

Helpful Tips for Trailer Certification
Phase 2 Trailer Standards
May 30 2019

Note: Staff will continue to update this document with more current information, as available.

In 2018, the California Air Resources Board (CARB) adopted new standards for trailers as part of the California Greenhouse Gas (GHG) Emissions Standards for Medium- and Heavy-Duty Engines and Vehicles (Phase 2 rules). To legally sell trailers manufactured on or after January 1, 2020 in California, manufacturers must certify trailers in California. CARB staff developed this document to help answer trailer manufacturers' potential questions.

GENERAL INFORMATION

1. Who is responsible for complying with the California Phase 2 trailer standards?

Trailer manufacturers that sell trailers to California fleets are the primary regulated entities, Trailer aerodynamic device manufacturers (i.e., those that make skirts, tails, etc. to improve trailer aerodynamics), although not directly regulated, may request pre-approval of devices that improve trailer aerodynamics. These pre-approved devices can be used by trailer manufacturers when configuring trailers to meet the trailer standards. See Questions 19 to 22. Owners, operators, and fleets do not have additional regulatory requirements under the Phase 2 rules other than to follow the trailer manufacturer's maintenance instructions (such as specifications for tire replacement – See Question 18). Note that trailer modifications to the emissions control components during and after the useful life may violate California Vehicle Code 27156 and title 13, CCR, 2220 et seq.

Please note that California has a separate trailer fleet regulation, the Tractor-Trailer GHG (TTGHG) Regulation, that applies primarily to the owner-operators of long-haul tractor-trailers that travel on California highways. The TTGHG Regulation is not limited in applicability to trailers sold in California. It applies to all long-box type trailers, including both dry-van and refrigerated-van trailers, traveling in California. For more information, go to <https://www.arb.ca.gov/cc/hdghg/hdghg.htm>.

2. When do the California Phase 2 trailer certification standards take effect?

CARB's Phase 2 trailer certification standards apply to regulated model year 2020 trailers that are produced on or after January 1, 2020, regardless of business size. Large and small business trailer manufacturers have the same compliance date. See Question 6 for a description of the types of trailers covered.

The trailer program establishes progressively more stringent standards for model year 2020, 2021, 2024, and 2027 trailers.

3. Why did CARB adopt trailer certification standards and what benefit will they provide?

The U.S. Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration initially developed the trailer certification standards as part of their federal Phase 2 GHG standards in order to reduce GHG emissions and avoid unnecessary fuel consumption. CARB adopted Phase 2 GHG trailer standards identical to the U.S. EPA GHG trailer standards except that California standards start with the 2020 model year (i.e., two years later than the U.S. EPA trailer standards). CARB's trailer standards are a critical step in helping the state meet its GHG reduction goals to mitigate climate change (i.e., 2030 and 2050 goals of reducing carbon dioxide (CO₂) levels 40 percent and 80 percent from 1990 levels, respectively). The trailer standards continue the work California started when it first addressed trailer-related emissions via the TTGHG Regulation. The fully phased-in trailer standards are more stringent and apply to additional trailer types beyond those covered by the TTGHG Regulation.

The fully phased-in trailer standards achieve up to 9 percent lower CO₂ emissions compared to an average model year 2017 trailer. The fuel saving technologies (aerodynamic devices, low rolling resistance tires, tire pressure systems, weight reduction) used on these trailers generally have a payback period of two years or less (meaning that fuel savings will offset their purchase cost within this time). This could translate to a fuel savings of about \$20,000 over the life of an average model year 2027 trailer.

Overall, the federal Phase 2 rules in California are expected to result in a reduction of over 200 million metric tons of CO₂ equivalent emissions in California from 2019 to 2050. This is equivalent to saving over 20 billion gallons of diesel fuel in the same time period. It was estimated that one-quarter of those savings would result from trailer standards.

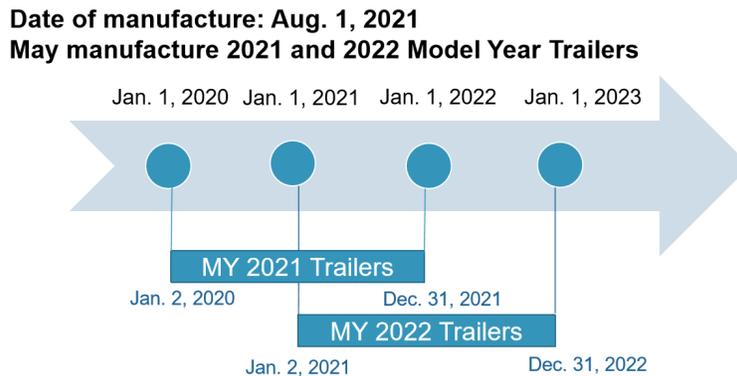
4. What is the responsibility of the end user (the trailer operator, owner)? Is there a responsibility of users to keep trailers in certified condition?

As mentioned in Question 1, the Phase 2 rules do not impose new requirements on owners, operators, and fleets other than to follow the trailer manufacturer's maintenance instructions provided in the owner's manual. As part of the maintenance requirement, manufacturers must explain what the owner responsibility is for maintaining the emissions control technologies on the trailer in the owner's manual. Owners who

modify the trailer from its initial configuration could be found in violation of California Vehicle Code 27156 and title 13, CCR, 2220 et seq., which prohibit tampering of emissions control systems. As provided in Title 40 CFR 1037.655, only modifications for the purpose of reducing emissions are allowed.

5. How is model year defined?

Model year must include January 1 of the calendar year for which the MY is named, may not begin before January 2 of the previous calendar year, and it must end by December 31 of the named calendar year. The model year may be set to match the calendar year corresponding to the date of manufacture. See example below.



REGULATED TRAILER TYPES

6. What types of trailers are subject to the California Phase 2 trailer certification standards?

- Long-box dry vans (greater than 50.0-feet in length)
- Long-box refrigerated vans (greater than 50.0-feet in length)
- Short-box dry vans (50.0-feet and shorter in length)
- Short-box refrigerated vans (50.0-feet and shorter in length)
- Tank trailers designed to transport liquids or gases



- Flatbed trailers with continuous, flat platforms



- g. Container chassis (all lengths)



7. Which trailers are excluded from the California Phase 2 trailer certification standards?

- a. Trailers built before January 1, 2020
- b. Trailers pulled exclusively by pintle hook or hitch; not designed to be pulled by Class 7 or 8 tractors
- c. Non-box trailers that do not meet the definition of flatbed trailers, tank trailers or container chassis
- d. Trailers with four or more axles, and trailers less than 35-feet long with three axles
- e. Trailers intended for temporary or permanent residence, office space or other work space
- f. Trailers with a gap of 120 inches or more between adjacent axle centerlines. This axle spread exclusion does not apply to trailers with adjustable axles that have the ability to be spaced less than 120 inches apart.

Note that the following types of equipment are not trailers:

- a. Top loading dry bulk “vans”
- b. Containers that are not permanently mounted on chassis
- c. Dollies used to connect tandem trailers
- d. Expandable, gooseneck, drop deck or lowboy platform trailers
- e. Dry bulk tank trailers with hoppers
- f. Tank trailers if main purpose is for storage (fractanks)

8. Do I have to contact CARB if I produce excluded trailers?

Trailer manufacturers that exclusively manufacture trailers that meet our definitions of excluded vehicles have no regulatory requirements and do not need to certify their trailers in accordance with California’s Phase 2 trailer certification standards. Trailer manufacturers do not need to contact CARB if they produce only excluded trailers. However, CARB staff recommends that trailer manufacturers contact us if they are unsure if their trailers are excluded. See Question 35 for CARB contact information.

9. Are trailers produced outside the United States and imported into California subject to the California Phase 2 trailer certification standards?

Yes, a trailer is subject to the California Phase 2 trailer certification standards if it is sold, offered for sale, imported, or introduced into commerce for sale, registration or resale in California.

Trailer manufacturers based outside of the United States must certify all trailer-types subject to the California Phase 2 trailer certification standards that are sold in California.

CERTIFICATION PROCESS

10. How do I register my company for California Phase 2 trailer certification?

Manufacturers applying for certification for the first time must become registered with CARB. Please do the following:

- a. Send a Letter of Intent: A physical letter which states the intent of the manufacturer to certify with CARB and presents an overview of what will be certified. A template is provided on the trailer certification webpage.
- b. Provide Authorized Contact Information: A spreadsheet which includes manufacturer name and a complete list of the manufacturer's contact information. A template is provided on the trailer certification webpage.
- c. Provide your U.S. EPA Manufacturer Code: Manufacturers wishing to certify trailer families must register with U.S. EPA as a manufacturer and receive an U.S. EPA manufacturer code. Your three-digit manufacturer code and a confirmation letter from U.S. EPA must be submitted to TrailerCert@arb.ca.gov.

This must be completed before submitting the first certification application.

11. How do I obtain my 3-character manufacturer code for certification?

As part of company registration, trailer manufacturers must electronically register for a unique manufacturer code to U.S. EPA following the instructions at <https://www.epa.gov/vehicle-and-engine-certification/users-guide-registering-company-manufacturer-code-verify>.

CARB is utilizing the U.S. EPA manufacturer code process to ensure consistency between CARB and U.S. EPA certification programs. Manufacturer codes are issued to a company, and that code is used in every sector they certify products. Using this registration process eliminates the possibility of issuing a trailer manufacturer a 3-character code that is already in use in another certification sector that CARB may be unaware of, which could cause problems in the future.

Once you complete this process, the manufacturer code for your company will be sent to the MyCDX Inbox and the business email address provided during registration. This manufacturer code is required to complete the certification process with CARB.

For trailer manufacturers who obtained their manufacturer code for trailers from U.S. EPA ahead of time, you can use your existing manufacturer code. Manufacturers need to provide a copy of the email with the assigned 3-character manufacturer code to CARB.

Note: This registration with U.S. EPA will only be used to obtain a manufacturer code. It will NOT be used to submit certification application information.

12. Can a manufacturer with multiple facilities receive a single 3-character manufacturer code?

Trailers produced in multiple facilities operating under a single parent corporation may be certified with the same manufacturer code or with separate manufacturer codes, depending on how responsibility is shared among company officials. Manufacturers are encouraged to use a single 3-character manufacturer code for all facilities unless there is a real need to use multiple codes.

13. How will manufacturers certify their trailers in California?

Manufacturers applying for certification must submit a Letter of Intent and Authorized Contact Information Form as well as the email from U.S. EPA with the assigned 3-character manufacturer code. This is to be sent to CARB before submitting the first certification application.

The assigned CARB certification staff will provide a certification guidance document where manufacturers would fill out the certification application web form and submit supporting documents through this email to TrailerCert@arb.ca.gov.

14. For trailer manufacturers that offer multiple trailer types and configurations, how many certification applications need to be submitted?

A manufacturer must submit one certification application for each trailer family that they offer. A trailer family is a grouping of similar trailers made by one manufacturer that are all subject to the same standard, limited to a single model year, and covered by a single CARB executive order. There are ten possible trailer subcategories (“i.e., full-aero long box dry vans, full-aero long box refrigerated vans, full-aero short box dry vans, full-aero short box refrigerated vans, etc.”), and typically there will be one trailer family per subcategory that a manufacturer offers. However, because manufacturers may combine subcategories into fewer families, the number of certification applications per manufacturer may vary. For example, for the full-aero long box dry van subcategory, a manufacturer may choose to include both long box dry vans and refrigerated vans in the same family.

15. Will CARB issue any other guidance related to California Phase 2 trailer certification?

All trailer certification documents are available at Phase 2 Trailer Certification webpage <https://ww2.arb.ca.gov/our-work/programs/greenhouse-gas-standards-medium-and-heavy-duty-engines-and-vehicles/phase-2-ghg>. Interested manufacturers should also subscribe at https://public.govdelivery.com/accounts/CARB/subscriber/new?topic_id=caphase2ghg for updates on CA Phase 2 and information on upcoming workshops/meetings.

TECHNOLOGY OPTIONS AND MEASURING TRAILER PERFORMANCE

16. Can I still use my old trailer? Do I have to add technologies to my old trailer?

The California Phase 2 trailer certification standards only apply to new trailers manufactured for sale in California. There are no requirements for owners or operators to retire or retrofit in-use trailers. *(However, California's TTGHG regulation does apply to in-use trailers and may require trailer fleet owners to retrofit their in-use trailers. The TTGHG Regulation applies primarily to the owner-operators of long-haul tractor-trailers that travel on California highways. The TTGHG Regulation is not limited in applicability to trailers sold in California. It applies to all in-use long-box type trailers, including both dry-van and refrigerated-van trailers, traveling in California. For more information, go to <https://www.arb.ca.gov/cc/hdghg/hdghg.htm>.)*

17. Do new trailers need specific technologies to meet the California Phase 2 trailer certification standards?

Depending on the type of trailer the California Phase 2 trailer certification standards either require specific technologies or require the trailers to meet performance standards.

Non-box trailer standards for flatbed trailers, tank trailers, and container chassis, as well as standards for box vans designated as “non-aero”, are design standards that require trailer manufacturers to install a certain level of low rolling resistance tires and a tire pressure system such as Tire Pressure Monitoring System (TPMS) or Automatic Tire Inflation System (ATIS). The design standards do not require the use of any specific make or model of technology.

Box van standards (other than “non-aero”) are performance-based standards. Manufacturers can meet the overall trailer performance requirements with any combination of technologies, including the use of aerodynamic improvements, low rolling resistance tires, tire pressure systems, weight reduction, or other “off-cycle technology.” See Question 27 for more info on off-cycle technology provisions.

Manufacturers have several options of technologies that can help them meet the performance standards for a given model year. The performance standards do not require the use of any specific technology type, make, or model. Manufacturers must demonstrate that the trailer meets the performance standard by using the compliance equation.

$$e_{\text{CO}_2} = (C_1 + C_2 \cdot \text{TRRL} + C_3 \cdot \Delta C_d A + C_4 \cdot \text{WR}) \cdot C_5$$

The manufacturer is responsible for inputs. Regression coefficients (C1 to C5 are constant values, C5 is the input for tire pressure systems) can be obtained directly from a table that would be provided in the trailer certification application guidance document, tire rolling resistance level (TRRL) can be obtained from the tire manufacturer, delta CdA can be obtained from the pre-approved aerodynamic device or from your own aerodynamic testing, and the weight reduction (WR) technology value can also be obtained from the provided table.

18. Does the end-user have to install the same Low Rolling Resistance tires when they need replacement?

Trailer manufacturers must include sufficient rolling resistance information in their maintenance instructions to allow end-users to purchase replacement tires that meet the appropriate performance specifications.

End-users can replace tires with tires of a different make or model as long as their rolling resistance performance is equivalent to or better than the original tires' performance.

19. Must trailer manufacturers perform testing?

Performance-based standards apply as described in Question 17, but the trailer program is designed to limit the amount of testing needed. Manufacturers can install tire pressure systems or lightweight components with pre-determined performance values (no testing needed). They can also obtain tire rolling resistance performance data directly from tire manufacturers. Aerodynamic device manufacturers may conduct testing and submit their test data to CARB for pre-approval, for trailer manufacturers to use for certification. Trailer manufacturers have the option to measure the performance of their tires, aerodynamic improvements, or lightweight components if they choose, but we expect them to be able to certify their trailers without performing their own tests.

20. What is the difference between SmartWay verification and Heavy-Duty Phase 2 certification?

U.S. EPA's SmartWay testing protocols are slightly different than the Phase 2 certification testing requirements and manufacturers must work with each program separately. These differences are explained further in Questions 21 to 22.

21. If a device manufacturer's technology is already SmartWay-verified, can trailer manufacturers use those devices for certification?

Trailer manufacturers may use devices pre-approved based on pre-2018 SmartWay verification for certification for model year 2020 only.

However, trailer manufacturers wishing to continue use of pre-approved devices for model year 2021 and beyond, where approval was based on pre-2018 SmartWay verification, must have the devices tested using Phase 2 procedures and a new pre-approval request must be submitted to CARB.

Manufacturers must perform testing using Phase 2 test procedures for any new aerodynamic trailer tests.

22. Do device manufacturers have to submit data to both SmartWay and the Phase 2 rules?

No. Smartway is a voluntary U.S. EPA program separate from the Phase 2 rules that reduces freight transportation-related emissions by accelerating the use of advanced fuel-saving technologies. Device manufacturers may continue to seek SmartWay verification from U.S. EPA at their own discretion. However, trailer manufacturers cannot apply SmartWay verification for Phase 2 certification. Only Phase 2 pre-approved devices can be used by manufacturers to meet the Phase 2 trailer standards.

23. Can a trailer be certified for Phase 2 without using any aerodynamic technologies?

Non-aero box van trailers and non-box trailers (flatbed trailers, tanker trailers, and container chassis) do not have aerodynamic requirements. Box vans may potentially certify for Phase 2 without aerodynamic technologies as long as the trailer has other technologies to meet the trailer performance standards.

24. Are there approved software packages for Computational Fluid Dynamics (CFD) testing?

There are specifications for software that can be found in Title 40 CFR 1037.532. A manufacturer may also check with its certification representative before purchasing CFD software.

25. What if trailer manufacturers believe their trailer technologies will perform better than as measured by others?

Trailer manufacturers always have the option to perform their own testing. They must do testing if the data aren't otherwise available.

26. What emissions credit is offered for TPMS and ATIS?

TPMS receives a CO2 emissions reduction credit of 1 percent, whereas ATIS receives a CO2 emissions reduction credit of 1.2 percent. ATIS is attributed a larger emissions reduction credit as tires are inflated automatically when needed, whereas TPMS requires action on the part of the operator to reinflate the tires to the appropriate pressure. This means there is a larger chance that tires are underinflated when equipped with TPMS relative to ATIS. Trailers equipped with a combination of ATIS and TPMS only receive an emissions reduction credit of 1 percent like TPMS as this configuration still requires human interaction and leaves a chance that tires operate underinflated while in operation.

27. Which trailer technologies can be tested using off-cycle provisions?

Off-cycle provisions are available for trailers subject to performance standards if a technology is expected to reduce CO2 emissions, but its performance is not captured in the trailer compliance equation. Manufacturers can evaluate lightweight components by comparing the weight of a light-weight trailer to a baseline trailer. Additional examples of off-cycle technology include the use of solar power or regenerative braking. Manufacturers should contact CARB prior to testing off-cycle technologies.

LABELING

28. Does my regulated trailer need a label?

Yes, all regulated trailers are required to have a permanent label indicating that they are certified vehicles.

29. Does the label need to be in a specific location on the trailer?

We do not specify a location for the label, but it must be easily visible for inspection.

30. Do I have to create a separate label or can I place emissions information on my current label?

We do not require emissions information be on a stand-alone label. The information required by Title 40 CFR 1037.135 can be added to an existing label as long as it meets the durability requirements outlined in Title 40 CFR 1068.45.

31. What information must be included on the label? Must it list all devices used on the trailer? Must it include compliance equation results?

Specific requirements for the label are outlined in Title 40 CFR 1037.135. The label must list the components installed on the trailer for compliance with the standards. For every trailer where any of the technologies listed in Appendix III to Part 1037 (Emission Control Identifiers) are used to demonstrate compliance during certification of that configuration, the Emission Control Identifier must be listed on the label. If a manufacturer uses technologies from Appendix III but does not rely on that technology to demonstrate compliance, that technology does not need to be included on the label. In addition, many weight reduction components and off-cycle technologies are not listed in Appendix III and therefore are not required to be listed on the label.

The label does not include compliance equation results.

32. Do I need to affix a label on excluded trailers?

No label is required for trailers excluded under Title 40 CFR 1037.5.

33. Can I exempt any trailers from certification?

For model years 2020 to 2026 trailers, the program does provide each manufacturer with a limited allowance of trailers that do not need to meet the standards via provisions called “transitional allowance.” Manufacturers can use this allowance to produce and sell a specified amount of trailers that do not meet the CO2 emission standards. Up to 20 percent of total California-directed production volume can be exempted via this transitional allowance; however, in no case may the number of exempted box vans for a manufacturer be greater than 350 units in any given model year. For non-box trailers, the exemption is up to 250 annual units.

Note that manufacturers must affix a trailer label that states the trailer is exempted.

34. Do I need to affix a label on trailers exempted using the transitional allowance for Model Years 2020-2026?

Yes, trailers exempt under the transitional allowance provision outlined in Title 40 CFR 1037.150(v) must include a permanent label that meets the requirements of Title 40 CFR 1068.45(a), the corporate name of the trailer manufacturer, and a statement that the trailer is exempt under Title 40 CFR 1037.150.

RESOURCES

35. How can I get more information?

For further information about complying with the trailer regulations, please email TrailerCert@arb.ca.gov. You may also access trailer certification and rulemaking document web pages at <https://ww2.arb.ca.gov/our-work/programs/greenhouse-gas-standards-medium-and-heavy-duty-engines-and-vehicles/phase-2-ghg> and <https://ww2.arb.ca.gov/rulemaking/2018/phase-2-and-tractor-trailer-amendments-regulation>.