

- Dielectric strength tests are performed during the construction of the RV as well as on the completed Recreational Vehicle to insure that the electrical system is adequately insulated and designed safely.

Fresh Water and Drain, Waste, Vent, Plumbing Systems, their fixtures, materials and equipment must be approved and display an insignia or label of approval by a recognized testing agency such as the National Sanitation Foundation (NSF) or the International Association of Plumbing and Mechanical Officials (IAPMO).



- Water supply lines shall be sized according to the length of the line to assure an adequate flow rate to each fixture.
- Atmosphere and Anti-Siphon venting requirements are specified where necessary.
- Gas traps and venting – designated fixtures and drains are required to have a gas trap that is vented to prevent the buildup of back pressure or vacuums which could compromise the trap's water or mechanical seal.
- Required testing – Each plumbing system is tested following final assembly to insure that proper drainage flow and a leak-free system is achieved.



Comfort Heating and Cooking (LP Gas) requirements are outlined to minimize the risk of leakage that could cause a fire, asphyxiation or explosion.

- Gas piping sizes are specified to insure a gas supply that provides for safe and proper appliance performance.
- 80% stop fill devices are required on all permanently installed LP gas containers.
- Gas line routing and accessibility – all joints in gas lines must remain accessible for periodic leak testing and repair. Lines shall not be installed in areas where a nail or screw could compromise the line.
- All appliances must be listed and labeled by a nationally recognized testing agency, such as the American Gas Association (AGA), which has found the product to be safe and suitable for its intended use.
- Sealed combustion chambers are provided for all LP gas appliances, except for gas ranges, to insure separation of the combustion chamber from the interior atmosphere.
- Testing – each system must be tested during construction

and upon final assembly to determine proper leak-free performance.

Fire and Life Safety Provisions are outlined to minimize the risk of fire hazards.



- Interior finish flame – spread limitations shall not exceed 200 when tested in accordance with NFPA 255 Standard Method of Test of Surface Burning Characteristics of Building Materials. This includes walls, partitions, ceilings, doors, etc.
- Emergency egress minimum exit requirements are outlined to insure safe exit in the event of an emergency.
- Smoke detectors shall be listed under the requirements of UL 217 Standard for Single and Multiple Station Smoke Detectors.
- Provisions for portable fire extinguishers/suppression equipment shall meet the requirements as defined in NFPA 10 Standard for Portable Fire Extinguishers.
- Carbon monoxide (CO) detectors are required in all RV's equipped with an Internal combustion engine or designed with features to accommodate future installation of an internal combustion engine. This includes Truck Campers.
- Provisions for Special Transportation Vehicles or those vehicles designed for hauling internal combustion engine vehicles are outlined.
- LP Gas detectors are required in all recreational vehicles with an LP Gas appliance and electrical system and shall be listed under the requirements of UL 1484 Standard for Safety Residential Gas Detectors.
- All interior and exterior required labels (i.e. exit, potable water only, etc.) are required to be posted.

Displaying the PWA Seal

The Manufacturer's Commitment Verifying Compliance

Each Manufacturing Client of PWA, who fulfills the requirements of the PWA program, is proud to display the PWA Standards Seal. The seal is a public statement of the achievement that the manufacturers have attained in their desire and commitment to maintain compliance to the Standards. The seal is displayed with pride on the outside of the Recreational Vehicle. Look for the PWA Seal near the main entry door!



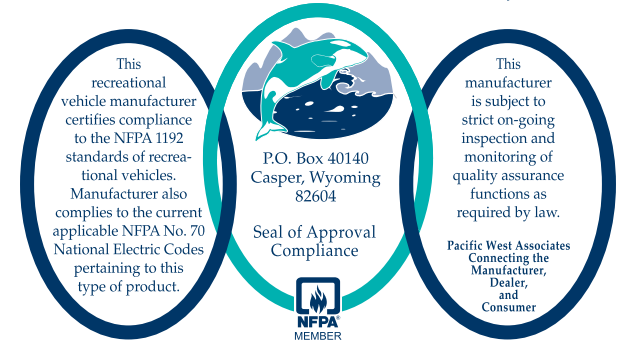
Pacific West Associates, Inc.

**Certified Independent
Third Party Agency**

**NFPA 1192
STANDARDS PROGRAM**

An overview of PWA'S NFPA 1192 Safety Standards program with a description of the process that keeps this program effective.

Pacific West Associates, Inc.



Mechanical Engineering • Electrical Engineering
Structural Engineering • Forensic Engineering

Look for the PWA Seal

*It Provides Tangible Benefits to
All Product Safety – An Integral Part
of the PWA Standards Program*

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Pacific West Associates - PWA Certified Independent Third Party

What Is A Third Party? PWA is an appointed and certified third party design approval and inspection agency qualified by meeting the criteria for agencies engaged in System Analysis and Compliance Assurance ASTM-E 541-84 Standard, (a stipulation in the American Society for Testing and Material Standard.) All Pacific West Associates manufacturer clientele are required to submit system designs which are then subject to design review to verify compliance to the NFPA 1192 Standards as well as the NFPA 70 NEC electrical codes. Other industry associations do not meet the strict criteria as set forth in the ASTM-E 541-84 Standards nor do they participate in systems design review.

PWA is a Certified Independent and Non-Partial Third Party whose clientele include the manufacturers and service firms who produce or service Recreational Vehicles. PWA recognizes all segments of the industry so they may, collectively, have direct influence upon matters of public safety and interest involving the enhancement of the industry. The Associate's clientele produce 70% of all Domestic and Foreign built Recreational Vehicles.

What are Recreational Vehicles? RV's are recreation vehicles primarily designed and intended to provide temporary living quarters for recreation, camping or seasonal use. They are built on a single chassis, mounted on wheels with a gross trailer area not exceeding 400 square feet when set up. Each RV trailer is certified by its manufacturer as complying with the NFPA 1192 standards, as well as the NFPA 70 NEC codes. Proof of this certification is evidenced by the application of the Pacific West Associates seal of compliance. There are many different types of Recreational Vehicles offered by the Industry today. Some are very compact towable units that can be expanded in size at the park. These units can typically be towed by the smaller more fuel-efficient vehicles made today. Others are much larger and offer more amenities such as a wider range of convenience appliances and comfort facilities. These units are typically towed with a larger towing capacity vehicle and offer expanded living capabilities at the park. Yet another type of product is designed to be transported in the bed of a Pick-up type truck. The motorized product is similar to the towable except that the power train is included in the living quarters. Many of these Motor Homes are capable of towing a smaller transportation vehicle often called a "dinghy", this allows for more versatile transportation on crowded city streets or remote country roads.

The Standard - NFPA 1192

What is the Standard NFPA 1192 and how is it created? The American National Standards Institute (ANSI) is a non-profit association, which establishes protocol, and guidelines to create

accepted minimum safety standards for products used by both consumers and industry. ANSI sanctions standards that have been created following strict consensus protocol that allow all affected entities a voice in their development. Among the critical issues reviewed by ANSI is the makeup of the committee empowered to establish or revise the Standard. All segments must be represented and NO INTEREST GROUP OR TRADE ASSOCIATION can be in a position to dictate or influence the outcome.

A Standards-making committee for Recreational Vehicles has existed since 1937, and the canvass method was utilized to create the first safety standard sanctioned by ANSI in the early 1960's. The Standard covers hundreds of safety related requirements that must be complied with in the production and/or repair of RV's. The A119.2 Standard was revised, using the canvass method, in 1977. Subsequent canvass method reviews also occurred in 1982 and again in 1986, 1990, 1993, 1996, 1999, 2002, 2005, 2008 and 2011. In the 2005 edition the committee completed an editorial revision to the standard and merged the requirements from ANSI A119.2 into NFPA 1192. ANSI A119.2 will no longer be published. Requirements found in the Standard (either directly or by reference) include sections covering electrical, plumbing, heating, air conditioning, fire and life safety issues. Copies of this Standard are available from PWA.

The PWA Pledge.

Manufacturers Build and Design to The Standards. Upon joining PWA, manufacturers are required to pledge that they will build RV's that conform to the NFPA 1192 Standard, as well as the NFPA 70 NEC codes. The commitment reads: "We pledge to produce Recreational Vehicles in compliance with the NFPA 1192 standard and the NFPA 70 NEC and agree to allow initial and ongoing unannounced inspections to substantiate our commitment. Further, we agree to submit for independent review, any and all design submittal drawings to PWA." PWA mandates an ongoing strict inspection and design review/approval process. As a certified third party engineering firm, PWA is subject to strict ongoing performance audits by the State agencies PWA represents. Affiliation with Pacific West Associates may be revoked or be subject to disciplinary action following due process should the manufacturer fail to achieve or maintain the required conformance to the NFPA 1192, NFPA 70 NEC Standards.

Standards Inspections

PWA inspects product built to approved designs at the manufacturing facility and observes all required tests and test equipment to verify compliance to all applicable codes and laws. Unlike other trade association inspections, PWA inspects client

product to approved plans and specifications. This includes systems such as plumbing, LP gas, 12 volt & 110/240 volt electrical as well as fire/life/safety systems.

Standards Enforcement and Verification

There are several State Governments or Agencies that mandate NFPA 1192, NFPA 70 NEC compliance. These governments have established programs that regulate the construction of Recreational Vehicles. These states include: Arizona, California, Colorado, Kentucky, Missouri, Nebraska, Oregon, Tennessee, and Washington. Additional states require NFPA 1192 compliance, but do not maintain an enforcement program. Manufacturers affiliated with PWA will not only meet but also exceed industry standards to insure that their product maintains the highest possible level of compliance regardless of its destination. In addition, courtrooms all across America have acknowledged the NFPA 1192, NFPA 70 NEC Standards as nationally recognized safety standards and recognize them in determining the minimum levels of safety compliance for RV's.

Maintaining Uniformity and Standardization of the Program

Updates and New Technology Education. Keeping the manufacturer informed about updates and insuring that the inspections and enforcement procedures are uniform in their application, are two of the primary missions of PWA. The NFPA 1192 Handbook and the NFPA 70 NEC Codes handbook provide guidance to the manufacturer, suppliers and repair firms. Additionally, PWA conducts dozens of educational "practicum" seminars at the manufacturing facilities to enhance the knowledge and awareness of production and design personnel.

Key Points from the 2011 NFPA 1192 Recreational Vehicle Standard and the NFPA 70 NEC Code



12 Volt and 110 Volt Electrical Requirements as specified in Article 551 and other applicable sections of NFPA 70, of the National Electrical Code.

- Ground Fault protected receptacles are specified where they are required for safety.
- Only approved electrical fixtures, appliances, equipment and materials bearing proof of compliance and labeled by a nationally recognized testing agency are allowed.