Guidance for Ethanol Facilities Seeking an Efficient Producer Pathway that Allows Co-Production of Ethanol from Corn and Grain Sorghum Starch and Fiber

EPA United States Environmental Protection Agency

Guidance for Ethanol Facilities Seeking an Efficient Producer Pathway that Allows Co-Production of Ethanol from Corn and Grain Sorghum Starch and Fiber

Implementation, Analysis and Compliance Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

United States Environmental Protection Agency

EPA-420-B-25-021
August 2025

Guidance for Ethanol Facilities Seeking an Efficient Producer Pathway that Allows Co-Production of Ethanol from Corn and Grain Sorghum Starch and Fiber

August 2025

Purpose

This document provides guidance on the steps to follow for ethanol facilities that wish to generate D code 5 or 6 RINs for ethanol produced through an Efficient Producer Petition Process (EP3) pathway and D code 3 RINs for ethanol concurrently produced from corn kernel fiber or a mix of corn and grain sorghum kernel fiber at the same facility. This document provides background information on the EP3 petition process, followed by guidance on the process steps. This guidance is not binding, nor does it create any new obligations on the regulated community. It does not affect the EPA's review of new RFS pathway petitions submitted pursuant to 40 CFR 80.1416. The EPA reviews pathway petitions on a case-by-case basis. The information in this document may not be relevant in specific situations.

This guidance supersedes the March 2024 guidance that was limited to facilities seeking to generate D code 6 RINs for ethanol produced from corn starch through an EP3 pathway and D code 3 RINs for ethanol concurrently produced from corn kernel fiber.

Background

The EPA evaluates the lifecycle emissions associated with biofuel pathways to determine whether the fuels meet the statutory requirements for eligibility under the RFS program.[1] In 2014, the EPA developed the expedited EP3 process for ethanol producers that demonstrate superior process efficiency, such as through reduced onsite energy consumption per gallon of ethanol produced.

Efficient Producer Pathways and Ethanol Produced from Corn or Sorghum Kernel Fiber

To date, the EPA has approved EP3 pathways for over 100 ethanol production facilities. Volumes of corn starch ethanol produced through approved EP3 pathways are eligible to generate D code 6 RINs ("D code 6 corn starch ethanol"), and volumes of grain sorghum ethanol produced through an advanced EP3 pathway may be eligible to generate D code 5 RINs ("D code 5 grain sorghum ethanol").[2]

Before March 2024, EP3 approvals were generally conditional upon the facility generating only D code 6 RINs.[3] In March 2024, the EPA updated the EP3 process to give EP3 facilities flexibility to generate D code 3 RINs for ethanol produced from corn kernel fiber. The EPA is once again updating the EP3 process to give EP3 facilities added flexibility – this time to generate D code 3 RINs for ethanol produced from a mixture of corn and grain sorghum kernel fiber. We are adding this flexibility now because ASTM test method E3417-25 was recently approved,[4] which facilitates determinations of the amount kernel

[1] For more information see: https://www.epa.gov/renewable-fuel-standard-program/fuel-pathways-under-renewable-fuel-standard

[2] In general, ethanol produced from grain sorghum ethanol is already eligible for D code 6 RINs without an EP3 pathway.

[3] The one exception is that in August 2021, EPA approved an EP3 pathway that allowed for production of D code 5 ethanol from grain sorghum produced concurrently with D code 6 ethanol from corn starch.

[4] ASTM. (2025). "Standard Test Method for Determination of Cellulose/Hemicellulose-Derived Glucan and Galactan Content in Solid Corn and Corn-Sorghum Blended Biomass Samples." April 11, 2025

fiber cellulosic biomass converted to ethanol when a mixture of corn and grain sorghum are used as feedstocks.

At this time there are 21 approved EP3 pathways for facilities to generate D code 6 RINs for ethanol produced from corn and grain sorghum starch feedstocks. We are issuing updated pathway approval letters to these 21 facilities with approved EP3 pathways. The updates allow these facilities to generate D code 6 RINs for ethanol produced from corn or grain sorghum starch and D code 3 RINs for ethanol produced from corn kernel fiber or a mix of corn and grain sorghum kernel fiber. These facilities are not obligated to take any action as a result of these updates; however, if they wish to generate D code 3 RINs for coproduced cellulosic ethanol they must submit an updated Compliance Monitoring Plan as described in the updated approval letters.[5]

Facilities should note that different test methods are required to determine the amount of cellulosic biomass converted to ethanol depending on which feedstocks are used. At this time, the EPA accepted methodologies for facilities that only process corn feedstock are the NREL Method[6] and ASTM E-3417, and the EPA accepted methodology for facilities that process corn and sorghum is the updated ASTM E3417-25. The appropriate test methods change in the future if additional test methods are approved.

To facilitate additional coproduction of cellulosic ethanol in the EP3 context, and to streamline the process steps for these facilities, we are making corresponding updates to our guidance for the EP3 process. First, we are updating the "How to Prepare an Efficient Producer Petition" document to clarify that facilities may petition for EP3 pathways that allow facilities to generate D code 3 RINs for coproduced cellulosic ethanol. Second, we are updating the EP3 Calculator used to estimate rolling average lifecycle emissions for EP3 pathways and the associated instructions. Third, we are creating new templates for EP3 determinations that incorporate coproduction of D3 ethanol.

Available Next Steps

Facilities that are not currently approved for an EP3 pathway, or that wish to add flexibilities to their existing EP3 pathway to allow them to use corn and grain sorghum kernel fiber feedstock or generate D code 3 RINs for coproduced cellulosic ethanol can take the following steps:

1. Prepare and submit an EP3 pathway petition, pursuant to 40 CFR 80.1416, requesting an EP3 pathway that includes the desired feedstock flexibilities.[7]
2. Upon EPA's approval of the pathway petition, prepare and submit registration applications for 1) the new EP3 pathway, and if applicable 2) the D code 3 cellulosic ethanol pathway.

---

[5] For the approval letters, see: https://www.epa.gov/renewable-fuel-standard-program/approved-pathways-renewable-fuel#EP3

[6] Michel, Katie, Justin Sluiter, Courtney Payne, Ryan Ness, Brittany Thornton, Michelle Reed, Alexa Schwartz, and Ed Wolfrum. (2021). "Determination of Cellulosic Glucan Content in Starch Containing Feedstocks Laboratory Analytical Procedure (LAP)," Issue Date: February 26, 2021. Golden, CO: National Renewable Energy Laboratory. NREL/TP-2800-76724. https://docs.nrel.gov/docs/fy21osti/76724.pdf; Michel, Katie, Justin Sluiter, Courtney Payne, Ryan Ness, Brittany Thornton, Michelle Reed, Alexa Schwartz and Ed Wolfrum. (2021). "Direct Determination of Cellulosic Glucan Content in Starch Containing Samples." Cellulose 28:1989-2002. https://doi.org/10.1007/s10570-020-03652-2

[7] For instructions see: https://www.epa.gov/renewable-fuel-standard-program/how-prepare-efficient-producer-petition-under-renewable-fuel

3. Coordinate with the EPA as necessary to ensure that all registration application requirements are met and receive the EPA's acceptance of the registration application submitted in step 2.[8]
4. Use the updated EP3 Calculator and comply with the conditions in their facility's EP3 determination document to demonstrate their fuel satisfies the lifecycle emissions reduction criteria to qualify for RINs.

Facilities that are currently registered for an EP3 pathway and that are now receiving an updated EP3 approval that allows additional flexibilities to generate D code 3 RINs for coproduced cellulosic ethanol can, if they wish to generate D code 3 RINs and are not already registered to do so, take the following steps:

1. Prepare and submit an updated EP3 pathway Compliance Monitoring Plan that accounts for coproduction of D code 3 cellulosic ethanol.
2. If applicable, prepare and submit a registration application for the D code 3 cellulosic ethanol pathway.
3. Coordinate with the EPA as necessary to ensure that all registration application requirements are met and receive the EPA's acceptance of the registration materials submitted in steps 1 and 2.
4. Use the updated EP3 Calculator and comply with the conditions in their facility's EP3 determination document to demonstrate their fuel satisfies the lifecycle emissions reduction criteria to qualify for RINs.

Contact for Questions

For questions on about this guidance please contact us by email at the following address: EP3pathways@epa.gov

[8] For information on fuel program registration see: https://www.epa.gov/fuels-registration-reporting-and-compliance-help/registration-fuel-programs