

Interpretation: 1-78

Subject: ANSI/ITSDF B56.1-2005, Section 4.2.3, Modifications, Nameplates, Markings, and Capacity and Section 7.5.9, Nameplates and Markings

Date Issued: March 13, 2006

Question (1): Section 4.2.3 states that “If a truck is equipped with front end attachments...”, does this include an attachment that is provided with the fork truck by the manufacturer?

Answer (1): Yes.

Question (2): Would this attachment be an attachment other than the standard equipped tines?

Answer (2): Yes. Forks are not considered to be an attachment.

Question (3): If an off the shelf attachment is purchased to use on the standard tines and the fork lift manufacturer says that the attachment purchased will not affect the capacity or the safe operation of the truck, does the fork truck require a second nameplate?

Answer (3): Another nameplate would not be required if it does not affect capacity, stability, or safe operation.

Question (4): Is section 7.5.9 referring to removable attachments, does the fork truck require a nameplate if the attachment does not affect the capacity or the safe operation of the truck?

Answer (4): Removable attachments that do not affect capacity, stability, or safe operation do not require a nameplate.

Interpretation: 1-79

Subject: ANSI/ITSDF B56.1-2005, Section 7.37.1 (g), Platforms: Elevating

Date Issued: March 18, 2006

Question (1): Section 7.37.1 (g) refers to a safety factor of 3 to 1 on the minimum yield strength of materials used for all load supporting structural elements and platform attachment means. Does this refer to the forks or does it include the overhead guard if workers are attaching to it via self-retracting lifeline?

Answer (1): Section 7.37 is about elevating platform type of trucks with elevated operators. The 3:1 safety factor in (g) would apply to all elements of the truck design that would support the load while the forks and platform are elevated. It would include the forks, the part of the platform that supports the forks, the part of the structure that supports the platform, (cylinders, mast rollers and mast beams that hold the load up). The overhead guard

is not part of the load supporting structure and therefore would not have the 3:1 requirement. The overhead guard is for falling objects protection and has strength requirements as stated in section 7.29. The dynamic test requirements for testing the overhead guard would exceed the dynamic requirements for testing of the operators fall protection as stated in section 7.37.1 (d) 2 (f). Therefore, the 3:1 strength requirement is not the determining strength factor for either the overhead guard or the tether attachment point.

Interpretation: 1-80

Subject: ANSI/ITSDF B56.1-2005, Section 4.2.3, Modifications, Nameplates, Markings, and Capacity and Section 7.5.9, Nameplates and Markings

Date Issued: May 12, 2006

Question (1): Why must the truck have twice the capacity needed to lift the work platform?

Answer (1): Rational statements are not included in the B56 Standards and record retention policies do not provide access to meeting minutes of the earlier discussions of elevated platform requirements. The present language reflects the coordinated experience of the Committee members as well as those reflected in State Codes standard development bodies. Suggested improvements in the applicable values will be considered so long as they add to the Committee's safety objectives without impairing the vehicle utility. The Committee's overall experience with the present requirements does not indicate a deficiency in elevated platforms built to B56.1 requirements.

Question (2): Would a truck that has a capacity rating of 4000 lbs. with the center of the load (c.g.) at a distance of 24 in. along its forks meet the ANSI/ITSDF B56.1-2005 requirements to lift a fully loaded work platform that weighs 2000 lbs. but has its c.g. at a distance of 36 in. along the forks (one foot further away from the truck) since the truck capacity rating is twice the fully loaded weight of the work platform?

Answer (2): No. Capacity is not just the weight to be carried, but also involves the load center. The capacity of the truck at a 36 inch load center would be less than 4000 pounds. The truck manufacturer needs to be contacted to determine the capacity and to obtain a new rating.

Interpretation: 1-81

Subject: ANSI/ITSDF B56.1-2005, Section 7.5, Nameplates and Markings

Date Issued: December 15, 2006

- Question (1): Are fork tines considered to be an attachment?
- Answer (1): No. In Part IV, Glossary of Commonly Used Words and Phrases, the definition of attachment is given and states, in part, that an attachment is a device other than conventional forks.
- Question (2): Is the length of the fork tines required to be annotated on the nameplate?
- Answer (2): No, but as stated in section 7.27 each fork shall be clearly stamped with its individual load rating. Consult your operator manuals and ANSI/ITSDF B56.1 for additional instructions on capacity and handling loads properly.

Interpretation: 1-82

Subject: ANSI/ITSDF B56.1-2005, Section 5.4.5, Loading

Date Issued: April 4, 2007

- Question (1): If a chain attached to a high lift industrial truck is used to pull a pallet from a rack and while being pulled the chain partially elevates the pallet, is it considered a suspended load as in section 5.4.5.
- Answer (1): As stated in section 5.4.5, a load should never be dragged horizontally. If the load was being lifted with a chain vertically using a crane boom or other device, the load would be considered a suspended load as soon as the load can introduce dynamic forces.

Interpretation: 1-83

Subject: ANSI/ITSDF B56.1-2005, Section 7.29.2(4) and 7.29.2(5), Test Procedures (Overhead Guard)

Date Issued: October 9, 2007

- Question (1): Section 7.29.2(4) requires the permanent deformation of the overhead guard and its mounting after impact to be measured between a horizontal plane tangent to the underside of the guard at the operator's position and a horizontal plane tangent to the upper surface of the steering wheel. From what point is this measurement to be taken if there is no steering wheel?
- Answer (1): The intent of the wording in the standard is to ensure an operator has enough room to escape entrapment in the event an overhead guard is deformed to the maximum allowable extent. At one time, all sit down rider controlled trucks were steered with a steering wheel and the steering wheel was typically that part of the truck most likely to prevent further movement away from the overhead guard during this type of deformation of the overhead guard. Steering technology that does not

include the use of a steering wheel is not addressed by the standard currently.

Interpretation: 1-84

Subject: ANSI/ITSDF B56.1-2005, Section 7.39, Fork Extensions

Date Issued: December 19, 2008

Question (1): Are products such as drum grippers, trailer spotters, and multiple pipe lifters that attach with fork pockets to existing truck forks considered fork extensions?

Answer (1): No. The glossary (Part IV) defines a fork extension as a lift truck attachment that is added to the truck fork to increase the fork's effective length for handling oversized uniformly distributed loads.

Fork extensions fit over the existing forks, maintain the approximate shape of the forks, extend their length, and are not part of another device or object.

Question (2): Are there specific requirements or calculation formulas that are required for design factor, size, and rating the rated load center for other attachments such as booms, fork beams, and rug ram extensions?

Answer (2): The B56.1 standard applies to industrial trucks. With the exception of fork extensions, design requirements for attachments are not addressed in the standard.

Interpretation: 1-85

Subject: ANSI/ITSDF B56.1-2005, Section 6.2.8 (a), Inspection and repair of Forks in Service on Fork Lift Trucks; Section 6.2.8.1 Inspection; and Section 6.2.8.1 (a) Surface Cracks

Date Issued: March 27, 2009

Question (1): Section 6.2.8 requires forks to be "inspected at intervals of not more than 12 months." What comprises details of the referenced annual inspection?

Answer (1): The checks to be performed and the criteria for acceptance are found in 6.2.8.1.

Question (2): Section 6.2.8.1 requires detection of "any damage, failure, deformation, etc., which might impair safe use." What procedure is used for that?

Answer (2): The procedure to use is not detailed in the standard, but the checks to be performed are in Section 6.2.8.1 (a) – 6.2.8.1 (g).

Question (3): Is a nondestructive test required as part of a 12 month annual inspection due to the fact that a visual inspection will not reveal cracks?

Answer (3): A nondestructive crack detection process is only needed if considered necessary.

Interpretation: 1-86

Subject: ANSI/ITSDF B56.1-2009, Sections 4.17.3 (l) and (n), Elevating Personnel

Date Issued: May 7, 2010

Question (1): ITSDF B56.1-2009, section 4.17.3 (l) states “Move truck and/or platform slowly, only for minor adjustments in horizontal positioning when personnel are on the platform, and only at their request.”

Does this allow the forklift to be moved (e.g. driven forward and reverse direction) while the platform is raised and occupied with personnel?

Answer (1): No. Section 4.17.3 (g) states “Place all travel controls in neutral and set parking brake.” Maneuvering or traveling of the truck with personnel on a work platform is not permitted.

The intent of the wording of 4.17.4 (l) is to allow slight movement of the platform only through the use of load handling controls such as lift, lower, tilt, and pantograph or boom extension, if applicable.

Question (2): While personnel occupy a raised platform, is the forklift operator able to do other work duties (e.g. doing carpentry), while remaining within 25 feet of the forklift and maintaining the forklift in view?

Answer (2): No. Section 5.2.12 a (4) requires an operator to lower the load-engaging means fully, unless supporting an elevated platform, before leaving the operator’s position. The section does not refer to elevated *work* platforms, thus an operator must fully lower an elevated work platform when leaving the operator position. Note that fully lowering the work platform when the operator leaves the operating position also conforms with OSHA 1910.178.

Interpretation: 1-87

Subject: ANSI/ITSDF B56.1-2009, Sections 6.2.11 Repair and Testing

Date Issued: July 23, 2010

Question (1): The standard states that hydraulic components “shall be checked to ensure that drift or leakage has not developed to the extent that it would

create a hazard.” To what extent would drift have to be developed to be considered a hazard?

Answer (1): It is not possible for the standard to list all possible hazards that may exist from drift or leakage of tilt cylinders, valves or other parts. In general, more frequent repositioning of the load will be required if the drift becomes too great and the user should consider the impact this may have. The industrial truck manufacturer may be able to provide additional guidance.

Interpretation: 1-88

Subject: ANSI/ITSDF B56.1-2009, Section 7.39.2 Fork Extensions

Date Issued: September 30, 2010

Question (1): ITSDF B56.1-2009, section 7.39.2 states “Each fork extension shall be capable of supporting a uniformly distributed, or equivalent load of three times its rated capacity when mounted on a fork of the specified size.”

What is the maximum length the load can be?

Answer (1): ANSI/ITSDF B56.1-2009 does not directly address the length of the load when using fork extensions. 7.39.3 states the rated load center of the fork extension should be at 50% of the fork extension load supporting length. For a uniform load, this would mean that the length of the fork extension and the length of the load would be equal. For a nonuniform load, however, it is possible for the length of the load to extend beyond the end of the fork extensions and still have the load center at 50% of the supporting length

Interpretation: 1-89

Subject: ANSI/ITSDF B56.1-2009, Section 5.2.3 General

Date Issued: March 5, 2012

Question (1): Paragraph 5.2.3 states “Do not start or operate the truck, any of its functions or attachments, from any place other than from the normal operator’s position.” Is there any section of B56.1-2009 that requires the manufacturer of the powered industrial low lift or high lift truck to make the truck hydraulic functions inoperable unless the operator is in his normal operator position either standing or seated? Or, does this only pertain to the truck operator?

Answer (1): No, in ANSI/ITSDF B56.1-2009 there is no manufacturer requirement to make the truck hydraulic functions inoperable unless the operator is in his normal operator position.

Interpretation: 1-90

Subject: ANSI/ITSDF B56.1-2009, Section 7.25.7 Load-Handling Controls

Date Issued: May 24, 2012

Question (1): Does 7.25.7 apply if a forklift had a clamp installed on it before October 7, 2010?

Answer (1): No, the requirements of B56.1-2009 became effective 7 October 2010 and only apply to trucks manufactured after 7 October 2010.

Question (2): Does 7.25.7 apply if a forklift was manufactured before October 7, 2010 and a clamp was installed after October 7, 2010?

Answer (2): No, the standard became effective on 7 October 2010. A truck manufactured before 7 October 2010 would not be subject to the requirements that became effective on that date.

Interpretation: 1-91

Subject: ANSI/ITSDF B56.1-2009, Section 7.20.2 Travel Controls: Electric Trucks, Stand-Up Rider

Date Issued: May 24, 2012

Question (1): What is the definition of the term “travel circuit”? Does this only refer to the drive motors? Or, does this apply to the power steering, too?

Answer (1): There is no definition of travel circuit. The intent of the paragraph is to specify a design requirement of the travel control system to remove power to the drive motors automatically when the operator leaves the operating position. Power steering is not addressed in this requirement.

Interpretation: 1-92

Subject: ANSI/ITSDF B56.1-2012, Section 7.5.2 Nameplates and Marking

Date Issued: November 14, 2012

Question (1): What is the definition of “durable” as used? What materials would be examples of a durable nameplate? What is the definition of “install” as used? Is a specific mounting method or location required?

Answer (1): The intent of the requirements is for the required information to remain fixed to the truck in a manner that would, under most circumstances, be permanent considering typical intended application and use. A specific mounting method or location is not addressed by the standard.

Interpretation: 1-93

Subject: ANSI/ITSDF B56.1-2012, Section 4.17.2 Table 1 Personal Fall Protection System Configuration

Date Issued: December 18, 2012

Question (1): Table 1 Personal Fall Protection System Configurations shown in ANSI B56.1-2012 specifies the types of personal fall protection required whenever the truck is used to elevate personnel. When this revision of B56.1 becomes effective on February 23, 2013, will this be applicable regardless of whether the truck was manufactured before or after the effective date or only for trucks manufactured on or after the effective date? Or, since this applies to the user and not the manufacturer, is the truck manufacturing date not at all applicable?

Answer (1): Compliance with paragraph 4.17.2 (c) and Table I, contained in Part II For the User, does not depend upon the date of manufacture of the truck.

Interpretation: 1-94

Subject: ANSI/ITSDF B56.1-2012, Section 7.29, Overhead Guards for High Lift Rider Powered Industrial Trucks

Date Issued: March 4, 2013

Question (1): Section 7.29.1(e) requires a vertical clearance of at least 890 mm for sit-down riders. Section 7.29.1(h) allows for an exception to this requirement when the user requests a reduce height overhead guard to permit operation in areas where obstructions limit the overall lowered height of the truck. Section 7.29.2(c)(4) requires a clearance of 765 mm between the Seat Index Point of the truck and a horizontal plane tangent to the underside of the guard be maintained after the impact test. Does the 765 mm minimum requirement, as specified in section 7.29.2(c)(4), still apply to reduce height overhead guards that are supplied per section 7.29.1(h)?

Answer (1): Yes.

Interpretation: 1-95

Subject: ANSI/ITSDF B56.1-2012, Section 4.5.1.1, Overhead Guards

Date Issued: January 23, 2014

Question (1): Section 4.5.1.1, states “High lift rider trucks, including order picker trucks, shall be fitted with an overhead guard manufactured in accordance with para. 7.29”.

Does this requirement also apply to low lift order picker trucks?

Answer (1): No. The paragraph means that overhead guards shall be fitted to high lift rider trucks and high lift order picker trucks. From the glossary, a low lift order picker truck is one that neither the load-carrying surface nor the operators platform elevate more than 1 200 mm.

Interpretation: 1-96

Subject: ANSI/ITSDF B56.1-2012, Section 7.15.2 Steering Requirements

Date Issued: June 8, 2015

Question (1): Paragraph 7.15.2 requires a means to protect the operator’s hand against injury from contact with doors, wall, columns and rack for motorized hand/rider trucks employing tongue steering.

Is protection for operator’s hands required to provide protection during operation in both the forks-leading direction and the forks-trailing direction and when the steering tongue is being turned, or is protection when operating in just the most common direction adequate to conform with the standard?

Answer (1): This is not addressed by the standard.

Question (2): Is operator training and/or use of warning, danger, caution, and other instruction labels adequate to provide the protection required by the standard?

Answer (2): The actual means to provide protection for the operator’s hand against injury from items such as doors, wall, columns, and racks is not specified.

Question (3): Is it required that motorized hand/rider truck employing tongue steering be designed and manufactured such that the truck is rendered inoperable when physical guards providing protection for the operator’s hands are removed?

Answer (3): No, but in accordance with 4.2.1 of B56.1-2012 removal of such a guard is a modification of equipment and requires manufacturer approval.

Interpretation: 1-97

Subject: ANSI/ITSDF B56.1-2012, Section 7.29.1 Overhead Guard for High Lift Rider Powered Industrial Trucks Design Requirements

Date Issued: June 8, 2015

Question (1): Paragraph

Question (1): Section 7.29.1 states that when requested by the user, the manufacturer may reduce the normal overhead guard height to “permit truck operation by the user with a guard in areas where overhead obstructions limit the overall lowered height of the truck.”

Does the overall lowered height of the truck refer to the top of the mast?

Answer (1): The overall lowered height of the truck refers to the height of the tallest component of the truck once the forks have been lowered to their lowest point. It is possible for the mast to be the tallest component but it could be another part of the truck such as a hose reel or a part of the overhead guard.

Question (2): If yes, is it possible to have an overhead guard that is lower than the top of the mast, as long as it still meets the overhead guard impact deformation limit of 765 mm minimum?

Answer (2): An overhead guard can be lower than the mast. The design requirements of 7.29.1 and the test procedures in 7.29.2 apply to all overhead guards for high lift rider powered industrial trucks.

Interpretation: 1-98

Subject: ANSI/ITSDF B56.1-2012, Section 7.39.2, 4, 5 Fork Extensions

Date Issued: August 28, 2015

Question (1): ANSI/ITSDF B56.1-2012, Section 7.39.5 states “Lateral clearance shall not exceed 12 mm between fork and extension.”

Is the 12 mm clearance to be determined (a) as if the fork was centered within the extension and there is 12 mm on both sides of the fork or is the 12 mm clearance to be determined (b) as if the fork is in any position within the extension and the combined two distances on both sides of the fork totals 12 mm?

Answer (1): There should be no more than a total of 12 mm clearance between the fork and fork extension.

Question (2): ANSI/ITSDF B56.1-2012, Section 7.39.2 states “Each fork extension shall be capable of supporting a uniformly distributed, or equivalent load

of three times its rated capacity when mounted on a fork of the specified size.

No permanent deformation shall be produced by the application of this test load after having removed the effects of any local manufacturing irregularities by up to three preliminary applications of the test load.”

(a) Does this statement imply that the aforementioned test load is applied to an extension that is mounted on an appropriate fork?

(b) Does this statement also imply that the clearly stamped individual load rating of the fork extension must be one-third or less the weight of the test load?

Answer (2): The test load should be applied when the fork extension is mounted on a fork of the specified size.

Since the minimum load fork extensions are required to be capable of supporting without deformation is three times the rated capacity, the individual load rating of the fork extension will always be one-third or less of the test load.

Question (3): ANSI/ITSDF B56.1-2012, Section 7.39.4 states “Each fork extension shall be clearly stamped...”

As an alternative to stamping, is a durable adhesive label acceptable?

Answer (3): No. The intent of the requirement is that the information be permanent and resistant to wear, similar to the fork stamping requirements in 7.27.2.2

Interpretation: 1-99

Subject: ANSI/ITSDF B56.1-2012, Section 7.30, 7.35(d), and 7.36(a)

Date Issued: October 2, 2015

Question (1): Does Section 7.30, “Operator Protection for Stand-Up, End Controlled, Narrow Aisle and Counterbalanced Trucks,” apply to all lift trucks which have one or more of the listed characteristics – a stand-up operator, an end control operator position, a narrow aisle purpose, and/or a counterbalanced design? Or does it apply only to the following types of trucks: (1) stand-up, end control, narrow aisle trucks, and (2) stand-up, end-control, counterbalanced trucks? Put another way, does Section 7.30 apply to an end control, motorized hand/rider, pallet truck?

Answer (1): The section applies to two types of trucks, one is a stand-up, end controlled, narrow aisle truck and the other a stand-up, end controlled, counterbalanced truck. The section does not apply to end control, motorized hand/rider, pallet trucks.

Question (2): If Section 7.30 applies only to (1) stand-up, end control, narrow aisle trucks and (2) stand-up end-control, counterbalance truck; what is the reasoning for not extending this operator protection standard to other stand-up, end control trucks, such as an end control, motorized hand/rider, pallet truck, where intrusion into the operator's area which presents a similar risk of injury to a riding operator?

Answer (2): This is not a request for clarification of wording in a current B56 standard and therefore beyond the scope of what ITSDF can provide.

Question (3): Does Subsection 7.36(a) apply to all end control trucks? In particular, Subsection 7.36(c) applies to motorized hand/rider trucks, but does Subsection 7.36(a) also apply to the truck if it is an end control, motorized hand/rider, pallet truck?

Answer (3): No, 7.36(a) applies to every end control truck with an operator platform except those identified in 7.36(b) and 7.36(c).

Question (4): Does Subsection 7.36(d) apply to an end control, motorized hand/rider pallet truck?

Answer (4): Yes, 7.36(d) applies to all motorized hand/rider trucks with an operator platform.

Interpretation: 1-100

Subject: ANSI/ITSDF B56.1-2012, Section 7.25.1(c) Load-Handling Controls

Date Issued: March 8, 2017

Question (1): Is it sufficient to mark only one direction of a lever if the other direction (consequentially) results from an improved and clear arrangement of the controls and their marking?

Answer (1): No. See 7.25.1(c).

Interpretation: 1-101

Subject: ANSI/ITSDF B56.1a-2018, 5.2.4 General

Date Issued: January 4, 2019

Question (1): Under 5.2.4, it states, "keep hands and feet inside the operator's compartment. Do not put any part of the body outside of the operator compartment of the truck." Is that specific to when the truck is being driven or in motion or is that required at all times no matter what?

We have “operator-up” high lift trucks (e.g., turrets) that our operators use to grab and retrieve items from elevated racking. The turret is parked and stationary when they are grabbing and retrieving items. The Turrets have fully enclosed guard rails with toe guard and mid-rails so we have adequate fall protection in place. Do they still need to keep their hands and feet inside the operator’s compartment at all times or is that requirement only when the truck is in motion?

Answer (1): This operating safety rule is intended for the operation of rider-type trucks to keep the operator’s hands, feet, and other body parts from making contact with objects outside the operator’s compartment while the truck or any of its functions are in motion. Always conduct all operations of the truck from the normal operator’s position as defined by the truck manufacturer.

Interpretation: 1-102

Subject: ANSI/ITSDF B56.1a-2018, 4.3.2 Stopping Distance, 7.16 Service Brake System Performance for Trucks Up to and Including 50 000 kg

Date Issued: January 4, 2019

Question (1): Can the formulas contained in these paragraphs in combination with Figure 2 be used to calculate the stopping distance of trucks at any speed with any loading? Or are they limited to fully loaded trucks stopping from their maximum speed?

Answer (1): No.

All of Section 7 of the Standard is for design and construction standards at the time of manufacture; Section 7.16 is in the Manufacturer section. When trucks are designed, the service brake system is tested as described in 7.16.4 and 7.16.5 under controlled testing conditions to determine if the design satisfies the performance criteria specified in 7.16.5; one of the two prescribed and repeatable test methods is the stopping distance test.

Section 4.3 is in the Users section. The stopping distance formula equation in 4.3.2 is used to calculate the approximate theoretical stopping distance of a truck descending a grade for the surface condition described. The equation in 4.3.2 is similar to the equation in 7.16.5 but also includes G (the slope of the grade in percent) to define the effect of a downward grade on the stopping distance.

Interpretation: 1-103

Subject: ANSI/ITSDF B56.1a-2018, 7.38.1(d)(2)(c) Platforms: Elevating

Date Issued: May 20, 2020

Question (1): Clause 7.38.3 states:

7.38.3 Work platforms (does not include operator platforms) shall comply with para. 7.38.1 and shall have ...

Does this clause mean that the type of platform that can be picked up by forks must also comply with the requirements in clause 7.38.1?

Answer (1): Yes, as currently written.

Question (2): Clause 7.38.1(d) gives choices of either a guard rail or a personal fall protection system as a fall restraint mean. Based on the statement of clause 7.38.3, do the choices in clause 7.38.1(d) also extend to clause 7.38.3?

Answer (2): Yes.

Interpretation: 1-104

Subject: ANSI/ITSDF B56.1-2020, 7.5.2 Nameplates and Markings

Date Issued: June 17, 2020

Question (1): ITSDF B56.1-2020 paragraph 7.5.2 requires nameplates to be “durable” and “corrosion-resistant”. Are digital nameplates compliant with these requirements and the intent of section 7.5? A digital nameplate, in this context, may be a representation of nameplate data displayed on a user interface of a digital device such as an LCD or touch screen which has been installed in the truck.

Answer (1): No. 7.5.2 requires nameplates to be “legibly inscribed.” Merriam-Webster defines inscribe as “to write, engrave, or print as a lasting record.” To meet the requirements, a nameplate needs to have the information inscribed rather than only displayed.

Interpretation: **1-105**

Subject: ANSI/ITSDF B56.1-2020, 4.6.2 Fuel Handling and Storage

Date Issued: May 11, 2022

Question (1): Does 4.6.2 of B56.1-2020 prohibit the use of composite liquid petroleum gas cylinders?

Answer (1): Unless prohibited by NFPA 505 or NFPA 58, 4.6.2 does not prohibit the use of composite liquid petroleum gas cylinders.