Instructions for Scanning Articles

To access the article scanning page follow the following link:

http://plasticphotovoltaics.com/lifetime-predictor/lit-scanner/scanner.html

1. Starting

1.1. Click on the word "Article" to start the scanning

1.2. Click on the article title, extract the article and make a quick review (recommended to scan abstract, conclusions and stability data in the article) to assess the relevance of the article.

1.3. Choose one of the following options:
- No data, close article: Used only if the article is discussing stability of OPVs, but **NO stability measurements are performed or data are presented**. **OPVs are defined by active layer containing only organic materials**.
- Article not relevant: is used only if the article **does not discuss stability of OPVs** (may still generally discuss OPVs) or discusses other technologies (examples are DSSC, FETs, OLEDs etc.)
- Skip: is used to skip over the article without any handling. Article goes back to the database of unhandled articles
- If the article contains stability data then proceed to step 1.4

1.4. Right click on "Article" and save the address. This link will allow retrieving the work again any time (the same technique can be used to recommend the article to a colleague by forwarding the saved link).

1.5. Proceed with detailed analyzes of stability data according to the protocol steps from 2 to 8.

1.6. Save the work using one of the following options:
- Use "Save and add extra data", if the article contains more than one stability data. Create individual pages for each stability data.
- Use "Save and close article" when all the data is filled and no further actions is required for the article.

1.7 Use "Recently scanned" tab to retrieve the scanned work for any revisions/additions

1.8 Save the PDF of all the scanned articles that contain lifetime data to be later provided to the coordinators

2. Rating

2.1. After quick scanning of the article rate it according to the scale below (it is recommended that you recheck & adjust the rating after you inserted all the entries and before saving the work):

> ➢ Poor: Data unreliable/probably unusable
> ➢ Mediocre: Poor, but can be used
> ➢ Good: Useful, but can lack statistics
> ➢ Excellent: Excellent statistics, outstanding work

Note
- Article may contain both poor and good data. Rate the article according to the best data presented.

3. General

3.1. Choose the type of the samples studied (If "others" chosen, describe in the comments)
3.2. Choose the type of the photoactive material
3.3. Choose the architecture of the layer stacking

4. Structure Info

4.1. Insert all the layers of the sample. If the material name is not found in the list, use the "add" to insert new materials.

Note
- If too many devices or films are presented in one article, explain in "Structure comments" how many & which category and leave structure info blank.
- The thickness of the back electrode is critical for stability. Make sure to scan the article for thickness values (typically in the experimental section).

5. Encapsulation

5.1. Insert the details of encapsulation and the materials used for encapsulation. If the materials for encapsulation or adhesive are not found in the list, choose others and describe in the "Encapsulation Comments" using the following format:

> **Standard Expressions**
>
> Details for Encapsulation Material [*your comment here*]
> Details for Adhesive: [*your comment here*]

5.2. Scan the article for water vapour transmission rates and oxygen transmission rates and if given state those in the "Encapsulation Comments" using the following format:

> **Standard Expressions**
>
> Water Vapor Transmission Rate: *value here* [*unit here*]
> Oxygen Transmission Rate: *value here* [*unit here*]

6. Data

6.1. Use "." as decimal separator in all the number entries

6.2. Identify if the stability data are relative or absolute values.

6.3. If the stability data is presented with relative values then perform this step, otherwise proceed to the next step. Scan the entire article and identify if the initial absolute values of the sample performance are provided and use these values to recalculate the stability data (use % for PCE, mA/cm2 for Jsc, V for Voc and % for FF). Always insert the current density and not the current if possible. If no absolute values are found, then choose "Ageing indicator" with "(r)"

6.4. If an ageing indicator different from the list is used, choose others and describe in the "Data

Comments"

6.5. Use figure 1 to identify the category of stability curves and analyze the curves accordingly using the instructions 6.6 to 6.11 (if all PV parameters are given with varying categories, choose PCE as defining category, if PCE not provided use Isc):

Note
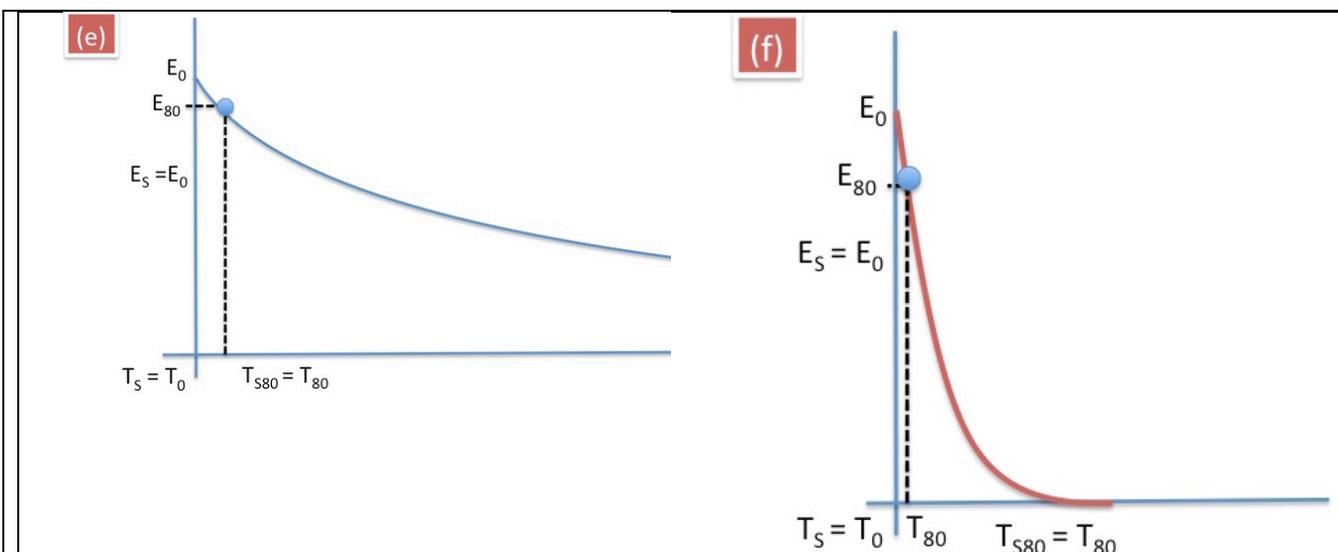- The data may represent a combination of different types of curves
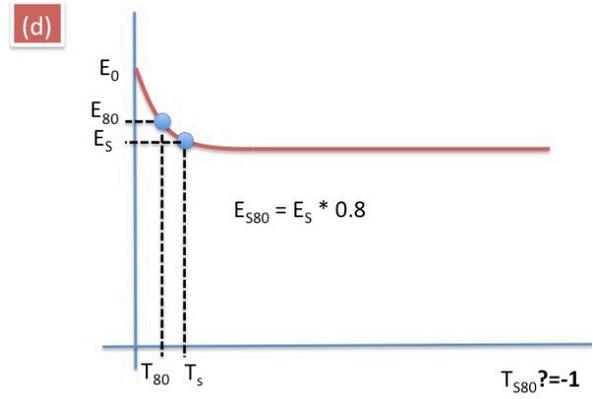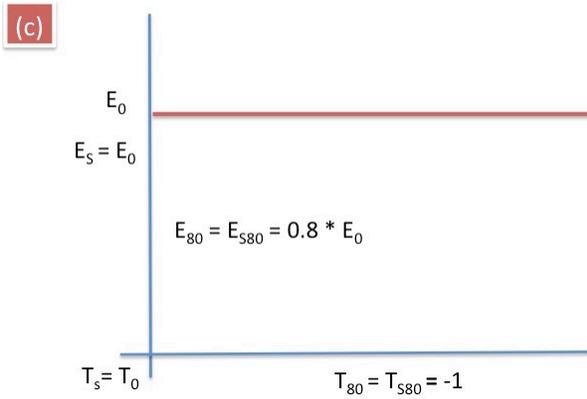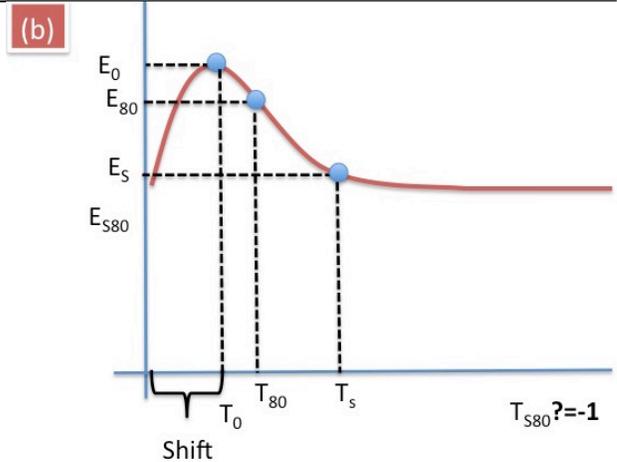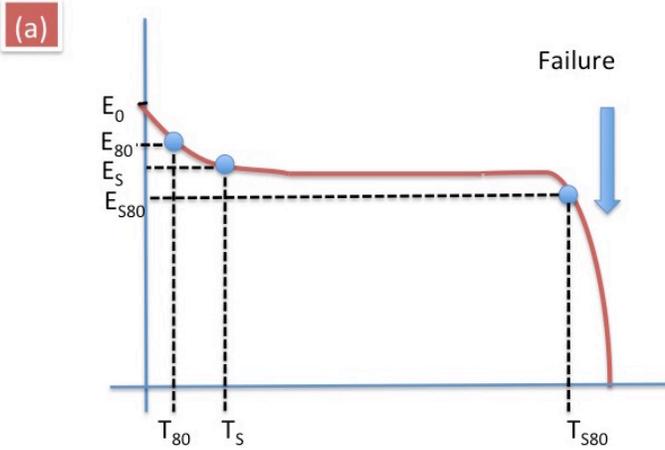
Figure 1.

	(a)	(b)	(c)	(d)	(e)	(f)
Burn in	Yes	Yes	No	Yes	Yes	Yes
Stabilized S	Yes	Yes	Yes	Yes	No	Yes
Failure	Yes	No	No	No	No	No

6.6. Insert the total test period (if the performance reaches 0 before the end of measurement, add in the comments the following comment and fill the time instead of XX)

> **Standard Expressions**
>   E reaches 0 at T [*insert value here*]

6.7. Perform this step if PV parameters are given only at certain points of time (for example initial and final values) and no stability curve is presented, otherwise go to the next step. Choose Burn in (BI) [N/A]; Stabilized Stage (SS) [N/A]; Failure (FL) [N/A]; Insert T0 and E0 only and in the "Data comments" add final values using the following format:

> **Standard Expressions**
>   E final [*insert value here*]

6.8 If the frequency of measurements is very low, such that it affects the stability data presentation (for ex. it is hard to define T80 or stabilized region), describe in "Data comments" using the following format:

6.9. Choose Yes or No for Burn in (BI), Stabilized Stage (SS) and Failure (FL) and insert T0, E0, Ts, Es, T80, E80, Ts80, Es80 according to figure 1 (see step 6.5.) and category explanations below (ignore outlying points in the curve that are obvious measurement errors)

Note
- Ts80 is calculated from Ts and not from T0. So you always need to extract Ts from the value
- If T80 or Ts80 are much larger than test period and are impossible to identify, use -1 for these values and in the comments add E final [*insert value here*]
- If more than one PV parameter is provided in the plot with different nature of decay, BI, SS and FL will only refer to PCE (if not provided then Isc)

(a) BI [Yes]; SS [Yes]; FL [Yes]; T0 = 0, E0 = E initial; Ts is between BI and SS (Ts is defined by drawing straight line on the stabilized region and identifying the point where the curve deviates from the straight line); T failure (calculated from T0) and E failure must be stated in "Data comments" using the following format (insert also type, such as "critical", "mild"):

(b) BI [Yes]; SS [Yes]; FL [No]; Shift the time scale to maximum performance E0 = Emax, T0 = Tmax,; Ts is between BI and SS (Ts is defined by drawing straight line on the stabilized region and identifying the point where the curve deviates from the straight line); The T0 true and true E0 must be stated in "Data comments" using the following format (use negative values for T0)

(c) BI [No]; SS [Yes]; FL [No]; T0 = Ts, E0 = Es; Ts80 = T80 = -1, Es80 = E80 = -1

(d) BI [Yes]; SS [Yes]; FL [No]; Ts is between BI and SS (Ts is defined by drawing straight line on the stabilized region and identifying the point where the curve deviates from the straight line)

(e) Applicable only if the burn in stage takes the dominating part of the entire curve, otherwise choose (d): BI [Yes]; SS [No]; FL [No]; Ts = T0, Es = E0; Ts80 = T80, Es80 = E80

(f) BI [No]; SS [Yes]; FL [No]; T0 = Ts, E0 = Es; If impossible to identify the exact values of Ts80 =

T80, then use a range entry "< XX"

6.10. In "Data comments" state how many samples were tested using the following format:

Standard Expressions
Average of [*insert value here*] samples

6.11. In "Data comments" state the type of BI (for ex. Peaking; Fast Decrease; Slow Decrease) using the following format:

Standard Expressions
Burn in type [*insert text here*]

6.12. If the timescale of decay data is given in the logarithmic scale then insert:
1. Total test period
2. Choose Burn in (BI) [N/A]; Stabilized Stage (SS) [N/A]; Failure (FL) [N/A]; Insert E0 and T80 and E80 and in the "Data comments" add final values using the following format:

Standard Expressions
E final [*insert value here*]

7. Conditions

7.1. Scan the article for all the details related to testing conditions.

7.2. Choose the testing conditions

7.3.

7.4. Insert intensity value in W/m2 units if provided in the article. Insert 0 if tested in dark or -1 if not provided.

7.5. Insert sample temperature and surrounding humidity if provided in the article. If not available, insert -1.

> *Note*
> - If samples is tested in dark in room environment, use "room" for temperature
> - Do not use room temperature when samples is tested under simulated light source

7.6. Insert relative humidity if provided in the article. If not available, insert -1.

> *Note*
> - If samples is tested in dark in room environment, use "room" for humidity
> - Do not use room relative humidity when samples is tested under simulated light source

7.7. Insert light source type used for ageing, NOT for IV testing. If the type is not provided in the list, choose others and describe in "Conditions comments".

7.8. Identify the light spectrum from the type of the light source.

7.9. Angle is applicable only for outdoor tests, in all other cases leave blank. The angle is the sample tilt relative to earth normal. 90 degrees is chosen for solar tracker.

7.10. Search for the word "ISOS" and identify if ISOS protocols have been explicitly sited or if the testing conditions are according to or similar to the protocols. Choose the ISOS according to the search results and test conditions analyses.

8. General Comments

8.1. Scan the article and identify the main factors affecting decay of the sample proposed by the authors (e.g. humidity, oxygen, light, high temperature, mechanical stress, etc.). Use the following format to fill in that information:

> ***Standard Expressions***
>
> The main factor causing decay [*insert comment here*]

8.2. Scan the article and identify the main decay mechanisms for the sample proposed by the authors (e.g. physical, chemical, mechanical, photodegradation, etc.). Use the following format to fill in that information:

> ***Standard Expressions***
>
> The main decay mechanism [*insert comment here*]

8.3. If applicable state what was used/reported to improve the stability of the sample. Use the following format to fill in that information:

> ***Standard Expressions***
>
> What was reported to improve stability [*insert comment here*]