitted to, or integrated into, spreader twistlocks. When reviewing these two technologies, there are a number of characteristics which distinguish them. Different characteristics do not mean that one technology is better or more suitable than the other, but the characteristics will influence the logistical flows and procedures in terminals in different ways.

A weighbridge is the long since established technology which has been used to measure the weight of vehicles. This is the technology that offers the highest ‘equipment accuracy’. But how is the container weight derived, and how does this affect container weight accuracy?

The debate in the industry and the discussions between and within the national regulatory bodies has been focused on the equipment measuring accuracy. However, the aim of the new SOLAS requirement is to measure the container weight accurately enough.

I will for the sake of this article be assuming that no operator will lift the container off the truck and measure the container weight. This means that what will be measured is the weight of the truck, trailer and container combined. In such an instance two options exist to derive the container weight: weigh the empty truck and trailer after the container have been unloaded and then deduct the weight



of the vehicle from the total weight. The other option is to deduct the kerb weight from the total weight to determine the container weight.

If the typical situation in a container terminal is that trucks leave the terminal empty after delivering the container, weighing the empty vehicle on the way out might not be such a big additional step but in many terminals that is not the case. In fact, some countries have programs and directives established to encourage the trucks not to leave the terminal empty. It is therefore assumed that weighing the empty truck will impose an additional step in the logistics flow that many want to avoid. The accuracy of the container weight will however be almost in line with the system accuracy.

When kerb weight is used to calculate the container weight, additional factors will influence the container weight accuracy. Let's for the time being call this the "process inaccuracies". The definition of kerb weight is "the total weight of a vehicle with standard equipment, all necessary operating consumables such as motor oil, transmission oil, coolant, air conditioning refrigerant, and a full tank of fuel, while not loaded with either passengers or cargo".

The definition may differ slightly between nations, and as an example, some

European countries include the driver weight of 75kg.

KERB WEIGHT

Let us now look at three factors in the kerb weight and how it will affect the container weight accuracy. The volume of a typical fuel tank is 500 litres (l). The density of diesel is 0.8kg/l which means that the weight of the fuel in a full tank is 400kg. Since the truck will in some cases arrive in the terminal with a low fuel level the inaccuracy added to the container weight from this factor is actually up to 400kg based on the definition of kerb weight above.

Similarly the weight of the driver will vary. Let's for the sake of this article assume that there is at least one truck driver in a given country who weighs 125kg. Compared to the 75kg European standard driver, this adds another 50kg to the inaccuracy. Lastly, I will assume that some drivers bring extra 'stuff' in their driver cabin (a cooler with some drinks and food, a portable television, etc). These extra things quickly add up and I think that adding 30kg to the inaccuracy is not overstated.

Keep in mind that the definition of accuracy is the worst case scenario, not the average or something else. All measurements made (including process

inaccuracies) must be within the stated accuracy.

Summing these factors up we find that the inaccuracy when kerb weight is used to derive the container weight is +480 kg in addition to the inaccuracy from the weigh bridge itself.

LOAD SENSORS

Load sensors installed in or on twistlocks have the advantage that they measure only the weight of a container. The measure that is obtained is the gross mass of the container without the need to subtract tare weight. The inaccuracy specification for twistlock based systems is typically +/-1%FS (Full Scale) meaning that the measurements are typically within +/-400 kg, i.e. lower than the process inaccuracies in the discussion above.

When two 20 foot containers are loaded on a truck, the weighbridge cannot distinguish between the individual weights of the two containers. A possible procedure for obtaining the individual weight is to unload one of the containers, weigh the vehicle again and then apply the math to achieve the individual weights.

When spreader twistlock based systems are employed, individual TEUs can be weighed as there are sensors in each of the eight twistlocks on a spreader for twin-lifting.



WHAT WILL HAPPEN ON JULY 1?

We have seen different reactions from terminal operators in different countries. Operators in UK are establishing facilities to offer weighing services while, for instance, operators in Los Angeles and Long Beach have jointly stated that they are not capable of providing services meeting the requirement of SOLAS.

The UK and US are two of the countries that have progressed relatively far. I believe there are nations which have still not even defined the requirements for accuracy and certification yet. It is hard to see how those countries can make sure to be fully SOLAS compliant on July 1, 2016. So what will happen when export containers arrive in a port somewhere in the world without a VGM compliant with the new requirements and without weighing equipment in the terminal? The problem with this situation is that SOLAS is a global legal requirement but implementation and enforcement is national. I think we will face a situation in which countries will load containers without a VGM, simply because if they are not loaded the logistics chain will capsize and I do not think the industry and IMO will take it to that level.

ABOUT THE AUTHOR

Lars Meurling is vice-president and marketing director at Bromma, Stockholm, Sweden. He previously served as Bromma's market area manager for Europe, and acting director of Bromma after-sales and services. Prior to joining Bromma, Mr Meurling worked for nearly 20 years in business unit management and sales management in the biotechnology industry. Mr Meurling is a graduate (MSc) in Engineering Physics from Uppsala University in Uppsala, Sweden.

ABOUT THE ORGANISATION

Headquartered in Stockholm, Sweden, Bromma is a world leader in providing crane spreaders. In more than 50 years of continuous operations, Bromma has delivered crane spreaders to 500 terminals in 90 nations on 6 continents. Bromma spreaders are in service today at 97 out of 100 of the world's largest container ports. Bromma is part of the Cargotec organisation.

ENQUIRIES

Mr Lars Meurling
BROMMA, Malaxgatan 7, SE-164 22 Kista, Sweden
Email: Lars.meurling@bromma.com
Tel: +4686200900
Website: www.bromma.com

TAMTRON
MODERN WEIGHING

Meet the
SOLAS requirements
with tested and approved
**TAMTRON POWER
SCALES**
for container stackers
& straddle carriers



WEIGH CONTAINERS ACCURATELY WITHIN NORMAL WORKFLOW

- ▶ Fast and easy to install, retrofit and service
- ▶ Combine container ID with VGM
- ▶ Transfer weighing information to operational use real-time through cloud service or integration into TOS
- ▶ Collect weighing information into the same information management infrastructure from all of the Tamtron scales used at the seaport, e.g. container stacker scales, straddle carrier scales as well as from traditional weighbridges

MEET US AT TOC EUROPE 2016 STAND A46

TAMTRON
tel. +358 3 3143 5000
weighing@tamtron.fi

WWW.TAMTRONGROUP.COM