



FeneVision® Best Practice

NFRC Interface Implementation (BP0139)

Revision	Date	Description of Change	Revised By
A	06/19/2020	Initial Document	RJA
B	07/06/2020	Small updates and clarifications	TRC
C	07/14/2023	Updated for 2023 standards	NPM
D	8/29/2023	Updating to have better descriptions and NFRCCALC attribute.	NAL
E	12/07/2023	Added section for multi-sash window ratings	NPM

Introduction

NFRC stands for the National Fenestration Rating Council. It is a government rating agency that gives consumers energy performance ratings. Manufacturers have the option to select from several rating agencies, others include NAMI, and Keystone. The NFRC label can be printed with or without the EnergyStar rating. The EnergyStar rating adds a map to the bottom of the NFRC label.

Purchasing the NFRC interface includes the EnergyStar interface, but this is two unlocking bits. Even if the customer is only using NFRC, the EnergyStar bit must be unlocked to be used.

Before configuring the interface, determine the following:

- Where does the manufacturer want their customers to see the ratings? Ask about the following locations:
 - Production label (Minimum)
 - Order Acknowledgement within the options list
 - Web Options Wizard:
 - Locked Question – Appears on the Dealer’s quote to the Contractor from Web (Recommended)
 - Informational Hold – Not maintained in the database and will not appear anywhere else
- Gather ratings via spreadsheets. There should be a spreadsheet per product approved by NFRC.
- Is the customer currently pulling from pre-printed rolls OR is this a new process for production?
- Will the labels be printed by schedule in the office or by completion scan at a Wrapper Tracking Station?
- Are EnergyStar ratings available as well? (i.e., The EnergyStar map will be included on the label)
- Confirm label size to be used (4x6 is standard for NRFC and EnergyStar)
- Confirm the existence of a ZPL printer and its location
 - Upon completion scan, need dedicated ZPL printer at the Tracking Station. For Window and Door manufacturers, this is typically the Wrapping station. The labels can be printed at schedule release, if needed. (Recommended)
 - During schedule release, can use existing ZPL printer, but will print labels for the entire schedule.
- What values should be used for the following on the label:
 - Company Name
 - Company Phone Number (Optional)
 - Manufacturer ID
- Determine if the customer sells to USA and Canada as additional attribute configuration is required if they need to support both

Using

Without this interface, manufacturers have pre-purchased NFRC labels printed and production must select the correct label for each window as it comes off the production line.



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Once implemented, manufacturers reduce the risk of miss-labeling and reduce the cost of stocking so many variations of labels. As a unit is completed, typically at a Wrapping Tracking Station, the correct NFRC label will automatically print at a ZPL printer. The worker will attach the label to the window and then wrap it for shipping. These labels stay on the window through home installation.

NFRC Temporary Label Layout

Part Number and/or Part Description

Company Name / Mfg ID

Note: Phone Number can optionally be placed underneath the Company Name

Note: CPD# and/or Mfg ID can optionally be placed at the top of the dotted-line box

Options – Options separated by bullets.

Product Type

 National Fenestration Rating Council CERTIFIED	World's Best Window Co.	
	Millennium 2000+ Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: Vertical Slider	
ENERGY PERFORMANCE RATINGS		
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient	
0.35	0.32	
ADDITIONAL PERFORMANCE RATINGS		
Visible Transmittance		
0.51	_____	
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>		

Setup/Configuration

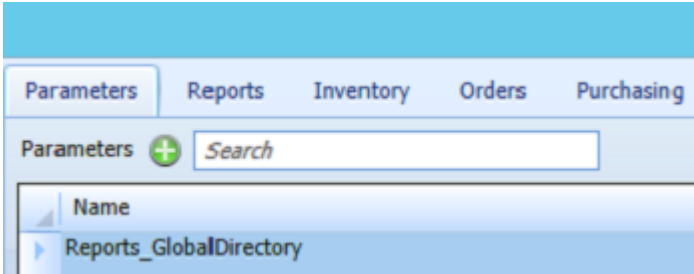
The following sections explain how to configure and complete the rollout of the NFRC Interface.

Once unlocked, the NFRC interface appears in CORE > Setup > Interfaces Menu. Unlike machine interfaces, a record does not need to be added into the interfaces table of FVMaster for the setup screen to appear.

The .zpl labels used in the setup need to exist in the path specified by the *Reports_GlobalDirectory* parameter in Setup->Settings.



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These can be copied from where the installation lays them down in the following directory: C:\Program Files (x86)\Common Files\FeneTech Shared\Labels\NFRCEnergyStar.

The manufacturer will download the ratings from NFRC. These will be placed into a lookup table in CORE. Then via attributes, the system will select the correct values from the lookup table to place on the label and optionally elsewhere such as the order acknowledgement and options wizard in Web Center.

Lookup Tables

A separate lookup table will be created for every product that has passed the NFRC Ratings. Create a lookup table for each excel spreadsheet provided by the manufacturer. The lookup tables are to be named "NFRC-SH", "NFRC-PW", etc. All with the NFRC prefix. Note that in some cases, a single "NFRC" lookup table may make more sense. This depends on the amount of ratings per window type and the manageability of the resulting lookup tables.

Look at the values returned to determine which criteria are needed to make a unique row for every permutation. For example, the following are typical criteria required to build up the unique code: Glass Thickness, Air Fill, Grids (Regular Grids and SDL Grids), Glass Type (including Glass Tints), Foam Filled. Review the list of differentiators with the manufacturer for approval before proceeding. Especially if it looks like effort can be reduced. For example, all units get gas fill and may be removed as a factor. Look at the existing attribute configuration to see if the IG buildup is already being returned. If it is, see if that can be used.

Within the table, column values will be the NFRC codes. Most of the time, the data type for these column values will be strings. The row values are often glass buildups, which are configured by a glass buildup attribute.



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ROW	COL	SHGC	U-factor	VT
SUW-K-15-0020...		0.45	0.3	0.54
SUW-K-15-0020...		0.41	0.3	0.49
SUW-K-15-0020...		0.41	0.3	0.49
SUW-K-15-0020...		0.45	0.27	0.54
SUW-K-15-0020...		0.41	0.27	0.49
SUW-K-15-0020...		0.41	0.27	0.49
SUW-K-15-0021...		0.43	0.25	0.53
SUW-K-15-0021...		0.39	0.25	0.48
SUW-K-15-0021...		0.39	0.25	0.48
SUW-K-15-0021...		0.43	0.23	0.53
SUW-K-15-0021...		0.39	0.23	0.48
SUW-K-15-0021...		0.39	0.23	0.48
SUW-K-15-0021...		0.26	0.29	0.48
SUW-K-15-0021...		0.24	0.29	0.43
SUW-K-15-0021...		0.24	0.29	0.43
SUW-K-15-0021...		0.26	0.26	0.48
SUW-K-15-0021...		0.24	0.26	0.43

Attributes

The next decision is if the manufacturer intends to show the NFRC values in Web Center's option wizard as a locked question and on the Order Acknowledgement or if the manufacturer only wants to generate the NFRC labels.

If the manufacturer wants to see the NFRC Ratings on the Order Acknowledgement and/or in Web's Options Wizard, a locked question will be created to show the rating values.

If the manufacturer wants to only see the NFRC Ratings on the label, then the attributes can be placed on the IG assembly in the BOM. However, the attributes are required to exist on the ordered part level for those customers that want to see the values in the Options Wizard. This adds some complexity to the calculations as windows with different types of glass in each sash are required to take the worst NFRC values for the overall window. This logic must be added to ensure the worst NFRC values for the window are returned. See the [Multi Sash Windows](#) section of this document for more information.

Based on the location in the BOM determined above, create the following attributes:

- NFRCINC – Set to 1 to include the part for NFRC ratings, if set to 0 then the part will not render a rating. NFRCINC never has to be set to 1, TRUE, or T. It defaults to 1, so it will always print a label unless NFRCINC is set to 0 somewhere within an orderable part. This makes configuration much easier.
Note: NFRCINC is not set in the interface itself. The stored procedure is hardcoded to look for an attribute named 'NFRCINC' specifically.
- NFRCALC (or NFRC) – All logic to populate the remaining attributes is calculated on this attribute.
- NFRCUF – Returns the U-Factor. Set to empty string.
- NFRCVT – Returns the Visible Transmittance. Set to empty string.
- NFRCSHGC – Returns the Solar Heat Gain Coefficient. Set to empty string.
- NFRCAL – Returns Air Leakage. Note the label will just show less than or equal to 0.3 so the actual value is not of importance.

Set these attributes to be released for production by checking them in CORE > Setup > System > Attributes > Production tab.



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In the example below, we used the IGCODE value that was already being calculated.

NFRCCALC Attribute

```
'Declare variables used in buildup codes
Dim Model As String
Dim IGCode As String
Dim Inc As Double
Dim LS As String
Dim LSIG As String
Dim KS As String
Dim KSIG As String
Dim Strength As String
Dim Foam As String
Dim Grid As String
Dim Table As String
Dim brKS As Variant
Dim brLS As Variant

'Set variables
If Attributes.Exists("MODEL") Then
    Model = Attributes("MODEL").Value
End If

If OptionExists("GLS") Then
    KSIG = Left(GroupCode("GLS KEEPER SASH"), Len(GroupCode("GLS KEEPER SASH")) - 1)
    LSIG = Left(GroupCode("GLS LOCK SASH"), Len(GroupCode("GLS LOCK SASH")) - 1)
Else
    IGCode = GroupCode("GLASS")
End If

'Put Strength code here SS/DS

If OptionExistsOR("DS, DSC") Then
    Strength = "DS"
Elseif KSIG = "BLDPN" Or LSIG = "BLDPN" Then
    Strength = ""
Elseif KSIG = "OBTP" Or KSIG = "LEOBT" Or KSIG = "CLTP" Or KSIG = "CLLET" Then
    Strength = "DS"
Elseif LSIG = "OBTP" Or LSIG = "LEOBT" Or LSIG = "CLTP" Or LSIG = "CLLET" Then
    Strength = "DS"
Elseif IGCode = "OBTP" Or IGCode = "LEOBT" Or IGCode = "CLTP" Or IGCode = "CLLET" Then
    Strength = "DS"
Elseif Attributes("MODEL").Value = "PD400" Then
```



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```
Strength= ""
Else
  Strength = "SS"
End If

'Put Foam code here FM/NF

Prod = Left(Model, 2)
Foam = "NF"
If Prod = "DH" or Prod = "SH" Or Prod = "SL" Then
  If OptionExists("FS") And OptionExists("FF") Then
    Foam = "FM"
  End If
Else
  If OptionExists("FF") Then
    Foam = "FM"
  End If
End If

'Put Grid code here GR/NG

If GroupExists("GRID MATERIAL") Then
  Grid = "GR"
Else
  Grid = "NG"
End If

'Compile Buildup Code
Table = "NFRC-" & Model

If OptionExists("GLS") Then
  KSretval = KSIG & Strength & "." & Grid & "." & Foam
  LSretval = LSIG & Strength & "." & Grid & "." & Foam

'Figure out which sash is worse

KSSHGC = TableLookup(Table, "SHGC", KSretval)
KSUF = TableLookup(Table, "UF", KSretval)
KSVT = TableLookup(Table, "VT", KSretval)
KSAL = TableLookup(Table, "AL", KSretval)
KSCR = TableLookup(Table, "CR", KSretval)
```



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```
KSSTC = TableLookup(Table, "STC", KSretval)
```

```
LSSHGC = TableLookup(Table, "SHGC", LSretval)
```

```
LSUF = TableLookup(Table, "UF", LSretval)
```

```
LSVT = TableLookup(Table, "VT", LSretval)
```

```
LSAL = TableLookup(Table, "AL", LSretval)
```

```
LSCR = TableLookup(Table, "CR", LSretval)
```

```
LSSTC = TableLookup(Table, "STC", LSretval)
```

```
brKS = 0
```

```
brLS = 0
```

```
'Code to determine which SHGC is worse, and to assign the SHGC attribute to the worst value
```

```
If KSSHGC = "" And LSSHGC = "" Then
```

```
    brKS += 1
```

```
Elseif (KSSHGC <> "" And LSSHGC = "") Or (KSSHGC <> "" And LSSHGC <> "" And KSSHGC >= LSSHGC) Then
```

```
    brKS += 1
```

```
Elseif (KSSHGC = "" And LSSHGC <> "") Or (KSSHGC <> "" And LSSHGC <> "" And LSSHGC >= KSSHGC) Then
```

```
    brLS += 1
```

```
End If
```

```
'Code to determine which UF is worse, and to assign the UF attribute to the worst value
```

```
If KSUF = "" And LSUF = "" Then
```

```
    brKS += 1
```

```
Elseif (KSUF <> "" And LSUF = "") Or (KSUF <> "" And LSUF <> "" And KSUF >= LSUF) Then
```

```
    brKS += 1
```

```
Elseif (KSUF = "" And LSUF <> "") Or (KSUF <> "" And LSUF <> "" And LSUF >= KSUF) Then
```

```
    brLS += 1
```

```
End If
```

```
'Code to determine which VT is worse, and to assign the VT attribute to the worst value
```

```
If KSVT = "" And LSVT = "" Then
```

```
    brKS += 1
```

```
Elseif (KSVT <> "" And LSVT = "") Or (KSVT <> "" And LSVT <> "" And KSVT <= LSVT) Then
```

```
    brKS += 1
```

```
Elseif (KSVT = "" And LSVT <> "") Or (KSVT <> "" And LSVT <> "" And LSVT <= KSVT) Then
```

```
    brLS += 1
```

```
End If
```

```
'Code to determine which AL is worse, and to assign the AL attribute to the worst value
```

```
If KSAL = "" And LSAL = "" Then
```

```
    brKS += 1
```

```
Elseif (KSAL <> "" And LSAL = "") Or (KSAL <> "" And LSAL <> "" And KSAL >= LSAL) Then
```



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```
brKS += 1
Elseif (KSAL = "" And LSAL <> "") Or (KSAL <> "" And LSAL <> "" And LSAL >= KSAL) Then
brLS += 1
End If

'Code to determine which CR is worse, and to assign the CR attribute to the worst value
If KSCR = "" And LSCR = "" Then
brKS += 1
Elseif (KSCR <> "" And LSCR = "") Or (KSCR <> "" And LSCR <> "" And KSCR <= LSCR) Then
brKS += 1
Elseif (KSCR = "" And LSCR <> "") Or (KSCR <> "" And LSCR <> "" And LSCR <= KSCR) Then
brLS += 1
End If

'Code to determine which STC is worse, and to assign the STC attribute to the worst value
If KSSTC = "" And LSSTC = "" Then
brKS += 1
Elseif (KSSTC <> "" And LSSTC = "") Or (KSSTC <> "" And LSSTC <> "" And KSSTC >= LSSTC) Then
brKS += 1
Elseif (KSSTC = "" And LSSTC <> "") Or (KSSTC <> "" And LSSTC <> "" And LSSTC >= KSSTC) Then
Attributes("NFRCCSTC").Value = LSSTC
End If

'Chose which sash has the most bad ratings and return those
If brKS >= brLS Then
Attributes("NFRCSHG").Value = KSSHGC
Attributes("NFRCUF").Value = KSUF
Attributes("NFRCVT").Value = KSVT
Attributes("NFRCAL").Value = KSAL
Attributes("NFRCCR").Value = KSCR
Attributes("NFRCCSTC").Value = LSSTC
Attributes("NFRCCPD").Value = TableLookup(Table, "CPD", KSretval)
Else
Attributes("NFRCSHG").Value = LSSHGC
Attributes("NFRCUF").Value = LSUF
Attributes("NFRCVT").Value = LSVT
Attributes("NFRCAL").Value = LSAL
Attributes("NFRCCR").Value = LSCR
Attributes("NFRCCSTC").Value = LSSTC
Attributes("NFRCCPD").Value = TableLookup(Table, "CPD", LSretval)
End If

retval = KSretval & "-" & LSretval
```



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Else

```
retval = IGCode & Strength & "." & Grid & "." & Foam
```

'Assign values for NFRC label from LookupTable

```
Attributes("NFRCSHGC").Value = TableLookup(Table, "SHGC", retval)
```

```
Attributes("NFRCUF").Value = TableLookup(Table, "UF", retval)
```

```
Attributes("NFRCVT").Value = TableLookup(Table, "VT", retval)
```

```
Attributes("NFRCAL").Value = TableLookup(Table, "AL", retval)
```

```
Attributes("NFRCCR").Value = TableLookup(Table, "CR", retval)
```

```
Attributes("NFRSTC").Value = TableLookup(Table, "STC", retval)
```

```
Attributes("NFRCCPD").Value = TableLookup(Table, "CPD", retval)
```

End If



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Multi Sash Windows

There are instances where an ordered product will return multiple CPD numbers due to different glass and grid configurations in different sashes. In this scenario **the CPD number record with the worst ratings must be used**. Ratings cannot be mixed from different CPD numbers. All ratings from the CPD row with the worst values must be returned as the product's ratings.

The following criteria should be used to determine which CPD record has the worst ratings between the applicable ratings for the product. The worst CPD row will have:

- Highest U Factor
- Highest SHGC
- Lowest VT

For example, if the following ratings are returned for the LS and KS of a double hung window, the KS ratings should be returned for the product. The KS has a higher U Factor and higher SHGC resulting in 2/3 metrics being worse for the KS.

	CPD	RAL	RCR	RSHG	RUF	RVT
LS	081-00002	0.09	60	0.2	0.29	0.46
KS	105-00003	0.09	46	0.51	0.45	0.49

In a scenario where 2 of the 3 criteria are not worse on one sash, the sash with the highest U Factor should be used. If the U Factor is the same, the sash with the highest SHGC should be used. If the U Factor and the SHGC are the same, then the sash with the lowest VT should be used. In the example below, the LS ratings should be used for the product since the U Factors are identical and the SHGC is higher on the LS.

	CPD	RAL	RCR	RSHG	RUF	RVT
LS	09-00001	0.09	45	0.14	0.24	0.3
KS	09-00002	0.09	45	0.13	0.24	0.26

Option Setup

If displaying the NFRC ratings in the Options Wizard is required, an NFRC option code will need to be added in the Option Code Setup screen. This code will be the "master" option code to return the NFRC values as a parsed string. For this example, the option code is named "NFRC", but it can be tailored to each customer's needs.

Once the NFRC option code has been created, it must be added to a question in a part's option structure. For ease of setup, it is best to have the NFRC option code underneath a system question. Once the question has been created and configured, it can easily be dragged to any part that will display NFRC ratings. The newly created system question should have the following settings:

Question: NFRC VALUES

<input checked="" type="checkbox"/> Allow Multiple Selections	Key:	<input type="text"/>
<input type="radio"/> Require that an option be selected.		<input type="checkbox"/> Resets CAD
<input checked="" type="radio"/> Allow {None} to be selected.		<input type="checkbox"/> Resets Grid Designer
<input checked="" type="checkbox"/> Visible Expression <input type="text"/>	<input checked="" type="checkbox"/> Locked	<input type="checkbox"/> Supports Tiled Layout



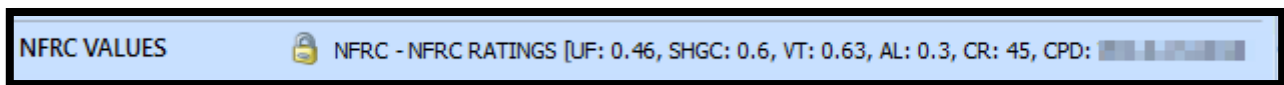
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Once the NFRC option code has been dragged under the question, the option should have the following settings:

Option Code Default Value Scripting

The default value script is what allows the value of the option code to be dynamically calculated depending on what other options are selected that affect the NFRC ratings of the glass. Within the default value scripting, the buildup of the glass would need to be calculated, like how a glass buildup attribute would operate.

The NFRCALC (or NFRC) attribute can be used here to return the values that should be displayed. The return value from this attribute is not used elsewhere as it simply sets the other attributes. The final return value will return something like this in the options wizard:



NFRC Interface Screen Setup

Once the values have been confirmed for all the attributes are being returned via a part breakdown, go to the NFRC Interface Setup, and map the attributes/parts to generate the production label.

Company Information

1. Name (Required) – Company name as they want it to appear on the NFRC Label
2. Phone Number (Optional) – Company phone number
3. Manufacturer's ID (Required) – ID supplied by NFRC. Either the company name or Manufacturer's ID is required for a valid label.



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Other

4. Default Printer – The printer to use if printing from the Schedule Maintenance screen.
 - If no printer for labels is specified, the printer at the Wrapper station will be the default printer, no extra configuration required in Tracking.

Other Attributes (Optional either use the grid with the ‘Technical information’ or the attributes)

5. Part Number - This field value is the name of an attribute that specifies a part number. This should only be used to designate a part number for each unit within a multi-unit (an orderable part that contains more than one unit, such as a twin double hung). If this attribute is not specified for a unit within a multi-unit, that unit’s part number will default to the orderable part’s part number.
6. Part Description - This field value is the name of an attribute that specifies a part description. This should only be used to designate a part description for each unit within a multi-unit (an orderable part that contains more than one unit, such as a twin double hung). If this attribute is not specified for a unit within a multi-unit, that unit’s part description will default to the orderable part’s part description.
7. Product Type - This field value is the name of an attribute that specifies a product type. This should only be used to designate a product type for each unit within a multi-unit (an orderable part that contains more than one unit, such as a twin double hung). If this attribute is not specified for a unit within a multi-unit, that unit’s product type will default to the orderable part’s product type.
8. Show Air Leakage – This field value determines if Air Leakage is included on the label. It must have an attribute selected. NFRINC is a possible choice since it is already configured, and its use will always show air leakage on any part that receives a label.

Detailed Information

The following two sections can be sent to the customer to complete the configuration of their projects. If the rest of this document is not customer facing, these sections still are.

Technical Information (Top Grid)

This section of the NFRC Setup screen is used to map NFRC Part types to Parts and identify which parts should generate NFRC labels.

Note: The NFRINC Attribute also determines if a part should generate a NFRC Label.

Configure parts that will generate a label with the following information:

1. Confirm the part is unchecked. The checkbox is an “Exclude” checkbox.
2. Enter an Alternate Description if required. Otherwise, the part description in the system will be used.
3. Select a Category from the dropdown list.
 - a. This is required to determine which EnergyStar Zone table is used. Based on the category selected, the product ratings are compared to respective EnergyStar tables to determine which regions (possibly one or more) the product is EnergyStar certified. A composite map will be generated if the product is certified in more than one region.
4. Select a Product Type from the dropdown List.
 - a. This is required for the 2023 standard reporting requirements.
5. The CPD Number column should be left empty as a typical implementation will use a global CPD Number attribute.
 - a. A valid CPD Number has a maximum length of seventeen characters and in the form ABC-X-001-123-456:
 - i. ABC is the manufacturer alpha code
 - ii. X is the IA identifier
 - iii. 001 is the product line number
 - iv. 123 is the individual product line number



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- v. 456 is the SHGC line number

Window Options (Bottom Grid)

This section is used to map Options to the NFRC Label. Required options are Frame Material, Glazing Type, and Gas Fill/Low E (if applicable). All other information is optional such as Air Space Width, Spacer Type, Glazing Tint, or Reflecting Coating.

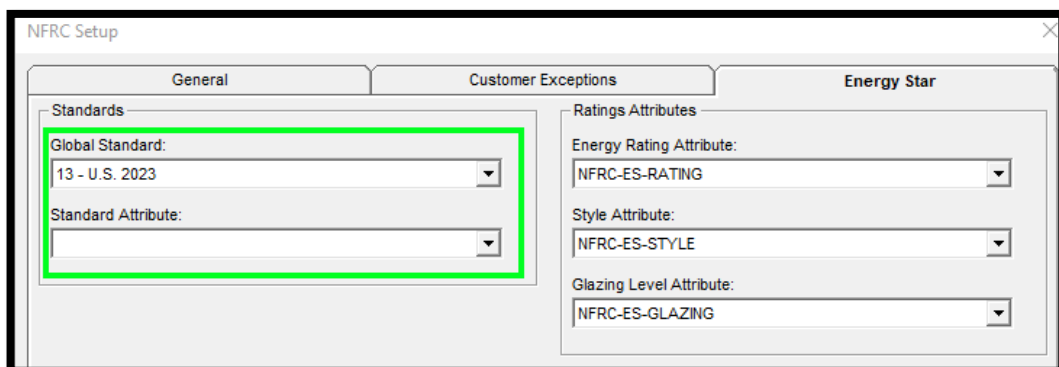
Configure options from each tab to appear on the label:

1. Find the option in the appropriate tab and check it. Tab away and now it will appear at the top of the list.
 - a. The option tabs are there to help keep track of which options apply to their corresponding information on the NFRC label. Therefore, it is not necessary to place frame material under the *Frame Material* tab.
 - i. In fact, all options can be placed under one tab. Just remember to move those options up to the top of the list if those should be printed first on the NFRC label.
2. Add an Alternate Description for the options, as needed.
3. Examples
 - a. Frame Material – Vinyl Frame
 - b. Glazing Type – Single Glazing, Double Glazing, Triple Glazing
 - c. Gas Fill/ Low E – Argon, Krypton, Low-E
4. Re-organize the options in the list by highlighting an option and press the up and down buttons. When options are printed out on the NFRC label, their order of printing is specified by their placement in this grid. All items in the *Frame Material* tab will be printed before those under the *Glazing Type* tab, which will print before those in *Gas Fill/Low E*, which will print before those in *Other*. Within each tab, the options at the top will print first.

If an option does not exist or cannot be purposed for this, then an attribute can be selected at the bottom of the screen. Once an attribute is selected, it will be added to the grid underneath the currently selected tab. Whenever this attribute is defined within the BOM for an orderable part, or any of its subassemblies, its value will be displayed on the NFRC label for that ordered part. When an attribute is selected, the description field for the attribute will read “[Attribute Value]”. No alternate description may be typed in for an attribute.

EnergyStar Tab

EnergyStar rating compliance will add a Map to the NFRC label. One label will still print for both purposes. For NFRC labels to print, select the most current EnergyStar selection in the menu. As of July 2023, the 13 - <Country> - 2023 standard is the most current. Even if EnergyStar is not being fully configured, this selection is required for the NFRC label to print. It cannot be blank.





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Label Images

The EnergyStar Image needs to be available for the printer. Confirm the images are in the following location:

[C:\Program Files \(x86\)\Common Files\Fenetech Shared\Labels\NFRCEnergyStar](C:\Program Files (x86)\Common Files\Fenetech Shared\Labels\NFRCEnergyStar)

Note: This directory could be slightly different depending on the configuration of the customer's *Reports_GlobalDirectory* GSP.

ZPL Label Customizations

The following tags are available:

6. !CNAME! – Company Name
7. !PHONENUM! - Company phone number
8. !MFGID! –Manufacturer's ID
9. !PARTNO! – Part Number
10. !PARTDESC! – Part Description
11. !PRODUCTTYPE! – Product Type
12. !ONUMBER! – Order Number
13. !OITEM! – Line Item Number
14. !BATCHID! – Batch ID
15. !SCHEDID! – Schedule ID
16. !BIN! - Bin
17. !UNITID! – Unit ID
18. !STATIONID! – Station ID (the current station that scanned the part)
19. !DATETIME! – The current time
20. !USERDEF1! – UserDef1 as specified in the NFRC setup dialog
21. !USERDEF2! – UserDef2 as specified in the NFRC setup dialog
22. !USERDEF3! – UserDef3 as specified in the NFRC setup dialog
23. !USERDEF4! – UserDef4 as specified in the NFRC setup dialog
24. !USERDEF5! – UserDef5 as specified in the NFRC setup dialog
25. !USERDEF6! – UserDef6 as specified in the NFRC setup dialog
26. !CPDNO! – CPD Number
27. !RESUF! – U-Factor rating
28. !RESSHG! – Solar Heat Gain Coefficient rating
29. !RESVT! – Visible Transmittance rating
30. !RESAL! – Air Leakage rating
31. !OPTIONS! – A bullet delimited list of options
32. !SPEC! – The NFRC Ratings Specification. Either blank or RES97.
33. !NFRCCUSTOM1! – The value of the NFRCCUSTOM1 attribute
 - o All attribute values from NFRCCUSTOM2 thru NFRCCUSTOM24
34. !NFRCCUSTOM25! – The value of the NFRCCUSTOM25 attribute

Updated 2023 Standards

2023 Label Changes

NFRC has released new 2023 standards with changes to the EnergyStar zones and label modifications. They have also included a requirement for reporting on the number of labels printed. The images below illustrate the new label changes.

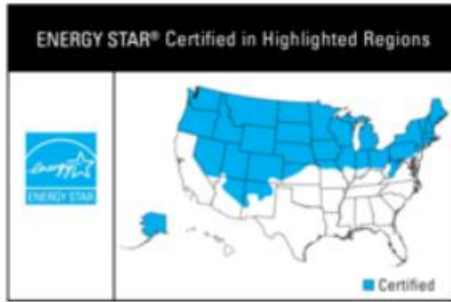


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New Label Format

Current V6 Product Label



New V7 Product Label



Zone changes based on IECC 2021
- with adjusted zone islands



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Climate Zone Map Changes

Current Climate Zones



New Climate Zones



Zone changes based on IECC 2021
- with adjusted zone islands



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Users of NFRC in 2023 are also required to report to the EPA the number of products they have shipped each year for each product type and EnergyStar climate zone. It is critical that the product type and category settings are configured in NFRC setup to ensure the manufacturers are in compliance of this reporting requirement. The image below shows a sample form that manufacturers must submit to the EPA annually.

Reporting Period: Calendar Year 2023 (Jan. 1 to Dec. 31)	2023	2023
	ENERGY STAR U.S. Unit Shipments	Total* U.S. Unit Shipments (ENERGY STAR + Non-ENERGY STAR within scope)
Window Product Type		
Northern Zone Window Products		
North-Central Zone Window Products		
South-Central Zone Window Products		
Southern Zone Window Products		
Total ES Windows	0	0

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Deploying 2023 Changes for Existing NFRC Users

This section is only required if deploying a hotfix for the 2023 standards on a server where a previous standard of NFRC is already configured. There are hotfix files for different versions of FV in the below BlueMine tickets.

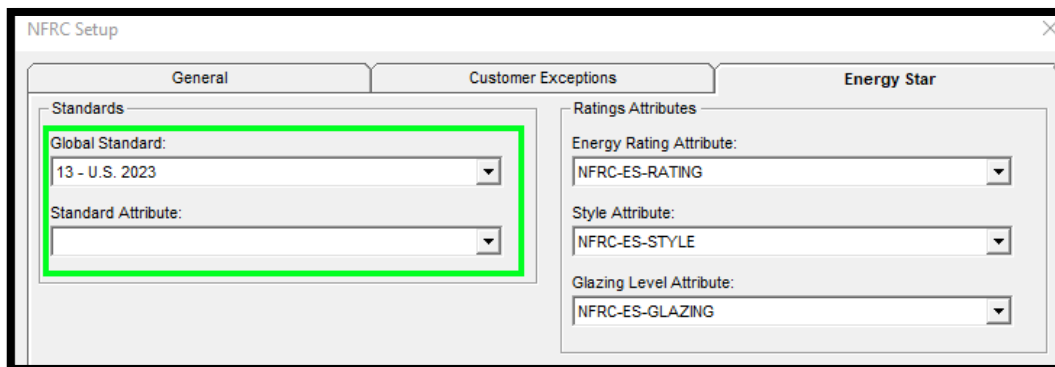
- [Updated NFRC/EnergyStar labels to meet 2023 standard criteria](#)
- [Add reporting capability for new NFRC/Energy Star ratings](#)

Deploying the hotfix on existing servers consists of a few configuration and verification tasks.

1. Backup existing ZPL directory
 - a. The *NFRC EnergyStar* folder will be overwritten by the hotfix
2. Verify the Category and Product Type fields are configured in the *Technical Information* grid for all products receiving NFRC ratings.
 - a. Some users have previously used NFRC without configuring these fields. These fields are critical to staying in compliance with the new 2023 reporting requirements.

Technical Information		User Defined Information				
	Part Number	Description	Alternate Description	Category	Product Type	CPD Number
<input type="checkbox"/>	64-DH	64 Double Hung		Windows	Dual Action Window	NFRC-CPD
<input type="checkbox"/>	64-DH-STOCK					
<input type="checkbox"/>	75-DH	75 Double Hung		Windows	Dual Action Window	NFRC-CPD
<input type="checkbox"/>	INVENTORY					
<input type="checkbox"/>	NFRC-NCSCS	North-Central South-Cen		Windows	Dual Action Window	NFRC-CPD
<input type="checkbox"/>	NFRC-NORTH		North Window	Windows	Dual Action Window	NFRC-CPD
<input type="checkbox"/>	NFRC-SCS			Windows	Dual Action Window	

3. Deploy the appropriate hotfix depending on FeneVision version
 - a. Hotfix zip folders by version are located in the above BlueMine
4. Replace the EnergyStar and NFRC ZPL template files in the global reports directory with the latest templates added from the new hotfix.
 - a. These are located in the *NFRC EnergyStar* folder after running the hotfix. The file names of the new templates should match the existing file names in the global reports directory.
5. Update the *Global Standard* dropdown in the *Energy Star* tab to use the appropriate 2023 standard.



NFRC Setup

General Customer Exceptions Energy Star

Standards

Global Standard: 13 - U.S. 2023

Standard Attribute:

Ratings Attributes

Energy Rating Attribute: NFRC-ES-RATING

Style Attribute: NFRC-ES-STYLE

Glazing Level Attribute: NFRC-ES-GLAZING

6. Follow all steps in the Testing section of this document to ensure that the new 2023 labels are generated.
 - a. *TBA – Testing of reporting requirements*

Testing

Create an Order in Order Entry with a variety of products including windows with glass by sash. The worst rating needs to be returned in that situation, and the interface will do that for the manufacturer. Include products that should generate a label and ones that should not.

1. Verify the option is being displayed in Option Wizard as locked and cannot be edited.
2. After a Web publish, verify the option is being displayed in Web Option Wizard as locked and cannot be edited.



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3. Confirm the option values are being displayed on the Order Acknowledgement.
4. Validate the correct values are being returned in each case.

Set Ack Date and Release to Production. Go to the NFRC Setup Troubleshooter and enter the SCHEDID and BIN to confirm the ratings are going through.

Best practice document [BP0136-Setting up Generic Text Printer for ZPL Previewing](#) describes the steps required to preview and the a ZPL label.

Provide customer with the order number and SCHEDID for them to review and print labels.

Troubleshooting

Unit is not appearing in the NFRC Troubleshooter. Confirm the following:

1. Confirm the BOM by checking all required ratings are available in Order Entry Part Breakdown (NFRCINC, NFRCALC, NFRCUF, NFRCVT, and NFRCSHGC).
2. Confirm attributes are released to production.
3. Confirm minimum NFRC Setup completed:
 - a. Company Info: Name or MFG ID
 - b. Attribute Mappings
 - c. Technical Information: Part unchecked. Product Type and Category selected
 - d. Options: At least one option in one tab is selected

No Label generates for the ZPL Previewer. Confirm that the required ZPL labels and images are placed here: [C:\Program Files \(x86\)\Common Files\Fenetech Shared\Labels](#)

NFRC Logo is not printing on the labels. Older printers use *dynamic* memory to store pictures, while newer printers use *static* memory to hold pictures. If the memory is dynamic, pictures will be erased from memory if the printer is restarted. If the memory is static, pictures will stay in printer memory even if the power is turned off and back on. The NFRC logo is only downloaded to the printer when the first NFRC label is printed. Therefore, if you print a label and then toggle the printer power switch, the picture will be erased if you're using dynamic memory. To resend the picture back to the printer after it has been erased, restart the Window Tracking program (you do not need to reboot the computer). To tell the printer that you wish to store an image in static memory, you must go into the NFRC template files and make small modifications. If you wish to do this, call a Fenetech support engineer.

There is a long delay when I start Window Tracking and print the first label. When the first label is printed at Window Tracking, all pictures are downloaded to the printer. Depending on the speed of the computer to printer connection, as well as the printer's ability to accept large amounts of incoming information, this may take up to a minute or two.

I want to display new information on the label. The labels that are downloaded to the printer are text-based and can be opened in Notepad. They are in the Program Files\Common Files\Fenetech Shared directory. Their names are NFRCGenTemplate.zpl and NFRCImageTemplate.zpl. To display new information on the label, you need to open NFRCGenTemplate.zpl in Notepad, and type in new information. You can either use the tags listed a few pages earlier, or type in information that you want to show on every label. To do this, you're going to need some experience using the ZPL (Zebra Programming Language), or a willingness to learn. If you want to get your hands dirty, you can download the ZPL manual from www.zebra.com, and make modifications to the label.

I would like changes I make to the NFRC label to instantly be shown at all wrapper stations. There is a general setup parameter that you can set up in CORE, *Reports_GlobalDirectory*. Once this parameter is created, its value needs to be set to a directory that is accessible to all computers on the network. For instance, [\\MyServer\Labels](#). Then, drop in the NFRCGenTemplate.zpl and NFRCImageTemplate.zpl script files. Now, all wrapper stations on the network will use the



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labels in [\\MyServer\Labels](#). If, for some reason, a computer cannot access the global directory or the script files within the directory, it will default to using the script files on the local machine (In Program Files\Common Files\Fenetech Shared).

The label is not printing out for a certain window, but it should be. Make sure that the orderable part is not checked off in the NFRC setup dialog. If it is not checked off, then make sure that an NFRCINC attribute on that part is not being set to 0.

Common Errors

- **I am not getting the correct map for my product.**
 - Ask customer to run the NFRC Troubleshooter and see if they get the same results.
 - Go to the NFRC Troubleshooter within CORE – Setup – Interfaces – NFRC.
 - Select the Troubleshoot button.
 - Enter the unit into the screen to display the rating values.
 - If the rating values do not match what the customer expected, their configuration needs to be updated to accurate values.
 - If the rating values match what the customer expected, and the map is missing, provide them with the NFRC rating link to see why it failed.
 - NFRC 2015
- https://www.energystar.gov/sites/default/files/ES_Final_V6_Residential_WDS_Spec.pdf
 - NFRC 2010
- http://www.energystar.gov/ia/partners/prod_development/archives/downloads/windows_doors/Windows_Doors_and_Skylights_Program_Requirements.pdf
 - Canada 2015 -
[https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/pdf/energystar/Fenestration%20V4_0%20\(February%202015\).pdf](https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/pdf/energystar/Fenestration%20V4_0%20(February%202015).pdf)
 - Do you have more than one printer?
 - If yes, what is different about the printer getting the wrong labels?
 - Is it a new printer?
 - Are you using the same PC to send to the printer?
 - If not, confirm the Reports_GlobalDirectory can be reached by the station printing the label, the label templates exist, and have not been changed recently. If the directory cannot be reached, then the PC will use locally stored templates. If there is a new PC a local copy of the template may have been stored on the PC.
 - Are you setting up a new printer/PC?
 - If yes, confirm which templates are being used.
 - Reboot the PC and the printer.
 - If the printer is having issues loading all of the templates, changing the flash memory settings in the templates can resolve it. Provide instructions on how to change this for the customer.
 - **Background:** The "E" in ~DGE and ~XGE refers to flash memory. The "R" in ~DGR and ~XGR refers to RAM memory. The ~XG tag stores the data into memory and the ~DG tag gets the data from memory.
 - **Instructions:** The NFRC images should be saved to RAM and not flash memory. If needed, change the memory from flash to RAM, see directions below:
 - Labels will be located in C:\program files\common files\fenetech shared\ or saved in the global directory, CORE – Setup – System – Options – Parameters – Reports_GlobalDirectory.
 - Backup all files.
- **Incorrect images are printing for the label or the text appears without a logo**
 - Do you have more than one printer?
 - If yes, what is different about the printer getting the wrong labels?
 - Is it a new printer?
 - Are you using the same PC to send to the printer?
 - If not, confirm the Reports_GlobalDirectory can be reached by the station printing the label, the label templates exist, and have not been changed recently. If the directory cannot be reached, then the PC will use locally stored templates. If there is a new PC a local copy of the template may have been stored on the PC.
 - Are you setting up a new printer/PC?
 - If yes, confirm which templates are being used.
 - Reboot the PC and the printer.
 - If the printer is having issues loading all of the templates, changing the flash memory settings in the templates can resolve it. Provide instructions on how to change this for the customer.
 - **Background:** The "E" in ~DGE and ~XGE refers to flash memory. The "R" in ~DGR and ~XGR refers to RAM memory. The ~XG tag stores the data into memory and the ~DG tag gets the data from memory.
 - **Instructions:** The NFRC images should be saved to RAM and not flash memory. If needed, change the memory from flash to RAM, see directions below:
 - Labels will be located in C:\program files\common files\fenetech shared\ or saved in the global directory, CORE – Setup – System – Options – Parameters – Reports_GlobalDirectory.
 - Backup all files.



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- Update the following files by replacing all instances of ~DGE with ~DGR:
NFRCImageTemplate.zpl, EStarImageTemplate.zpl.
- Update the following files by replacing all instances of ^XGE with ^XGR: NFRCGenTemplate.zpl and EStarTemplate.zpl.
- Restart the PC and the printer.
- Print the label.
- **No map is generating after switching to US 2015 global standard (or higher standard).**
 - Confirm the Air Leakage (AL) and Show Air Leakage attributes are setup and returning a value. The Air Leakage attribute is required in 2015 and higher in order to get a map. If the customer always plans to show the Air Leakage (AL) = < .3 for all qualified parts, set NFRCINC = Show AL in NFRC Setup screen. Both attributes need to be set for production and will be applied to all schedules released after the configuration change. (NOTE: The Air Leakage attribute must return a NUMBER, the system tacks on the symbol for the label.)
 - If AL attribute set as string <= .3, need to change to be 0.3.
 - Update production database for affected schedules: UPDATE ProdCustomDetails SET ParamValue2 = '.3' WHERE ParamText = 'RAL'
 - You may have to debug stored procedure usp_interfacesNFRCEnergyStar
- **Strikethrough line appears through the AL value, after switching to NFRC 2015/2016**
 - Indicates a dll registration issue or the 2015/2016 dll is not even installed on the station. Follow the steps listed in this guide under the error message: "System.Exception: FtNFRCEnergyStar.CNFRCEnergyStars à System.Exception: Cannot create ActiveX component". In addition you may need to complete the following steps:
 - Search the hard drive for any extra copies of FtNFRCEnergyStar.dll. Delete extras.
 - Unregister the FtNFRCEnergyStar.dll located in program files (x86)\fenetech shared folder.
 - Reboot computer.
 - Uninstall all FeneTech applications.
 - Delete any remaining FeneTech files on the computer under program files.
 - Install Application
 - Copy the NFRC 2015 FtNFRCEnergyStar.dll to program files (x86)\fenetech shared folder.
 - Register it. Right click on the provided bat file to register the dll, and then select run as administrator.
- **What are valid Door product types in NFRC?**
 - "Sliding Doors" and "Swinging Doors" are the only supported values for doors for the Product Type field in NFRC setup.
- **Request for approved Zebra printers for printing labels.**
 - Provide the Hardware requirements information from the FeneTech Hardware and Software Requirements document located in SharePoint – Products – Documentation.
 - The following choices are up to the customer:
Direct thermal or thermal transfer
Label cutters / peelers
Network adaptor / USB / Printer cable connectivity
- **Error: "System.Exception: FtNFRCEnergyStar.CNFRCEnergyStars à System.Exception: Cannot create ActiveX component** when I try to print labels or open NFRC Setup.
 - **Resolution:** Confirm correct version of FtNFRCEnergyStar.dll is in C:\Program Files (x86)\Common Files\Fenetech Shared by comparing to a PC that is working or checking the customer's install folder for custom dll's.
 - Re-register the dll by either double clicking on the dll, or using the register.bat file. Right click on the register.bat file and select Run As Administrator.



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- If receive the following error while registering the batch file: dllRegisterServer failed with error code 0x80004005, either a FeneTech application is open or the user account does not have admin privileges on the PC.
- **Error: "CNFRC:GatherNFRCData: The following error condition occurred: Item cannot be found in the collection corresponding to the requested name or ordinal."** when I scan a unit complete.
 - **Resolution:** Confirm correct version of FtNFRCEnergyStar.dll is in C:\Program Files (x86)\Common Files\Fenotech Shared by comparing to a PC that is working or checking the customer's install folder for custom dll's.
 - Re-register the dll by either double clicking on the dll, or using the register.bat file. Right click on the register.bat file and select Run As Administrator.
 - If receive the following error while registering the batch file: dllRegisterServer failed with error code 0x80004005, either a FeneTech application is open or the user account does not have admin privileges on the PC.
- **Error: "The following error condition occurred: Description: Numeric UF, SHGC and VT values were not all found on the same level in the BOM. This is a configuration error."** NFRC troubleshooter gives this error, but the attributes show in part breakdown.
 - **Resolution:** Confirm all attributes exist in the production database. If the attribute was added after the production database was created, the label will generate on future releases.
 - **Resolution for multi-sash units, including continuous frame units:** Make sure each sash/IG has a unique bin number, which is set in a bin attribute on the subassembly.
 - You may need to debug usp_interfacesNFRC which is the stored proc that generates this error.
- **Error: CNFRC.GenerateScriptLabel: The data validation routine has found the following error(s) pertaining to the following unit: Schedule: XX | Unit: X | Bin: X Product Type evaluated to Empty String** when printing NFRC labels.
 - **Resolution:** The Product Type was never specified for this unit, or an attribute value was not set. The customer needs to go to NFRC Setup for this part and configure the Product Type column.
- **Error: CPD number was not found on the same level as rating values in the BOM. This is a configuration error.**
 - If this occurs after a software update occurs, check for a blank record in the NFRC table, the companyname is blank: delete from nfrc where companyname = ". If this is observed, inform management as this should be resolved and indicates an issue with the upgrade scripts used by the upgrade utility still exists.
 - Otherwise have the customer check their NFRC configuration for one of the following issues:
 - CPD number is missing,
 - CPD number and/or other attributes are in multiple levels of the BOM (and the values might not be identical),
 - CPD attribute is not assigned in NFRC setup (either in upper right corner or on the part in the grid).
- **Error: CLabels: Initialize. The following error condition occurred: Description: Automation error. ClassFactory cannot supply requested class.**
 - Confirm the correct version of FtNFRCEnergyStar.dll is in the Fenotech Shared folder, and register it.
- **Error: The following error condition occurred: Description: Item cannot be found in the collection corresponding to the requested name or ordinal.**
 - Confirm the correct version of FtNFRCEnergyStar.dll is in the Fenotech Shared folder, and register it.
- **Error: Object variable or with block variable not set.**
 - Confirm the correct version of FtNFRCEnergyStar.dll is in the Fenotech Shared folder, and register it
- **CPD number printed on label is the name of the CPD attribute in NFRC Setup.**
 - For example, CPD attribute is named NFRCCPD, and the label shows NFRCCPD for the CPD number. For the given ordered part, the CPDNumber field in NFRCParts table will be NFRCCPD and CPDIsAttr is erroneously set to 0. Make sure field CPDIsAttr in NFRCParts table = 1, which means the value in the CPDNumber field is an attribute.



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- **The NFRC label is not printing on the full label.** Only a part of the label (media) is being used. For example, the label starts 2 inches from the left and does not print the second half of the label.
 - **Solution:** Recalibrate the printer's media. Printer Preferences > Advanced Setup > Selection "Action" and "Calibrate Media".