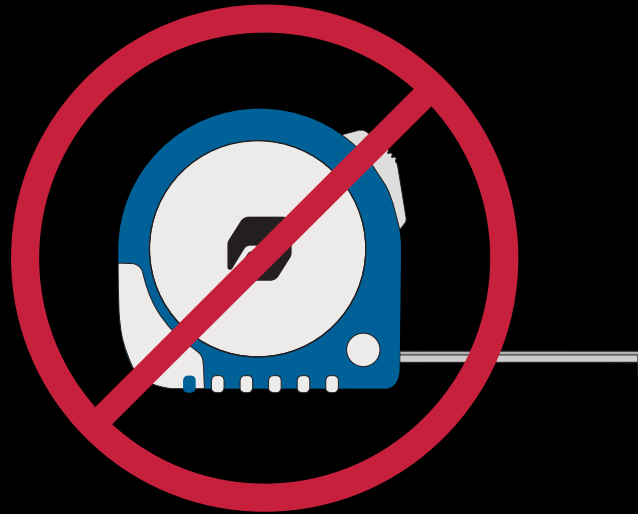


METROLOGY: THE BEDROCK OF DIMENSIONING TECHNOLOGY



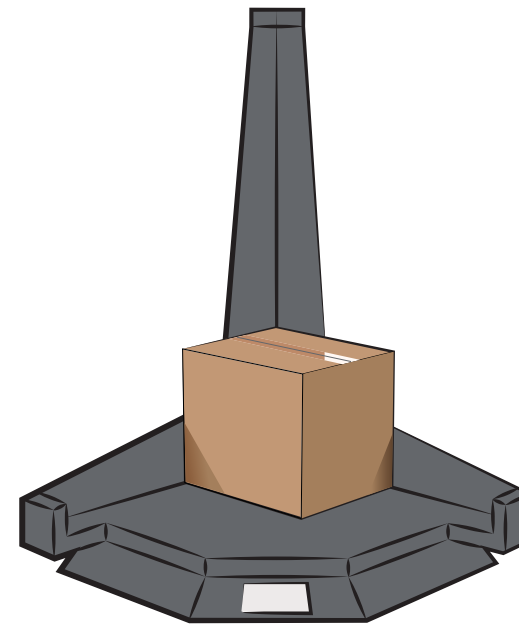
Metrology is the scientific study of measurement. Occasionally, it's referred to as measuring measurement. Metrology isn't talked about often and is overlooked. When metrology applications are successful, that success goes unnoticed because most of us have become accustomed to these applications consistently working properly. Whenever you go to a gas pump to put fuel in your car or go to a deli to get some meat, you're interacting directly with metrology.

Metrology is the bedrock of dimensioning systems. As technology such as dimensioning systems improves, our understanding of metrology also improves. Better technology provides more accurate measurements and measurements are crucial in our e-commerce dominated world.

In this white paper, we're going to provide information about what metrology is, explain why it matters, its role in dimensioning, how it touches so many areas of the shipping process, and serves as a guide for companies such as Cubiscan as we continue to develop our products and technology.

METROLOGY DEVICES

Certain devices are essential for warehousing and distribution operations. The three most crucial pieces of information that are needed for these operations are the dimensions, weight, and identification of the SKUs. In order to marry those three things together, you need a multiple dimension measuring device (MDMD) along with a scale and a barcode reader. MDMDs are often referred to as dimensioning systems. Warehouse employees use most of these devices daily.



WHY DOES METROLOGY MATTER FOR DIMENSIONING

Advancements and innovations to technology such as [dimensioning systems](#) have opened new doors for metrology and changed the way we think about collecting measurements. In the past, knowing the dimensions and weight of large boxes was the main objective of most companies. Most items were shipped from a warehouse to a brick-and-mortar store. Getting those items from the warehouse to the store was the only planning involved. Since that time, e-commerce popularity has exploded. Consumers can now have items shipped directly to their front door. This means more trucks, boxes, and packing materials are needed. As we become more efficient, boxes will get smaller, more boxes will fit on a truck, and fuel consumption will be optimized as fewer trucks are required to move more product. Having a deep understanding of metrology helps make every phase of the shipping process more efficient.



QUESTIONS YOU SHOULD ASK

When searching for a dimensioning system, you should ask about the limitations of devices, what certifications the device has, and what type of testing the device has gone through. It's important to ask these types of questions because there isn't a one-size-fits-all solution when it comes to measurements and dimensioning.

CERTIFICATIONS

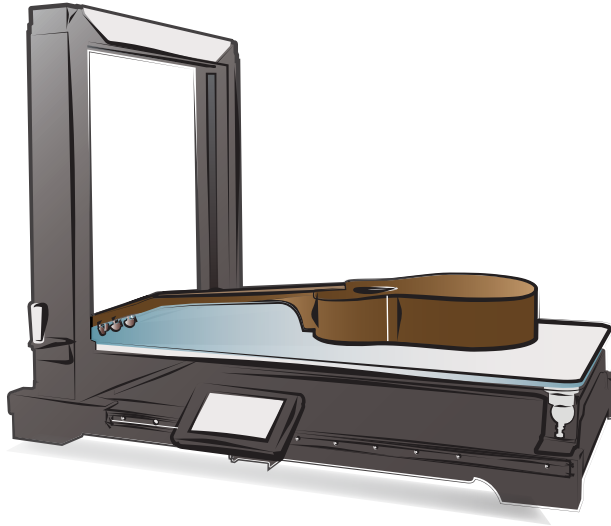
There are several types of certifications you should look for when shopping for a dimensioning system. One is a Legal-for-Trade (LFT) certificate. In some areas of the world, this is required if you are using equipment to directly charge a customer. An LFT certificate isn't always required but if you intend to charge customers with them present, it is a requirement. Along with LFT certifications, it's always a good idea to look for safety certifications.

TESTING AND CALIBRATION

For a measurement device to function properly and consistently, it must undergo rigorous testing. It's one thing for a device to work one time but a completely different thing for that device to work properly hundreds of times per day. Extensive testing must be done on a dimensioning system's hardware and software components before it is ready to use in a warehouse or distribution center. The last thing you want is a dimensioner that can't consistently and reliably provide correct measurements.

LIMITATIONS AND CHALLENGES

When it comes to dimensioning products, many people want to purchase one device that can do everything. This simply isn't realistic. You wouldn't want to purchase a pallet dimensioner to measure a screwdriver. A pallet dimensioner's measurement increment is too big to handle such a small item. Dealing with +/- 1 inch accuracy on an item that's only 5 inches long to begin with is a recipe for inaccurate and ugly data. Not to mention, pallet dimensioners are designed to measure items in full inches or fractional feet, not tenths of inches. Maybe I'm off in left field, but I'm guessing you don't want to know how many feet that screwdriver measures. On the flip side, small dimensioning systems designed for parcels are not big enough to measure a large pallet.



It's also important to know that various systems use various technologies to measure items. There currently isn't a single piece of technology that will effectively measure any item. For example, ultrasound-based systems are not capable of measuring an item such as a foam football. The foam would absorb the soundwaves so nothing would bounce back to the sensors to produce the dimensional data. If you're using a system that uses a type of light technology or laser technology, the materials can't be transparent or highly reflective. Camera-based systems struggle with items that are wrapped in black plastic or have protrusions.

In most cases, most technology will do well with most things but there are always exceptions that you should ask about as you learn about a product. Make sure you are getting a dimensioner that can handle the types of items you need to measure.

Arguably the biggest challenge to any dimensioning system is "shape-shifting" items such as apparel. Since apparel doesn't have ridged edges like a parcel or a spatula for example, its measurements can vary significantly each time it's dimensioned. That's no fault of the dimensioning system, it's just the nature of the item being measured. The best way to measure these items is to fold or place them on the dimensioning system in the same way you would fold or place them into their packaging. This may take a little extra training for those operating your dimensioning systems, but it will pay big dividends in the long run. Clean and accurate dimensional data will improve all of your warehousing and distribution efforts.

SIGNS OF SUCCESS

Successful application of metrology often goes unnoticed and that's a sign of success. When you go to the gas station to put 10 gallons of gas in your car, you're confident that the pump will dispense exactly 10 gallons of gas. What most people don't realize is that for that pump to be effective a lot of science and work went into it. Someone had to calibrate it to dispense 10 gallons when the meter said 10 gallons, and someone had to put it through a series of tests to make sure it would be consistent.

The same can be said for dimensioning systems and scales. Huge effort goes into engineering, testing, and developing the products to make sure that when they are used, the data can be relied upon to make decisions.



CONSEQUENCES OF POOR MEASUREMENT

There are some negative consequences if a measuring device such as a dimensioning system is providing poor measurements. One issue that could occur is an item won't fit in its storage location. Some automated devices rely heavily upon accurate dimensions. If an item doesn't fit on a shelf or in a bin, it leads to employees not sure of what to do and causes inefficiencies throughout the rest of the warehouse.

Efficient warehousing processes are a central component of e-commerce and logistics operations. When poor measurements cause something to not fit in its designated storage area, it can have a compounding effect that spreads into the rest of the operation. It can cause longer lead times and issues with transportation such as not having enough space on a truck. If either of those issues occur, it has a negative impact on the customer experience. Without customers, your business can't survive.

WHAT DOES THE FUTURE HOLD?

Understanding more about metrology requires technological advancements. As technology becomes more efficient and accurate, we can measure things in new and innovative ways which allows us to expand our knowledge of metrology. Here at Cubiscan, we have a dedicated team of engineers who are constantly expanding their knowledge of metrology. They use that knowledge to develop our products and push the capabilities of dimensioning systems, providing you with a better, more accurate, and more reliable measurement device. [Reach out to us](#) to learn more about dimensioning systems and how they can help your operation perform well for years to come.