Background:

FOOT MASTER® features an ingenious concept of functional product combining the mobility of a caster, the adjustability of a level mount, and the stability of a foot pad. As a result of this remarkable innovation, the GD Series is leading the global market with thousands of companies utilizing these leveling casters to improve operations, efficiency and safety.

NSF certification directly impacts the food equipment and food service industries by allowing companies to experience the same benefits, resulting in better product development for a more capable work environment.

This paper aims to make a case by addressing issues 2354987-6 and 2354897-7 brought forth in the Physical Evaluation Report for NSF/ANSI 2-2018 referenced as 2354987 citing §5.23.5 (2354987-6) and §5.23.6 (2354897-7) as the standards related to the issues. Since the evaluation in May of 2019, NSF/ANSI 2-2019: Food Equipment was released in December 2019, with no revisions related to the above mentioned standards.

As the purpose behind standards §5.23.5 and §5.23.6 are associated with the general sanitation of casters, we share the goal: to prevent the harborage of vermin and the accumulation of dirt and debris, and to permit the inspection, maintenance, servicing, and cleaning of the equipment and its components. We propose one solution that will address the issues together and ask the Committee to consider our recommendation.
2354987-6

Casters - Horn to wheel distance

Moving a piece of food equipment into the desired location, applying a typical wheel braking mechanism, and setting the unit in the exact position is easier said than done with standard caster applications. FOOT MASTER® leveling casters offer a smart solution. Once positioned in the exact spot of operation, the anti-vibration pad is lowered and the caster wheel is lifted off the ground, making the equipment completely stationary.

The GD Series leveling caster utilizes a solid shaft that is machined with a square end to prevent rotation and loosening. The horn legs are intentionally engineered to cradle the ends of the shaft, thus supporting the wheel. As a result, the frame has horn legs wider than 1” to accommodate the required length of the shaft ends, allowing the ends to carry the entire load. Weight capacity and stability is further maximized by using tight tolerances between the sides of the wheel and the horn legs.

§5.23.5 Reference

If the closest surface of the horn leg parallel to the wheel side is 1.0 in wide (25 mm) or less, a minimum clearance of ⅛ in (0.13 in, 3.2 mm) shall be provided between the sides of the wheels and the horn legs. If the surface is greater than 1.0 in (25 mm) wide, a minimum ¼ in (0.25 in, 6.4 mm) clearance shall be provided.

The GD Series leveling caster is used primarily as a leveler and stabilizer in kitchen environments. For a large majority of the time spent in operation, a FOOT MASTER® leveling caster is positioned with the foot pad engaged. Which means that the wheel is not in constant contact with the ground.

With this in mind, our unique product utilizes a wheel that is easy to remove for cleaning, sanitizing, inspecting and servicing. Therefore, it is less susceptible to the elements found in kitchen environments that affect standard casters exempt to clearance requirement §5.23.5. Finally, with the GD Series leveling caster, it is easier to maintain the high standards of cleanliness for which §5.23.5 was established.
Casters - Wheel tread to horn distance

The GD Series leveling caster profile is integral to its function. A thick aluminum frame is used to achieve the combination of being both strong and lightweight. It is designed to be compact, yet have incredible load capacity. To achieve this goal, the leveling caster has a hood with greater than a 90° angle. This is necessary for structural integrity.

FOOT MASTER® invented the leveling caster and set the standard for performance, capability and dependability. As the leader in design and functionality, the configuration of the GD Series leveling caster has proven itself to be the most optimal shape. This design has dominated the market, and since the patent expired, has served as a blueprint for competitors.

§5.23.6 Reference
A minimum clearance of ¼ in (0.25 in, 6.4 mm) shall be provided between the wheel tread and horn assembly. For swivel casters, the minimum clearance shall be 1/8 in (0.13 in, 3.2 mm). Hooded horns with more than a 90° arc of the wheel covered shall not be used.

Typical casters with braking mechanisms can be hazardous, as the component and/or lever can protrude beyond the profile of the caster itself. For the same reason, these locking devices are highly susceptible to dust, dirt and fluids. However, in an effort to provide the food equipment/service industry with the convenience of mobility to immovability, these are exempt from clearance requirement §5.23.6 established for cleanliness.

GD Series leveling casters can accomplish the same goal with no protruding parts, removing any potential hazard and mitigating the accumulation of filthy substances.

Recommendation:
Recommendation

The foot element, or foot pad, of the GD Series leveling caster functions as the most reliable brake possible, as the wheel cannot make contact with the ground when the foot is engaged. Since the leveling caster acts as a brake, we propose that it be treated as such. We recommend granting leveling casters the same exemptions given to brakes and other locking devices.

§5.23.8 ANSI Standard

**Brakes and other locking devices are exempt from the caster clearance requirements in Sections 5.23.5 and 5.23.6.**

§5.23.8 Recommendation

**Brakes, and other locking devices, and leveling foot pads are exempt from the caster clearance requirements in Sections 5.23.5 and 5.23.6.**
If not provided electronically, the submitter will be responsible to have sufficient copies to distribute to committee members.
FOOT MASTER® Leveling Casters
The Accomplishment of Perfect Product & Company + The Original Leveling Caster

MOBILITY
Casters and wheels attached to the bottom of an object create several advantages such as transporting items & materials efficiently, moving or relocating equipment with ease, and faster deployment of devices and machines.

ADJUSTABILITY
Levelers and level mounts can make an object adaptable to uneven floors providing a flat, level surface along a horizontal plane, which delivers optimum balance and achieves accurate calibration.

STABILITY
Foot pads offer expanded capabilities, including anti-vibration protection, shock absorption, flexibility to changing loads, and a firm hold to the ground making equipment completely stationary.

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FOOT MASTER® Leveling Casters
GD Series Product Line Handles Various Loads + Various Sizes

FOOT MASTER® Leveling Casters
Numerous Mounting Options Offered + Available Custom Configurations

GLOBAL METRICATION MAP

Metric  Standard  Mixed

STANDARD VS METRIC

Most countries use the metric system (SI) as their official system of weights and measures. Led by engineers, global manufacturing companies have converted because the system is precise and decimal-based, while the US has adhered to the standard system.

GLOBAL MARKET DEMAND

FOOT MASTER® believes that meeting the needs of a global market starts with a focus on serving customers and solving problems. GD Series leveling casters can be outfitted with a wide array of mounting options for standard and metric applications. This flexibility creates new capabilities for the food services industry.

MOUNTING VERSATILITY
FOOT MASTER® Leveling Casters
Application Specific Wheel + Foot Pad Selections Enable Adaptability

FOOT MASTER® Leveling Casters
Stainless Steel is The Most Common Material Used in Commercial Kitchens

- CORROSION RESISTANT
  Metal has the capacity to hold binding energy and withstand deterioration and chemical breakdown.

- HEAT RESISTANT
  Properties can sustain temperatures as low as 14°F, making it ideal for freezers, and as high as 194°F, fitting for kitchen environments.

- HYGIENIC
  A non-porous metal, it possesses a resistance to pitting and does not support the growth of bacteria and pathogens. The quality surface is easy to clean & sanitize.

- ENVIRONMENTALLY FRIENDLY
  It is 100% reusable and recyclable, as well as neutral to food and beverage items.
FOOT MASTER® Leveling Casters
An Endless Palette of Color Options to Promote Creativity & Customization

FOOT MASTER® Leveling Casters
Anatomy of the ORIGINAL Leveling Caster + The Standard for Performance

- Steel Top Plate
- Heat Treated Raceway
- Aluminum Diecast Frame
- ABS Thumb Adjuster
- Anti-Vibration Axle
- NBR Rubber Foot Pad
- Nylon 66 Wheel
FOOT MASTER® Leveling Casters
Diligent To Protect People and The Environment

ROHS COMPLIANT
Restricted materials are hazardous to the environment and pollute landfills, and are dangerous in terms of occupational exposure during manufacturing and recycling.

REACH COMPLIANT
Chemical substances can have a potential negative impact on human health and the environment, and can pose significant risks with devastating effects.

ISO 9001:2015 CERTIFIED
The standard is based on 7 quality management principles, which include strong customer focus, the involvement of top management, and a drive for continual improvement.
FOOT MASTER® Leveling Casters

"Solving an issue requires nothing less than running to the problem." - Unknown

ISSUE 2354987-6: Casters - Horn to wheel distance
The caster does not meet the clearance requirements. The horn leg is greater than 1 inch wide and there is less than 1/8" of clearance.

NSF/ANSI 2 - 2019: §5.43.5 Reference
If the closest surface of the horn leg parallel to the wheel side is 1/2 in wide (25 mm) or less, a minimum clearance of 1/8 in (0.13 in, 3.2 mm) shall be provided between the sides of the wheel and the horn legs. If the surface is greater than 1/2 in (25 mm) wide, a minimum 1/4 in (0.25 in, 6.4 mm) clearance shall be provided.

EASE OF CLEANING: CASTERS BORN THROUGH INNOVATION
GD Series leveling casters are predominately utilized as a leveling and stabilizer. In this position the wheel is not in contact with the floor surface. These products feature a unique design, a removable wheel that allows for cleaning and sanitizing with ease.

FOOT MASTER® Leveling Casters

Fusing Imagination with Ambition to Proactively Solve Problems

INNOVATION
GD Series leveling casters were designed to empower, engineered with pride, and manufactured to perform. This innovation presents valuable solutions that serve our customers.

STRENGTH
Solid shaft enables increased load capacity and ease of movement.

SUPPORT
Vertical area prevents the shaft ends from coming into contact with the floor.

ACCESSIBLE
Small moveable ball wheel makes for easy cleaning and inspection.

PRECISION
Precision-machined socket to prevent rotation and loosening.

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FOOT MASTER® Leveling Casters

"The function of design is letting design function." - Michio Commeren

ISSUE 2354987-7: Casters - Wheel tread to horn distance
The caster does not meet the improvement requirements. The horn leg is greater than 1 inch wide and there is less than 10° of clearance.

NSF/ANSI 2 - 2019: §5.23.6 Reference
A minimum clearance of ¼ in (6.4 mm) shall be provided between the wheel tread and horn assembly. For swivel casters, the minimum clearance shall be 1/8 in (0.3 mm). Hooded horns with more than a 90° arc of the wheel covered shall not be used.

STRUCTURE COMPARISON: CASTERS BUILT TO FUNCTION
FOOT MASTER® invented the leveling caster by introducing the GD Series, thus establishing the structural benchmark for functional capability and dependability. These leveling casters not only offer superior braking ability, but compete favorably in regard to cleanliness, when compared to its caster counterparts equipped with external brakes and locking devices.

FOOT MASTER® Leveling Casters
GD Series Market Domination Incites Competitors To Copy Optimal Design

"It is better to fail in originality than to succeed in imitation."
- Herman Melville

"Do something wonderful, people may imitate it."
- Albert Schweitzer
FOOT MASTER® Leveling Casters
The Most Reliable Brake Possible

FOOT MASTER® Series Leveling Casters
Highly restricts movement

A caster equipped with a brake still allows some movement!

Recommendation:
Brakes and other locking devices, and leveling foot pads are exempt from the caster clearance requirements in Sections 2.25.5 and 2.25.6.

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**Please submit to**: Al Rose, arose@nsf.org

*Type written name will suffice as signature*

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