



# COLOUR - DATASETS

## Colour - Datasets Documentation

*Release 0.2.5*

Colour Developers

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## CONTENTS

<b>1</b>	<b>1.1</b>	<b>Features</b>	<b>3</b>
	1.1	1.1.1 Examples . . . . .	3
<b>2</b>	<b>1.2</b>	<b>User Guide</b>	<b>5</b>
	2.1	User Guide . . . . .	5
<b>3</b>	<b>1.3</b>	<b>API Reference</b>	<b>7</b>
	3.1	API Reference . . . . .	7
<b>4</b>	<b>1.4</b>	<b>Code of Conduct</b>	<b>55</b>
<b>5</b>	<b>1.5</b>	<b>Contact &amp; Social</b>	<b>57</b>
<b>6</b>	<b>1.6</b>	<b>About</b>	<b>59</b>
		<b>Bibliography</b>	<b>61</b>
		<b>Index</b>	<b>63</b>



Colour science datasets for use with [Colour](#) or any Python package manipulating colours. The datasets are hosted in [Zenodo](#) under the [Colour Science - Datasets](#) community.

It is open source and freely available under the [BSD-3-Clause](#) terms.



## 1.1 FEATURES

**Colour - Datasets** was created to overcome issues encountered frequently when trying to access or use colour science datasets:

- No straightforward ingestion path for dataset content.
- No simple loading mechanism for dataset content.
- Unavailability of the dataset, e.g. download url is down, dataset content is passed directly from hand to hand.
- No information regarding the definitive origination of the dataset.

**Colour - Datasets** offers all the above: it allows users to ingest and load colour science datasets with a single function call. The datasets information is hosted on [Zenodo](#) where the record for a dataset typically contain:

- An *urls.txt* file describing the urls to source the dataset files from.
- A copy of those files in the eventuality where the source files are not available or the content has changed without notice.
- Information about the authors, content and licensing.

When no explicit licensing information is available, the dataset adopts the **Other (Not Open)** licensing scheme, implying that assessing usage conditions is at the sole discretion of the users.

### 1.1.1.1 Examples

**Colour - Datasets** can also be used online with [Google Colab](#).

Most of the objects are available from the `colour_datasets` namespace:

```
import colour_datasets
```

The available datasets are listed with the `colour_datasets.datasets()` definition:

```
print(colour_datasets.datasets())
```

```
colour-science-datasets
=====

Datasets : 22
Synced   : 1
URL      : https://zenodo.org/communities/colour-science-datasets/

Datasets
-----
```

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```
[ ] 3269926 : Agfa IT8.7/2 Set - Marszalec (n.d.)
[ ] 3245883 : Camera Spectral Sensitivity Database - Jiang et al. (2013)
[ ] 3367463 : Constant Hue Loci Data - Hung and Berns (1995)
[ ] 3362536 : Constant Perceived-Hue Data - Ebner and Fairchild (1998)
[ ] 3270903 : Corresponding-Colour Datasets - Luo and Rhodes (1999)
[ ] 3269920 : Forest Colors - Jaaskelainen et al. (1994)
[ ] 4394536 : LUTCHI Colour Appearance Data - Luo and Rhodes (1997)
[x] 3245875 : Labsphere SRS-99-020 - Labsphere (2019)
[ ] 3269924 : Lumber Spectra - Hiltunen (n.d.)
[ ] 4051012 : Measured Commercial LED Spectra - Brendel (2020)
[ ] 3269918 : Munsell Colors Glossy (All) (Spectrofotometer Measured) - Orava (n.d.)
[ ] 3269916 : Munsell Colors Glossy (Spectrofotometer Measured) - Haanpalo (n.d.)
[ ] 3269914 : Munsell Colors Matt (AOTF Measured) - Hauta-Kasari (n.d.)
[ ] 3269912 : Munsell Colors Matt (Spectrofotometer Measured) - Hauta-Kasari (n.d.)
[ ] 3245895 : New Color Specifications for ColorChecker SG and Classic Charts - X-Rite.
↳ (2016)
[ ] 3252742 : Observer Function Database - Asano (2015)
[ ] 3269922 : Paper Spectra - Haanpalo (n.d.)
[ ] 6590768 : Physlight - Camera Spectral Sensitivity Curves - Winquist et al. (2022)
[ ] 3372171 : RAW to ACES Utility Data - Dyer et al. (2017)
[ ] 4642271 : Spectral Database of Commonly Used Cine Lighting - Karge et al. (2015)
[ ] 4297288 : Spectral Sensitivity Database - Zhao et al. (2009)
[ ] 4050598 : Spectral Upsampling Coefficient Tables - Jakob and Hanika. (2019)
```

A ticked checkbox means that the particular dataset has been synced locally. A dataset is loaded by using its unique number: 3245895:

```
print(colour_datasets.load("3245895").keys())
```

```
Pulling "New Color Specifications for ColorChecker SG and Classic Charts" record content..
↳.
Downloading "urls.txt" file: 8.19kB [00:01, 5.05kB/s]
Downloading "ColorChecker24_After_Nov2014.zip" file: 8.19kB [00:01, 6.52kB/s]
Downloading "ColorChecker24_Before_Nov2014.zip" file: 8.19kB [00:01, 7.66kB/s]
Downloading "ColorCheckerSG_After_Nov2014.zip" file: 8.19kB [00:01, 7.62kB/s]
Downloading "ColorCheckerSG_Before_Nov2014.zip" file: 8.19kB [00:00, 9.39kB/s]
Unpacking "/Users/kelsolaar/.colour-science/colour-datasets/3245895/dataset/
↳ColorCheckerSG_Before_Nov2014.zip" archive...
Unpacking "/Users/kelsolaar/.colour-science/colour-datasets/3245895/dataset/
↳ColorCheckerSG_After_Nov2014.zip" archive...
Unpacking "/Users/kelsolaar/.colour-science/colour-datasets/3245895/dataset/
↳ColorChecker24_After_Nov2014.zip" archive...
Unpacking "/Users/kelsolaar/.colour-science/colour-datasets/3245895/dataset/
↳ColorChecker24_Before_Nov2014.zip" archive...
odict_keys(['ColorChecker24 - After November 2014', 'ColorChecker24 - Before November 2014'
↳, 'ColorCheckerSG - After November 2014', 'ColorCheckerSG - Before November 2014'])
```

Alternatively, a dataset can be loaded by using its full title: *New Color Specifications for ColorChecker SG and Classic Charts - X-Rite (2016)*

```
print(colour_datasets.load("3245895").keys())
```

```
odict_keys(['ColorChecker24 - After November 2014', 'ColorChecker24 - Before November 2014'
↳, 'ColorCheckerSG - After November 2014', 'ColorCheckerSG - Before November 2014'])
```



## 1.2 USER GUIDE

### 2.1 User Guide

The user guide provides an overview of **Colour - Datasets** and explains important concepts and features, details can be found in the [API Reference](#).

#### 2.1.1 Installation Guide

##### Primary Dependencies

**Colour - Datasets** requires various dependencies in order to run:

- `python >= 3.9, < 4`
- `cachetools`
- `colour-science >= 4.3`
- `imageio >= 2, < 3`
- `numpy >= 1.22, < 2`
- `scipy >= 1.8, < 2`
- `tqdm`
- `xlrd`

##### Pypi

Once the dependencies are satisfied, **Colour - Datasets** can be installed from the [Python Package Index](#) by issuing this command in a shell:

```
pip install --user colour-datasets
```

The overall development dependencies are installed as follows:

```
pip install --user 'colour-datasets[development]'
```

## 2.1.2 Bibliography

### Indirect References

Some extra references used in the codebase but not directly part of the public api:

- [\[OpenpyxlDevelopers19\]](#)

## 1.3 API REFERENCE

### 3.1 API Reference

#### 3.1.1 Colour - Datasets

##### Datasets & Dataset Loading

##### Loading a Dataset

colour\_datasets

<code>load(dataset)</code>	Load given dataset: The dataset is pulled locally, i.e. synced if required and then its data is loaded.
----------------------------	---

colour\_datasets.load

colour\_datasets.**load**(dataset: *int* | *str*) → *Any*

Load given dataset: The dataset is pulled locally, i.e. synced if required and then its data is loaded.

##### Parameters

**dataset** (*int* | *str*) – Dataset id, i.e. the *Zenodo* record number or title.

##### Returns

Dataset data.

##### Return type

*object*

##### Examples

```
>>> len(load("3245883").keys())
28
>>> len(
...     load(
...         "Camera Spectral Sensitivity Database - " "Jiang et al. (2013)"
...     ).keys()
... )
...
28
```

##### Ancillary Objects

colour\_datasets.loaders

## DATASET\_LOADERS

Dataset loaders ids and callables.

### colour\_datasets.loaders.DATASET\_LOADERS

```
colour_datasets.loaders.DATASET_LOADERS: CanonicalMapping = CanonicalMapping({'3252742': ..., '4051012': ..., '3372171': ..., '3362536': ..., '3367463': ..., '4050598': ..., '3245883': ..., '4642271': ..., '3245875': ..., '4394536': ..., '3270903': ..., '8314702': ..., '6590768': ..., '3245895': ..., '4297288': ..., '3269912': ..., '3269914': ..., '3269916': ..., '3269918': ..., '3269920': ..., '3269922': ..., '3269924': ..., '3269926': ...})
```

Dataset loaders ids and callables.

## AbstractDatasetLoader(record)

Define the base class for a dataset loader.

### colour\_datasets.loaders.AbstractDatasetLoader

**class** colour\_datasets.loaders.**AbstractDatasetLoader**(record: [Record](#))

Bases: [ABC](#)

Define the base class for a dataset loader.

This is an [ABCMeta](#) abstract class that must be inherited by sub-classes.

The sub-classes are expected to implement the [colour\\_datasets.loaders.AbstractDatasetLoader.load\(\)](#) method that handles the syncing, parsing, conversion and return of the dataset content as a *Python* object.

#### Attributes

- [colour\\_datasets.loaders.AbstractDatasetLoader.ID](#)
- [colour\\_datasets.loaders.AbstractDatasetLoader.record](#)
- [colour\\_datasets.loaders.AbstractDatasetLoader.id](#)
- [colour\\_datasets.loaders.AbstractDatasetLoader.content](#)

#### Methods

- [colour\\_datasets.loaders.AbstractDatasetLoader.\\_\\_init\\_\\_\(\)](#)
- [colour\\_datasets.loaders.AbstractDatasetLoader.load\(\)](#)
- [colour\\_datasets.loaders.AbstractDatasetLoader.sync\(\)](#)

#### Parameters

**record** ([Record](#)) – Dataset record.

**ID:** `str` = 'Undefined'

Dataset record id, i.e. the *Zenodo* record number.

**property record:** [Record](#)

Getter property for the dataset record.

#### Returns

Dataset record.

**Return type**

`colour_datasets.Record`

**property id:** `str`

Getter property for the dataset id.

**Returns**

Dataset id.

**Return type**

`str`

**property content:** `Any`

Getter property for the dataset content.

**Returns**

Dataset content.

**Return type**

`object`

**abstract load()** → `Any`

Sync, parse, convert and return the dataset content as a *Python* object.

**Returns**

Dataset content as a *Python* object.

**Return type**

`object`

**Notes**

- Sub-classes are required to call `colour_datasets.loaders.AbstractDatasetLoader.sync()` method when they implement it, e.g. `super().sync()`.

**sync()**

Sync the dataset content, i.e. checks whether it is synced and pulls it if required.

## Datasets

`colour_datasets.loaders`

### Spectral Upsampling Coefficient Tables - Jakob and Hanika (2019)

`DatasetLoader_Jakob2019()`

Define the *Jakob and Hanika (2019) Spectral Upsampling Coefficient Tables* dataset loader.

## colour\_datasets.loaders.DatasetLoader\_Jakob2019

**class** colour\_datasets.loaders.DatasetLoader\_Jakob2019

Bases: `AbstractDatasetLoader`

Define the *Jakob and Hanika (2019) Spectral Upsampling Coefficient Tables* dataset loader.

### Attributes

- `colour_datasets.loaders.DatasetLoader_Jakob2019.ID`

### Methods

- `colour_datasets.loaders.DatasetLoader_Jakob2019.__init__()`
- `colour_datasets.loaders.DatasetLoader_Jakob2019.load()`

### References

[JH19]

**ID:** `str = '4050598'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, LUT3D_Jakob2019]`

Sync, parse, convert and return the *Jakob and Hanika (2019) Spectral Upsampling Coefficient Tables* dataset content.

#### Returns

*Jakob and Hanika (2019) Spectral Upsampling Coefficient Tables* dataset content.

#### Return type

`dict`

### Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Jakob2019()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
4
```

`build_Jakob2019([load])`

Singleton factory that builds the *Jakob and Hanika (2019) Spectral Upsampling Coefficient Tables* dataset loader.

**colour\_datasets.loaders.build\_Jakob2019**

colour\_datasets.loaders.**build\_Jakob2019**(load: *bool* = *True*) → *DatasetLoader\_Jakob2019*

Singleton factory that builds the *Jakob and Hanika (2019) Spectral Upsampling Coefficient Tables* dataset loader.

**Parameters**

**load** (*bool*) – Whether to load the dataset upon instantiation.

**Returns**

Singleton instance of the *Jakob and Hanika (2019) Spectral Upsampling Coefficient Tables* dataset loader.

**Return type**

colour\_datasets.loaders.DatasetLoader\_Jakob2019

**References**

[JH19]

**Agfa IT8.7/2 Set - Marszalec (n.d.)**

DatasetLoader_AgfaIT872Set()	Defines the <i>University of Kuopio Agfa IT8.7/2 Set</i> dataset loader.
------------------------------	--

**colour\_datasets.loaders.DatasetLoader\_AgfaIT872Set**

**class** colour\_datasets.loaders.**DatasetLoader\_AgfaIT872Set**

Bases: DatasetLoader\_KuopioUniversity

Defines the *University of Kuopio Agfa IT8.7/2 Set* dataset loader.

**Attributes**

- colour\_datasets.loaders.Agfa IT8.7/2 Set.ID
- colour\_datasets.loaders.Agfa IT8.7/2 Set.METADATA

**Methods**

- colour\_datasets.loaders.Agfa IT8.7/2 Set.\_\_init\_\_()
- colour\_datasets.loaders.Agfa IT8.7/2 Set.load()

## References

[MUniversityoKuopio]

**ID:** `str = '3269926'`

Dataset record id, i.e. the *Zenodo* record number.

**METADATA:** `ClassVar[Dict] = {('agfait872_mat', 'agfait872.mat'): ('agfa', SpectralShape(400, 700, 10), True, None)}`

Mapping of paths and `colour_datasets.loaders.kuopio.MatFileMetadata_KuopioUniversity` class instances.

<code>build_AgfaIT872Set([load])</code>	Singleton factory that the builds <i>University of Kuopio Agfa IT8.7/2 Set</i> dataset loader.
---	--

## `colour_datasets.loaders.build_AgfaIT872Set`

`colour_datasets.loaders.build_AgfaIT872Set(load: bool = True) → DatasetLoader_KuopioUniversity`  
 Singleton factory that the builds *University of Kuopio Agfa IT8.7/2 Set* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *University of Kuopio Agfa IT8.7/2 Set* dataset loader.

### Return type

*DatasetLoader\_AgfaIT872Set*

## References

[MUniversityoKuopio]

## Camera Dataset - Solomatov and Akkaynak (2023)

<code>DatasetLoader_Solomotav2023()</code>	Define the <i>Solomatov and Akkaynak (2023) Camera Dataset</i> dataset loader.
--	--

## `colour_datasets.loaders.DatasetLoader_Solomotav2023`

**class** `colour_datasets.loaders.DatasetLoader_Solomotav2023`

Bases: *AbstractDatasetLoader*

Define the *Solomatov and Akkaynak (2023) Camera Dataset* dataset loader.



## Attributes

- `colour_datasets.loaders.DatasetLoader_Solomotav2023.ID`

## Methods

- `colour_datasets.loaders.DatasetLoader_Solomotav2023.__init__()`
- `colour_datasets.loaders.DatasetLoader_Solomotav2023.load()`

## References

[]

**ID:** `str = '8314702'`

Dataset record id, i.e. the *Zenodo* record number.

**load()**  $\rightarrow$  `Dict[str, Dict[str, RGB_CameraSensitivities]]`

Sync, parse, convert and return the *Solomatov and Akkaynak (2023) Camera Dataset* dataset content.

### Returns

*Solomatov and Akkaynak (2023) Camera Dataset* dataset content.

### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Solomotav2023()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
2
>>> len(dataset.content["Estimated"].keys())
1012
```

`build_Solomotav2023([load])`

Singleton factory that builds the *Solomatov and Akkaynak (2023) Camera Dataset* dataset loader.

## `colour_datasets.loaders.build_Solomotav2023`

`colour_datasets.loaders.build_Solomotav2023(load: bool = True)  $\rightarrow$  DatasetLoader_Solomotav2023`

Singleton factory that builds the *Solomatov and Akkaynak (2023) Camera Dataset* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Solomatov and Akkaynak (2023) Camera Dataset* dataset loader.

#### Return type

`colour_datasets.loaders.DatasetLoader_Solomotav2023`

#### References

[]

### Camera Spectral Sensitivity Database - Jiang et al. (2013)

<code>DatasetLoader_Jiang2013()</code>	Define the <i>Jiang et al. (2013) Camera Spectral Sensitivity Database</i> dataset loader.
--	--

### `colour_datasets.loaders.DatasetLoader_Jiang2013`

**class** `colour_datasets.loaders.DatasetLoader_Jiang2013`

Bases: `AbstractDatasetLoader`

Define the *Jiang et al. (2013) Camera Spectral Sensitivity Database* dataset loader.

#### Attributes

- `colour_datasets.loaders.DatasetLoader_Jiang2013.ID`

#### Methods

- `colour_datasets.loaders.DatasetLoader_Jiang2013.__init__()`
- `colour_datasets.loaders.DatasetLoader_Jiang2013.load()`

#### References

[JLGS13]

**ID:** `str = '3245883'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, RGB_CameraSensitivities]`

Sync, parse, convert and return the *Jiang et al. (2013) Camera Spectral Sensitivity Database* dataset content.

#### Returns

*Jiang et al. (2013) Camera Spectral Sensitivity Database* dataset content.

#### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Jiang2013()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
28
```

`build_Jiang2013([load])`

Singleton factory that builds the *Jiang et al. (2013) Camera Spectral Sensitivity Database* dataset loader.

## `colour_datasets.loaders.build_Jiang2013`

`colour_datasets.loaders.build_Jiang2013(load: bool = True) → DatasetLoader_Jiang2013`

Singleton factory that builds the *Jiang et al. (2013) Camera Spectral Sensitivity Database* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Jiang et al. (2013) Camera Spectral Sensitivity Database* dataset loader.

### Return type

`colour_datasets.loaders.DatasetLoader_Jiang2013`

## References

[JLGS13]

## Constant Hue Loci Data - Hung and Berns (1995)

`DatasetLoader_Hung1995()`

Define the *Hung and Berns (1995) Constant Hue Loci Data* dataset loader.

## `colour_datasets.loaders.DatasetLoader_Hung1995`

**class** `colour_datasets.loaders.DatasetLoader_Hung1995`

Bases: `AbstractDatasetLoader`

Define the *Hung and Berns (1995) Constant Hue Loci Data* dataset loader.

## Attributes

- `colour_datasets.loaders.DatasetLoader_Hung1995.ID`

## Methods

- `colour_datasets.loaders.DatasetLoader_Hung1995.__init__()`
- `colour_datasets.loaders.DatasetLoader_Hung1995.load()`

## References

[HB95]

**ID:** `str = '3367463'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, Dict[str, ConstantPerceivedHueColourMatches_Hung1995]]`

Sync, parse, convert and return the *Hung and Berns (1995) Constant Hue Loci Data* dataset content.

### Returns

*Hung and Berns (1995) Constant Hue Loci Data* dataset content.

### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Hung1995()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
6
```

`build_Hung1995([load])`

Singleton factory that builds the *Hung and Berns (1995) Constant Hue Loci Data* dataset loader.

## `colour_datasets.loaders.build_Hung1995`

`colour_datasets.loaders.build_Hung1995(load: bool = True) → DatasetLoader_Hung1995`

Singleton factory that builds the *Hung and Berns (1995) Constant Hue Loci Data* dataset loader.

### Parameters

**load** (`bool`) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Hung and Berns (1995) Constant Hue Loci Data* dataset loader.

### Return type

`colour_datasets.loaders.DatasetLoader_Hung1995`

## References

[HB95]

### Constant Perceived-Hue Data - Ebner and Fairchild (1998)

<code>DatasetLoader_Ebner1998()</code>	Define the <i>Ebner and Fairchild (1998) Constant Perceived-Hue Data</i> dataset loader.
--	--

### `colour_datasets.loaders.DatasetLoader_Ebner1998`

**class** `colour_datasets.loaders.DatasetLoader_Ebner1998`

Bases: `AbstractDatasetLoader`

Define the *Ebner and Fairchild (1998) Constant Perceived-Hue Data* dataset loader.

#### Attributes

- `colour_datasets.loaders.DatasetLoader_Ebner1998.ID`

#### Methods

- `colour_datasets.loaders.DatasetLoader_Ebner1998.__init__()`
- `colour_datasets.loaders.DatasetLoader_Ebner1998.load()`

## References

[EF98]

**ID:** `str = '3362536'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, Dict[int, ConstantPerceivedHueColourMatches_Ebner1998]]`

Sync, parse, convert and return the *Ebner and Fairchild (1998) Constant Perceived-Hue Data* dataset content.

#### Returns

*Ebner and Fairchild (1998) Constant Perceived-Hue Data*\* dataset content.

#### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Ebner1998()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
1
```

`build_Ebner1998([load])`

Singleton factory that builds the *Ebner and Fairchild (1998) Constant Perceived-Hue Data* dataset loader.

## `colour_datasets.loaders.build_Ebner1998`

`colour_datasets.loaders.build_Ebner1998(load: bool = True) → DatasetLoader_Ebner1998`

Singleton factory that builds the *Ebner and Fairchild (1998) Constant Perceived-Hue Data* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Ebner and Fairchild (1998) Constant Perceived-Hue Data* dataset loader.

### Return type

`colour_datasets.loaders.DatasetLoader_Ebner1998`

## References

[EF98]

## Corresponding-Colour Datasets - Luo and Rhodes (1999)

`DatasetLoader_Luo1999()`

Define the *Luo and Rhodes (1999) Corresponding-Colour Datasets* dataset loader.

## `colour_datasets.loaders.DatasetLoader_Luo1999`

**class** `colour_datasets.loaders.DatasetLoader_Luo1999`

Bases: `AbstractDatasetLoader`

Define the *Luo and Rhodes (1999) Corresponding-Colour Datasets* dataset loader.

## Attributes

- `colour_datasets.loaders.DatasetLoader_Luo1999.ID`

## Methods

- `colour_datasets.loaders.DatasetLoader_Luo1999.__init__()`
- `colour_datasets.loaders.DatasetLoader_Luo1999.load()`

## References

[Bre87], [LR99], [MMT76]

**ID:** `str = '3270903'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, CorrespondingColourDataset_Luo1999]`

Sync, parse, convert and return the *Luo and Rhodes (1999) Corresponding-Colour Datasets* dataset content.

### Returns

*Luo and Rhodes (1999) Corresponding-Colour Datasets* dataset content.

### Return type

`dict`

## Notes

- *Brene.p6.dat* has only 11 samples while *Breneman (1987)* has 12 results.
- The illuminance in *Lux* for *Breneman (1987)* datasets given by *Luo and Rhodes (1999)* is in domain [50, 3870] while *Breneman (1987)* reports luminance in  $cd/m^2$  in domain [15, 11100], i.e. [47, 34871.69] in *Lux*. The metadata has been corrected accordingly.
- The illuminance values, i.e. 14 and 40, for *McCann, McKee and Taylor (1976)* datasets given by *Luo and Rhodes (1999)* were not found in [MMT76]. The values in use are the average of both.

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Luo1999()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
37
```

`build_Luo1999([load])`

Singleton factory that the builds *Luo and Rhodes (1999) Corresponding-Colour Datasets* dataset loader.

## colour\_datasets.loaders.build\_Luo1999

colour\_datasets.loaders.**build\_Luo1999**(load: *bool* = *True*) → *DatasetLoader\_Luo1999*

Singleton factory that the builds *Luo and Rhodes (1999) Corresponding-Colour Datasets* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Luo and Rhodes (1999) Corresponding-Colour Datasets* dataset loader.

### Return type

colour\_datasets.loaders.DatasetLoader\_Luo1999

### References

[Bre87], [LR99], [MMT76]

## Forest Colors - Jaaskelainen et al. (1994)

DatasetLoader_ForestColors()	Defines the <i>University of Kuopio Forest Colors</i> dataset loader.
------------------------------	---

## colour\_datasets.loaders.DatasetLoader\_ForestColors

**class** colour\_datasets.loaders.**DatasetLoader\_ForestColors**

Bases: DatasetLoader\_KuopioUniversity

Defines the *University of Kuopio Forest Colors* dataset loader.

### Attributes

- colour\_datasets.loaders.Forest Colors.ID
- colour\_datasets.loaders.Forest Colors.METADATA

### Methods

- colour\_datasets.loaders.Forest Colors.\_\_init\_\_()
- colour\_datasets.loaders.Forest Colors.load()



## References

[[SUniversityoKuopio](#)]

ID: `str = '3269920'`

Dataset record id, i.e. the *Zenodo* record number.

```
METADATA: ClassVar[Dict] = {('forest_matlab', 'birch.mat'): ('birch',
SpectralShape(380, 850, 5), True, None), ('forest_matlab', 'pine.mat'): ('pine',
SpectralShape(380, 850, 5), True, None), ('forest_matlab', 'spruce.mat'): ('spruce',
SpectralShape(380, 850, 5), True, None)}
```

Mapping of paths and `colour_datasets.loaders.kuopio.MatFileMetadata_KuopioUniversity` class instances.

<code>build_ForestColors([load])</code>	Singleton factory that the builds <i>University of Kuopio Forest Colors</i> dataset loader.
---	---

### `colour_datasets.loaders.build_ForestColors`

`colour_datasets.loaders.build_ForestColors(load: bool = True) → DatasetLoader_KuopioUniversity`  
 Singleton factory that the builds *University of Kuopio Forest Colors* dataset loader.

#### Parameters

`load (bool)` – Whether to load the dataset upon instantiation.

#### Returns

Singleton instance of the *University of Kuopio Forest Colors* dataset loader.

#### Return type

*DatasetLoader\_ForestColors*

## References

[[SUniversityoKuopio](#)]

### LUTCHI Colour Appearance Data - Luo and Rhodes (1997)

<code>DatasetLoader_Luo1997()</code>	Define the <i>Luo and Rhodes (1997) LUTCHI Colour Appearance Data</i> dataset loader.
--------------------------------------	---

### `colour_datasets.loaders.DatasetLoader_Luo1997`

**class** `colour_datasets.loaders.DatasetLoader_Luo1997`

Bases: `AbstractDatasetLoader`

Define the *Luo and Rhodes (1997) LUTCHI Colour Appearance Data* dataset loader.

## Attributes

- `colour_datasets.loaders.DatasetLoader_Luo1997.ID`

## Methods

- `colour_datasets.loaders.DatasetLoader_Luo1997.__init__()`
- `colour_datasets.loaders.DatasetLoader_Luo1997.load()`

## References

[LCR+91a], [LCR+91b], [LGR+93], [LR97]

**ID:** `str = '4394536'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, ExperimentalGroupLuo1997]`

Sync, parse, convert and return the *Luo and Rhodes (1997) LUTCHI Colour Appearance Data* dataset content.

### Returns

*Luo and Rhodes (1997) LUTCHI Colour Appearance Data* dataset content.

### Return type

`dict`

## Notes

- The *cold65wnl* file located at the following url: <https://web.archive.org/web/20031230164218/http://colour.derby.ac.uk/colour/info/lutchi/data/cold65wnl> is empty. Mark Fairchild's archive located at the following url: [http://www.rit-mcsl.org/fairchild/files/LUTCHI\\_Data.sit](http://www.rit-mcsl.org/fairchild/files/LUTCHI_Data.sit) also contains an empty *cold65wnl* file. A single line break has been added to the original file so that it can be uploaded to *Zenodo*.
- The *BIT.p\*.\** files are effectively named *bit\_p\*.\**.
- The *cola.l* file does not exist and is assumed to be named *colal.l*.
- The *Self-luminous* entry for *Table I: Summary of the experimental groups* is named *CRT* in the sub-sequent tables.
- The *mean4.p\** and *col.rf.p\** files should all have 40 samples, unexpectedly all the *col.rf.p\** files have 41 samples. The first data rows are used as they are better correlated between the two datasets. The last row could be the experimental whitepoint.
- The *mean4.p7*, *mean4.p8*, *mean4.p9*, *mean4.p10*, *mean4.p11*, and *mean4.p12* files represent brightness experimental results.
- The *bit\_p3.vis* file has 5 columns instead of 4 only the last 3 are accounted for.

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Luo1997()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
8
```

<code>build_Luo1997([load])</code>	Singleton factory that the builds <i>Luo and Rhodes (1997) LUTCHI Colour Appearance Data</i> dataset loader.
------------------------------------	--

## colour\_datasets.loaders.build\_Luo1997

colour\_datasets.loaders.**build\_Luo1997**(load: *bool* = *True*) → *DatasetLoader\_Luo1997*

Singleton factory that the builds *Luo and Rhodes (1997) LUTCHI Colour Appearance Data* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Luo and Rhodes (1997) LUTCHI Colour Appearance Data* dataset loader.

### Return type

colour\_datasets.loaders.DatasetLoader\_Luo1997

## References

[LCR+91a], [LCR+91b], [LGR+93], [LR97]

## Labsphere SRS-99-020 - Labsphere (2019)

<code>DatasetLoader_Labsphere2019()</code>	Define the <i>Labsphere (2019) Labsphere SRS-99-020</i> dataset loader.
--	---

## colour\_datasets.loaders.DatasetLoader\_Labsphere2019

**class** colour\_datasets.loaders.**DatasetLoader\_Labsphere2019**

Bases: *AbstractDatasetLoader*

Define the *Labsphere (2019) Labsphere SRS-99-020* dataset loader.

## Attributes

- `colour_datasets.loaders.DatasetLoader_Labsphere2019.ID`

## Methods

- `colour_datasets.loaders.DatasetLoader_Labsphere2019.__init__()`
- `colour_datasets.loaders.DatasetLoader_Labsphere2019.load()`

## References

[Labsphere19]

**ID:** `str = '3245875'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, SpectralDistribution]`

Sync, parse, convert and return the *Labsphere (2019) Labsphere SRS-99-020* dataset content.

### Returns

*Labsphere (2019) Labsphere SRS-99-020* dataset content.

### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Labsphere2019()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
1
```

`build_Labsphere2019([load])`

Singleton factory that builds the *Labsphere (2019) Labsphere SRS-99-020* dataset loader.

## `colour_datasets.loaders.build_Labsphere2019`

`colour_datasets.loaders.build_Labsphere2019(load: bool = True)` → `DatasetLoader_Labsphere2019`

Singleton factory that builds the *Labsphere (2019) Labsphere SRS-99-020* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Labsphere (2019) Labsphere SRS-99-020* dataset loader.

### Return type

`colour_datasets.loaders.DatasetLoader_Labsphere2019`

## References

[Labsphere19]

### Lumber Spectra - Hiltunen (n.d.)

<code>DatasetLoader_LumberSpectra()</code>	Defines the <i>University of Kuopio Lumber Spectra</i> dataset loader.
--	--

### `colour_datasets.loaders.DatasetLoader_LumberSpectra`

**class** `colour_datasets.loaders.DatasetLoader_LumberSpectra`

Bases: `DatasetLoader_KuopioUniversity`

Defines the *University of Kuopio Lumber Spectra* dataset loader.

#### Attributes

- `colour_datasets.loaders.Lumber Spectra.ID`
- `colour_datasets.loaders.Lumber Spectra.METADATA`

#### Methods

- `colour_datasets.loaders.Lumber Spectra.__init__()`
- `colour_datasets.loaders.Lumber Spectra.load()`

## References

[HUniversityKuopio]

**ID:** `str = '3269924'`

Dataset record id, i.e. the *Zenodo* record number.

```
METADATA: ClassVar[Dict] = {('lumber_matlab', 'aspenWb.mat'): ('aspenWb',
SpectralShape(380, 2700, 1), True, None), ('lumber_matlab', 'aspenWp.mat'):
('aspenWp', SpectralShape(380, 2700, 1), True, None), ('lumber_matlab',
'birchWb.mat'): ('birchWb', SpectralShape(380, 2700, 1), True, None),
('lumber_matlab', 'birchWp.mat'): ('birchWp', SpectralShape(380, 2700, 1), True,
None), ('lumber_matlab', 'pineWb.mat'): ('pineWb', SpectralShape(380, 2700, 1), True,
None), ('lumber_matlab', 'pineWp.mat'): ('pineWp', SpectralShape(380, 2700, 1), True,
None), ('lumber_matlab', 'spruceWb.mat'): ('spruceWb', SpectralShape(380, 2700, 1),
True, None), ('lumber_matlab', 'spruceWp.mat'): ('spruceWp', SpectralShape(380, 2700,
1), True, None)}
```

Mapping of paths and `colour_datasets.loaders.kuopio.MatFileMetadata_KuopioUniversity` class instances.

<code>build_LumberSpectra([load])</code>	Singleton factory that the builds <i>University of Kuopio Lumber Spectra</i> dataset loader.
--	--

## colour\_datasets.loaders.build\_LumberSpectra

colour\_datasets.loaders.**build\_LumberSpectra**(load: *bool* = *True*) → *DatasetLoader\_KuopioUniversity*

Singleton factory that the builds *University of Kuopio Lumber Spectra* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *University of Kuopio Lumber Spectra* dataset loader.

### Return type

*DatasetLoader\_LumberSpectra*

### References

[HUniversityoKuopio]

## Measured Commercial LED Spectra - Brendel (2020)

<i>DatasetLoader_Brendel2020()</i>	Define the <i>Brendel (2020) Measured Commercial LED Spectra</i> dataset loader.
------------------------------------	--

## colour\_datasets.loaders.DatasetLoader\_Brendel2020

**class** colour\_datasets.loaders.**DatasetLoader\_Brendel2020**

Bases: *AbstractDatasetLoader*

Define the *Brendel (2020) Measured Commercial LED Spectra* dataset loader.

### Attributes

ID

### Methods

load

### References

[Bre20]

**ID:** *str* = *'4051012'*

Dataset record id, i.e. the *Zenodo* record number.

**load()** → *Dict[str, SpectralDistribution]*

Sync, parse, convert and return the *Brendel (2020) Measured Commercial LED Spectra* dataset content.

### Returns

*Brendel (2020) Measured Commercial LED Spectra* dataset content.

**Return type**

dict

**Examples**

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Brendel2020()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
29
```

`build_Brendel2020([load])`

Singleton factory that builds the *Brendel (2020) Measured Commercial LED Spectra* dataset loader.

**colour\_datasets.loaders.build\_Brendel2020**

colour\_datasets.loaders.**build\_Brendel2020**(load: bool = True) → *DatasetLoader\_Brendel2020*

Singleton factory that builds the *Brendel (2020) Measured Commercial LED Spectra* dataset loader.

**Parameters**

**load** (bool) – Whether to load the dataset upon instantiation.

**Returns**

Singleton instance of the *Brendel (2020) Measured Commercial LED Spectra* dataset loader.

**Return type**

colour\_datasets.loaders.DatasetLoader\_Brendel2020

**References**

[Bre20]

**Munsell Colors Glossy (All) (Spectrofotometer Measured) - Orava (n.d.)**

<code>DatasetLoader_MunsellColorsGlossyAllSpectrof</code>	Defines the <i>University of Kuopio Munsell Colors Glossy (All) (Spectrofotometer Measured)</i> dataset loader.
---	---

**colour\_datasets.loaders.DatasetLoader\_MunsellColorsGlossyAllSpectrofotometerMeasured**

**class** colour\_datasets.loaders.**DatasetLoader\_MunsellColorsGlossyAllSpectrofotometerMeasured**

Bases: DatasetLoader\_KuopioUniversity

Defines the *University of Kuopio Munsell Colors Glossy (All) (Spectrofotometer Measured)* dataset loader.

## Attributes

- `colour_datasets.loaders.Munsell Colors Glossy (All) (Spectrofotometer Measured).ID`
- `colour_datasets.loaders.Munsell Colors Glossy (All) (Spectrofotometer Measured).METADATA`

## Methods

- `colour_datasets.loaders.Munsell Colors Glossy (All) (Spectrofotometer Measured).__init__()`
- `colour_datasets.loaders.Munsell Colors Glossy (All) (Spectrofotometer Measured).load()`

## References

[[OUniversityoKuopio](#)]

**ID:** `str = '3269918'`

Dataset record id, i.e. the *Zenodo* record number.

**METADATA:** `ClassVar[Dict] = {'munsell380_780_1_glossy_mat', 'munsell380_780_1_glossy.mat'}: ('X', SpectralShape(380, 780, 1), True, None)}`

Mapping of paths and `colour_datasets.loaders.kuopio.MatFileMetadata_KuopioUniversity` class instances.

<code>build_MunsellColorsGlossyAllSpectrofotometer</code>	Singleton factory that the builds <i>University of Kuopio Munsell Colors Glossy (All) (Spectrofotometer Measured)</i> dataset loader.
---	---

## `colour_datasets.loaders.build_MunsellColorsGlossyAllSpectrofotometerMeasured`

`colour_datasets.loaders.build_MunsellColorsGlossyAllSpectrofotometerMeasured`(load: `bool = True`) → `DatasetLoader_KuopioUniversity`

Singleton factory that the builds *University of Kuopio Munsell Colors Glossy (All) (Spectrofotometer Measured)* dataset loader.

### Parameters

**load** (`bool`) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *University of Kuopio Munsell Colors Glossy (All) (Spectrofotometer Measured)* dataset loader.

### Return type

`DatasetLoader_MunsellColorsGlossyAllSpectrofotometerMeasured`



## References

[OUniversityoKuopio]

### Munsell Colors Glossy (Spectrofotometer Measured) - Haanpalo (n.d.)

<code>DatasetLoader_MunsellColorsGlossySpectrofotometerMea</code>	Defines the <i>University of Kuopio Munsell Colors Glossy (Spectrofotometer Measured)</i> dataset loader.
---	---

### `colour_datasets.loaders.DatasetLoader_MunsellColorsGlossySpectrofotometerMeasured`

**class** `colour_datasets.loaders.DatasetLoader_MunsellColorsGlossySpectrofotometerMeasured`

Bases: `DatasetLoader_KuopioUniversity`

Defines the *University of Kuopio Munsell Colors Glossy (Spectrofotometer Measured)* dataset loader.

## Attributes

- `colour_datasets.loaders.Munsell Colors Glossy (Spectrofotometer Measured).ID`
- `colour_datasets.loaders.Munsell Colors Glossy (Spectrofotometer Measured).METADATA`

## Methods

- `colour_datasets.loaders.Munsell Colors Glossy (Spectrofotometer Measured).__init__()`
- `colour_datasets.loaders.Munsell Colors Glossy (Spectrofotometer Measured).load()`

## References

[HUniversityoKuopioa]

**ID:** `str = '3269916'`

Dataset record id, i.e. the *Zenodo* record number.

**METADATA:** `ClassVar[Dict] = {'munsell400_700_10_mat', 'munsell400_700_10.mat'}: ('munsell', SpectralShape(400, 700, 10), True, 'S')}`

Mapping of paths and `colour_datasets.loaders.kuopio.MatFileMetadata_KuopioUniversity` class instances.

<code>build_MunsellColorsGlossySpectrofotometerMea</code>	Singleton factory that the builds <i>University of Kuopio Munsell Colors Glossy (Spectrofotometer Measured)</i> dataset loader.
---	---

→ DatasetLoader KuopioUniversity

## Parameters

## Returns

### Return type

## References

Munsell Colors Matt (AOTF Measured) - Hauta-Kasari (n.d.)

<code>DatasetLoader_MunsellColorsMattAOTFMeasured()</code>	Defines the <i>University of Kuopio Munsell Colors Matt (AOTF Measured)</i> dataset loader.
--	---

colour datasets.loaders.DatasetLoader MunsellColorsMattAOTFMeasured

```
class colour_datasets.loaders.DatasetLoader_MunsellColorsMattA0TFMeasured
```

Bases: DatasetLoader\_KuopioUniversity

Defines the *University of Kuopio Munsell Colors Matt (AOTF Measured)* dataset loader.

## Attributes

- colour\_datasets.loaders.Munsell Colors Matt (A0TF Measured).ID
- colour\_datasets.loaders.Munsell Colors Matt (A0TF Measured).METADATA

## Methods

- `colour_datasets.loaders.Munsell Colors Matt (AOTF Measured).__init__()`
- `colour_datasets.loaders.Munsell Colors Matt (AOTF Measured).load()`

## References

[HautaKasariUniversityKuopioa]

**ID:** `str = '3269914'`

Dataset record id, i.e. the *Zenodo* record number.

**METADATA:** `ClassVar[Dict] = {('munsell400_700_5_mat', 'munsell400_700_5.mat'):  
('munsell', SpectralShape(400, 700, 5), True, 'S')}`

Mapping of paths and `colour_datasets.loaders.kuopio.  
MatFileMetadata_KuopioUniversity` class instances.

<code>build_MunsellColorsMattAOTFMeasured([load])</code>	Singleton factory that the builds <i>University of Kuopio Munsell Colors Matt (AOTF Measured)</i> dataset loader.
--	---

## `colour_datasets.loaders.build_MunsellColorsMattAOTFMeasured`

`colour_datasets.loaders.build_MunsellColorsMattAOTFMeasured(load: bool = True) →  
DatasetLoader_KuopioUniversity`

Singleton factory that the builds *University of Kuopio Munsell Colors Matt (AOTF Measured)* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *University of Kuopio Munsell Colors Matt (AOTF Measured)* dataset loader.

### Return type

*DatasetLoader\_MunsellColorsMattAOTFMeasured*

## References

[HautaKasariUniversityKuopioa]

## Munsell Colors Matt (Spectrofotometer Measured) - Hauta-Kasari (n.d.)

<code>DatasetLoader_MunsellColorsMattSpectrofotome</code>	Defines the <i>University of Kuopio Munsell Colors Matt (Spectrofotometer Measured)</i> dataset loader.
---	---

## `colour_datasets.loaders.DatasetLoader_MunsellColorsMattSpectrofotometerMeasured`

**class** `colour_datasets.loaders.DatasetLoader_MunsellColorsMattSpectrofotometerMeasured`

Bases: `DatasetLoader_KuopioUniversity`

Defines the *University of Kuopio Munsell Colors Matt (Spectrofotometer Measured)* dataset loader.

## Attributes

- `colour_datasets.loaders.Munsell Colors Matt (Spectrofotometer Measured).ID`
- `colour_datasets.loaders.Munsell Colors Matt (Spectrofotometer Measured).METADATA`

## Methods

- `colour_datasets.loaders.Munsell Colors Matt (Spectrofotometer Measured).__init__()`
- `colour_datasets.loaders.Munsell Colors Matt (Spectrofotometer Measured).load()`

## References

[[HautaKasariUniversityKuopio](#)]

**ID:** `str = '3269912'`

Dataset record id, i.e. the *Zenodo* record number.

**METADATA:** `ClassVar[Dict] = {('munsell380_800_1_mat', 'munsell380_800_1.mat'):  
('munsell', SpectralShape(380, 800, 1), True, 'S')}`

Mapping of paths and `colour_datasets.loaders.kuopio.  
MatFileMetadata_KuopioUniversity` class instances.

<code>build_MunsellColorsMattSpectrofotometerMeasu</code>	Singleton factory that the builds <i>University of Kuopio Munsell Colors Matt (Spectrofotometer Measured)</i> dataset loader.
---	---

## `colour_datasets.loaders.build_MunsellColorsMattSpectrofotometerMeasured`

`colour_datasets.loaders.build_MunsellColorsMattSpectrofotometerMeasured(load: bool = True) → DatasetLoader_KuopioUniversity`

Singleton factory that the builds *University of Kuopio Munsell Colors Matt (Spectrofotometer Measured)* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *University of Kuopio Munsell Colors Matt (Spectrofotometer Measured)* dataset loader.

### Return type

*DatasetLoader\_MunsellColorsMattSpectrofotometerMeasured*

## References

[HautaKasariUniversityoKuopiob]

### New Color Specifications for ColorChecker SG and Classic Charts - X-Rite (2016)

<code>DatasetLoader_XRite2016()</code>	Define the <i>X-Rite (2016) New Color Specifications for ColorChecker SG and Classic Charts</i> dataset loader.
--	---

### `colour_datasets.loaders.DatasetLoader_XRite2016`

**class** `colour_datasets.loaders.DatasetLoader_XRite2016`

Bases: `AbstractDatasetLoader`

Define the *X-Rite (2016) New Color Specifications for ColorChecker SG and Classic Charts* dataset loader.

#### Attributes

- `colour_datasets.loaders.DatasetLoader_XRite2016.ID`

#### Methods

- `colour_datasets.loaders.DatasetLoader_XRite2016.__init__()`
- `colour_datasets.loaders.DatasetLoader_XRite2016.load()`

## References

[XRite16]

**ID:** `str = '3245895'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, ColourChecker]`

Sync, parse, convert and return the *X-Rite (2016) New Color Specifications for ColorChecker SG and Classic Charts* dataset content.

#### Returns

*X-Rite (2016) New Color Specifications for ColorChecker SG and Classic Charts* dataset content.

#### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_XRite2016()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
4
```

`build_XRite2016([load])`

Singleton factory that the builds *X-Rite (2016) New Color Specifications for ColorChecker SG and Classic Charts* dataset loader.

## `colour_datasets.loaders.build_XRite2016`

`colour_datasets.loaders.build_XRite2016(load: bool = True) → DatasetLoader_XRite2016`

Singleton factory that the builds *X-Rite (2016) New Color Specifications for ColorChecker SG and Classic Charts* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *X-Rite (2016) New Color Specifications for ColorChecker SG and Classic Charts* dataset loader.

### Return type

`colour_datasets.loaders.DatasetLoader_XRite2016`

## References

[XRite16]

## Observer Function Database - Asano (2015)

`DatasetLoader_Asano2015()`

Define the *Asano (2015) Observer Function Database* dataset loader.

## `colour_datasets.loaders.DatasetLoader_Asano2015`

**class** `colour_datasets.loaders.DatasetLoader_Asano2015`

Bases: `AbstractDatasetLoader`

Define the *Asano (2015) Observer Function Database* dataset loader.

## Attributes

- `colour_datasets.loaders.DatasetLoader_Asano2015.ID`

## Methods

- `colour_datasets.loaders.DatasetLoader_Asano2015.__init__()`
- `colour_datasets.loaders.DatasetLoader_Asano2015.load()`
- `colour_datasets.loaders.DatasetLoader_Asano2015.parse_workbook_Asano2015()`

## References

[Asa15]

**ID:** `str = '3252742'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, Dict[int, Specification_Asano2015]]`

Sync, parse, convert and return the *Asano (2015) Observer Function Database* dataset content.

### Returns

*Asano (2015) Observer Function Database* dataset content.

### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Asano2015()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
2
```

**static parse\_workbook\_Asano2015**(*workbook: str, template: str, observers: tuple = (1, 10)*) → `Dict[str, Dict]`

Parse given *Asano (2015) Observer Function Database* workbook.

### Parameters

- **workbook** (`str`) – *Asano (2015) Observer Function Database* workbook path.
- **template** (`str`) – Template used to create the *CMFS* names.
- **observers** (`tuple`) – Observers range.

### Returns

*Asano (2015) Observer Function Database* workbook observer data.

### Return type

`dict`

`build_Asano2015([load])`

Singleton factory that the builds *Asano (2015) Observer Function Database* dataset loader.

## colour\_datasets.loaders.build\_Asano2015

colour\_datasets.loaders.**build\_Asano2015**(load: *bool* = *True*) → *DatasetLoader\_Asano2015*  
 Singleton factory that the builds *Asano (2015) Observer Function Database* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Asano (2015) Observer Function Database* dataset loader.

### Return type

colour\_datasets.loaders.DatasetLoader\_Asano2015

### References

[Asa15]

## Paper Spectra - Haanpalo (n.d.)

DatasetLoader_PaperSpectra()	Defines the <i>University of Kuopio Paper Spectra</i> dataset loader.
------------------------------	---

## colour\_datasets.loaders.DatasetLoader\_PaperSpectra

**class** colour\_datasets.loaders.**DatasetLoader\_PaperSpectra**

Bases: DatasetLoader\_KuopioUniversity

Defines the *University of Kuopio Paper Spectra* dataset loader.

### Attributes

- colour\_datasets.loaders.Paper Spectra.ID
- colour\_datasets.loaders.Paper Spectra.METADATA

### Methods

- colour\_datasets.loaders.Paper Spectra.\_\_init\_\_()
- colour\_datasets.loaders.Paper Spectra.load()

### References

[HUniversityoKuopiob]

**ID:** *str* = '3269922'

Dataset record id, i.e. the *Zenodo* record number.



```
METADATA: ClassVar[Dict] = {('paper_matlab', 'cardboardsce.mat'): ('cardboardsce',
SpectralShape(400, 700, 10), True, None), ('paper_matlab', 'cardboardsci.mat'):
('cardboardsci', SpectralShape(400, 700, 10), True, None), ('paper_matlab',
'mirrorsci.mat'): ('mirrorsci', SpectralShape(400, 700, 10), True, None),
('paper_matlab', 'newsprintsce.mat'): ('newsprintsce', SpectralShape(400, 700, 10),
True, None), ('paper_matlab', 'newsprintsci.mat'): ('newsprintsci',
SpectralShape(400, 700, 10), True, None), ('paper_matlab', 'papersce.mat'):
('papersce', SpectralShape(400, 700, 10), True, None), ('paper_matlab',
'papersci.mat'): ('papersci', SpectralShape(400, 700, 10), True, None)}
Mapping of paths and colour_datasets.loaders.kuopio.
MatFileMetadata_KuopioUniversity class instances.
```

<code>build_PaperSpectra([load])</code>	Singleton factory that the builds <i>University of Kuopio Paper Spectra</i> dataset loader.
---	---

### colour\_datasets.loaders.build\_PaperSpectra

colour\_datasets.loaders.**build\_PaperSpectra**(load: *bool* = *True*) → DatasetLoader\_KuopioUniversity  
 Singleton factory that the builds *University of Kuopio Paper Spectra* dataset loader.

#### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

#### Returns

Singleton instance of the *University of Kuopio Paper Spectra* dataset loader.

#### Return type

*DatasetLoader\_PaperSpectra*

#### References

[HUniversityoKuopiob]

### Physlight - Camera Spectral Sensitivity Curves - Winquist et al. (2022)

<code>DatasetLoader_Winquist2022()</code>	Define the <i>Winqvist et al. (2022) Physlight - Camera Spectral Sensitivity Curves</i> dataset /loader.
---	--

### colour\_datasets.loaders.DatasetLoader\_Winquist2022

**class** colour\_datasets.loaders.**DatasetLoader\_Winquist2022**

Bases: *AbstractDatasetLoader*

Define the *Winqvist et al. (2022) Physlight - Camera Spectral Sensitivity Curves* dataset /loader.

## Attributes

ID

## Methods

load

## References

[WTWetaDigital22]

**ID:** `str = '6590768'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, MultiSpectralDistributions_AMPAS]`

Sync, parse, convert and return the *Winquist et al. (2022) Physlight - Camera Spectral Sensitivity Curves* dataset content.

### Returns

*Winquist et al. (2022) Physlight - Camera Spectral Sensitivity Curves* dataset content.

### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Winquist2022()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
17
```

`build_Winquist2022([load])`

Singleton factory that builds the *Winquist et al. (2022) Physlight - Camera Spectral Sensitivity Curves* dataset loader.

## `colour_datasets.loaders.build_Winquist2022`

`colour_datasets.loaders.build_Winquist2022(load: bool = True)` → `DatasetLoader_Winquist2022`

Singleton factory that builds the *Winquist et al. (2022) Physlight - Camera Spectral Sensitivity Curves* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Winquist et al. (2022) Physlight - Camera Spectral Sensitivity Curves* dataset loader.

### Return type

`colour_datasets.loaders.DatasetLoader_Winquist2022`

## References

[WTWetaDigital22]

### RAW to ACES Utility Data - Dyer et al. (2017)

<code>DatasetLoader_Dyer2017()</code>	Define the <i>Dyer et al. (2017) RAW to ACES Utility Data</i> dataset loader.
---------------------------------------	---

### `colour_datasets.loaders.DatasetLoader_Dyer2017`

**class** `colour_datasets.loaders.DatasetLoader_Dyer2017`

Bases: `AbstractDatasetLoader`

Define the *Dyer et al. (2017) RAW to ACES Utility Data* dataset loader.

#### Attributes

- `colour_datasets.loaders.DatasetLoader_Dyer2017.ID`

#### Methods

- `colour_datasets.loaders.DatasetLoader_Dyer2017.__init__()`
- `colour_datasets.loaders.DatasetLoader_Dyer2017.load()`

## References

[DFI+17]

**ID:** `str = '3372171'`

Dataset record id, i.e. the *Zenodo* record number.

**load()** → `Dict[str, Dict[str, SpectralDistribution_AMPAS | MultiSpectralDistributions_AMPAS]]`

Sync, parse, convert and return the *Dyer et al. (2017) RAW to ACES Utility Data* dataset content.

#### Returns

*Dyer et al. (2017) RAW to ACES Utility Data* dataset content.

#### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Dyer2017()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
4
```

`build_Dyer2017([load])`

Singleton factory that builds the *Dyer et al. (2017) RAW to ACES Utility Data* dataset loader.

## `colour_datasets.loaders.build_Dyer2017`

`colour_datasets.loaders.build_Dyer2017(load: bool = True) → DatasetLoader_Dyer2017`

Singleton factory that builds the *Dyer et al. (2017) RAW to ACES Utility Data* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Dyer et al. (2017) RAW to ACES Utility Data* dataset loader.

### Return type

`colour_datasets.loaders.DatasetLoader_Dyer2017`

## References

[DFI+17]

## Spectral Database of Commonly Used Cine Lighting - Karge et al. (2015)

`DatasetLoader_Zhao2009()`

Define the *Zhao et al. (2009) Spectral Sensitivity Database* dataset loader.

## `colour_datasets.loaders.DatasetLoader_Zhao2009`

**class** `colour_datasets.loaders.DatasetLoader_Zhao2009`

Bases: `AbstractDatasetLoader`

Define the *Zhao et al. (2009) Spectral Sensitivity Database* dataset loader.

## Attributes

- `colour_datasets.loaders.DatasetLoader_Zhao2009.ID`

## Methods

- `colour_datasets.loaders.DatasetLoader_Zhao2009.__init__()`
- `colour_datasets.loaders.DatasetLoader_Zhao2009.load()`

## References

[ZKT109]

**ID:** `str = '4297288'`

Dataset record id, i.e. the *Zenodo* record number.

**load()**  $\rightarrow$  `Dict[str, RGB_CameraSensitivities]`

Sync, parse, convert and return the *Zhao et al. (2009) Spectral Sensitivity Database* dataset content.

### Returns

*Zhao et al. (2009) Spectral Sensitivity Database* dataset content.

### Return type

`dict`

## Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> dataset = DatasetLoader_Zhao2009()
>>> with suppress_stdout():
...     dataset.load()
...
>>> len(dataset.content.keys())
12
```

`build_Zhao2009([load])`

Singleton factory that builds the *Zhao et al. (2009) Spectral Sensitivity Database* dataset loader.

## `colour_datasets.loaders.build_Zhao2009`

`colour_datasets.loaders.build_Zhao2009(load: bool = True)  $\rightarrow$  DatasetLoader_Zhao2009`

Singleton factory that builds the *Zhao et al. (2009) Spectral Sensitivity Database* dataset loader.

### Parameters

**load** (*bool*) – Whether to load the dataset upon instantiation.

### Returns

Singleton instance of the *Zhao et al. (2009) Spectral Sensitivity Database* dataset loader.

### Return type

`colour_datasets.loaders.DatasetLoader_Zhao2009`

## References

[ZKTI09]

## Spectral Sensitivity Database - Zhao et al. (2009)

<code>DatasetLoader_Zhao2009()</code>	Define the <i>Zhao et al. (2009) Spectral Sensitivity Database</i> dataset loader.
<code>build_Zhao2009([load])</code>	Singleton factory that builds the <i>Zhao et al. (2009) Spectral Sensitivity Database</i> dataset loader.

## Zenodo Records & Community

### Configuration

`colour_datasets`

<code>Configuration([configuration])</code>	<i>Colour - Datasets</i> configuration factory based on <code>colour.utilities.Structure</code> class and allowing to access key values using dot syntax.
---	---

### `colour_datasets.Configuration`

**class** `colour_datasets.Configuration(configuration: Dict | None = None)`

Bases: `Structure`

*Colour - Datasets* configuration factory based on `colour.utilities.Structure` class and allowing to access key values using dot syntax.

#### Parameters

**configuration** (Dict | None) – Configuration to use instead of the default one.

<code>sandbox([api_url, community])</code>	A context manager and decorator temporarily setting the configuration to the <i>Zenodo</i> sandbox.
--	---

### `colour_datasets.sandbox`

**class** `colour_datasets.sandbox(api_url: str = 'https://sandbox.zenodo.org/api', community: str = 'colour-science-datasets')`

A context manager and decorator temporarily setting the configuration to the *Zenodo* sandbox.

#### Parameters

- **api\_url** (str) – *Zenodo* sandbox url.
- **community** (str) – *Zenodo* community.

```
__init__(api_url: str = 'https://sandbox.zenodo.org/api', community: str =
'colour-science-datasets') → None
```

#### Parameters

- **api\_url** (str) –
- **community** (str) –

#### Return type

None

#### Methods

```
__init__([api_url, community])
```

colour\_datasets.records

<code>use_sandbox([state, api_url, community])</code>	Modify the <i>Colour - Datasets</i> configuration to use <i>Zenodo</i> sandbox.
---	---

#### colour\_datasets.records.use\_sandbox

```
colour_datasets.records.use_sandbox(state: bool = True, api_url: str =
'https://sandbox.zenodo.org/api', community: str =
'colour-science-datasets')
```

Modify the *Colour - Datasets* configuration to use *Zenodo* sandbox.

#### Parameters

- **state** (bool) – Whether to use *Zenodo* sandbox.
- **api\_url** (str) – *Zenodo* sandbox url.
- **community** (str) – *Zenodo* community.

#### Record

colour\_datasets

<code>Record(data[, configuration])</code>	Define an object storing a <i>Zenodo</i> record data and providing methods to sync it in a local repository.
--	--

#### colour\_datasets.Record

```
class colour_datasets.Record(data: dict, configuration: Configuration | None = None)
```

Bases: `object`

Define an object storing a *Zenodo* record data and providing methods to sync it in a local repository.

#### Parameters

- **data** (dict) – *Zenodo* record data.
- **configuration** (Configuration | None) – *Colour - Datasets* configuration.

## Attributes

- `colour_datasets.Record.data`
- `colour_datasets.Record.configuration`
- `colour_datasets.Record.repository`
- `colour_datasets.Record.id`
- `colour_datasets.Record.title`

## Methods

- `colour_datasets.Record.__init__()`
- `colour_datasets.Record.__str__()`
- `colour_datasets.Record.__repr__()`
- `colour_datasets.Record.from_id()`
- `colour_datasets.Record.synced()`
- `colour_datasets.Record.pull()`
- `colour_datasets.Record.remove()`

## Examples

```
>>> record = Record(json_open("https://zenodo.org/api/records/3245883"))
>>> record.id
'3245883'
>>> record.title
'Camera Spectral Sensitivity Database - Jiang et al. (2013)'
```

### property data: `dict`

Getter property for the *Zenodo* record data.

#### Returns

*Zenodo* record data.

#### Return type

`dict`

### property configuration: `Configuration`

Getter property for the *Colour - Datasets* configuration.

#### Returns

*Colour - Datasets* configuration.

#### Return type

`colour_datasets.Configuration`

### property repository: `str`

Getter property for the *Zenodo* record local repository.

#### Returns

*Zenodo* record local repository.

#### Return type

`str`



**property id:** `str`

Getter property for the *Zenodo* record id.

**Returns**

*Zenodo* record id.

**Return type**

`str`

**property title:** `str`

Getter property for the *Zenodo* record title.

**Returns**

*Zenodo* record title.

**Return type**

`str`

**static from\_id**(*id\_*: `str`, *configuration*: `Configuration` | `None` = `None`, *retries*: `int` = 3) → *Record*  
`colour_datasets.Record` class factory that builds an instance using given *Zenodo* record id.

**Parameters**

- **id** – *Zenodo* record id.
- **configuration** (`Configuration` | `None`) –  
**configuration**  
*Colour - Datasets* configuration.
- **retries** (`int`) – Number of retries in case where a networking error occurs.
- **id\_** (`str`) –

**Returns**

*Zenodo* record data.

**Return type**

`colour_datasets.Record`

## Examples

```
>>> Record.from_id("3245883").title
'Camera Spectral Sensitivity Database - Jiang et al. (2013)'
```

**synced()** → `bool`

Return whether the *Zenodo* record data is synced to the local repository.

**Returns**

Whether the *Zenodo* record data is synced to the local repository.

**Return type**

`bool`

### Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> record = Record.from_id("3245883")
>>> with suppress_stdout():
...     record.pull()
...
>>> record.synced()
True
>>> record.remove()
>>> record.synced()
False
```

**pull**(*use\_urls\_txt\_file*: *bool* = *True*, *retries*: *int* = *3*)

Pull the *Zenodo* record data to the local repository.

#### Parameters

- **use\_urls\_txt\_file** (*bool*) – Whether to use the *urls.txt* file: if such a file is present in the *Zenodo* record data, the urls it defines take precedence over the record data files. The later will be used in the eventuality where the urls are not available.
- **retries** (*int*) – Number of retries in case where a networking error occurs or the *MD5* hash is not matching.

### Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> record = Record.from_id("3245883")
>>> record.remove()
>>> with suppress_stdout():
...     record.pull()
...
>>> record.synced()
True
```

**remove**()

Remove the *Zenodo* record data local repository.

### Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> record = Record.from_id("3245883")
>>> with suppress_stdout():
...     record.pull()
...
>>> record.remove()
>>> record.synced()
False
```

## Community

colour\_datasets

<code>Community(data[, configuration])</code>	Define an object storing a <i>Zenodo</i> community data.
---	--

### colour\_datasets.Community

**class** colour\_datasets.**Community**(data: *Dict*, configuration: *Configuration* | *None* = *None*)

Bases: *Mapping*

Define an object storing a *Zenodo* community data.

#### Parameters

- **data** (*Dict*) – *Zenodo* community data.
- **configuration** (*Configuration* | *None*) – *Colour - Datasets* configuration.

#### Attributes

- colour\_datasets.Community.data
- colour\_datasets.Community.configuration
- colour\_datasets.Community.repository
- colour\_datasets.Community.records

#### Methods

- colour\_datasets.Community.\_\_init\_\_()
- colour\_datasets.Community.\_\_str\_\_()
- colour\_datasets.Community.\_\_repr\_\_()
- colour\_datasets.Community.\_\_getitem\_\_()
- colour\_datasets.Community.\_\_iter\_\_()
- colour\_datasets.Community.\_\_len\_\_()
- colour\_datasets.Community.from\_id()
- colour\_datasets.Community.synced()
- colour\_datasets.Community.pull()
- colour\_datasets.Community.remove()

## Examples

```
>>> community_data = json_open(
...     "https://zenodo.org/api/communities/colour-science-datasets"
... )
>>> records_data = json_open(community_data["links"]["records"])
>>> community = Community(
...     {
...         "community": community_data,
...         "records": records_data,
...     }
... )
>>> community["3245883"].title
'Camera Spectral Sensitivity Database - Jiang et al. (2013)'
```

**property data:** `Dict`

Getter property for the *Zenodo* community data.

**Returns**

*Zenodo* community data.

**Return type**

`dict`

**property configuration:** `Configuration`

Getter property for the *Colour - Datasets* configuration.

**Returns**

*Colour - Datasets* configuration.

**Return type**

`colour_datasets.Configuration`

**property repository:** `str`

Getter property for the *Zenodo* community local repository.

**Returns**

*Zenodo* community local repository.

**Return type**

`str`

**property records:** `Dict`

Getter property for the *Zenodo* community records.

**Returns**

*Zenodo* community records.

**Return type**

`dict`

**static from\_id**(*id*: `str`, *configuration*: `Configuration` | `None` = `None`, *retries*: `int` = 3) → `Community`

`colour_datasets.Community` class factory that builds an instance using given *Zenodo* community id.

**Parameters**

- **id** – *Zenodo* community id.
- **configuration** (`Configuration` | `None`) –

**configuration :**

*Colour - Datasets* configuration.

- **retries** (*int*) – Number of retries in case where a networking error occurs.
- **id\_** (*str*) –

**Returns**

*Zenodo* community data.

**Return type**

`colour_datasets.Community`

**Examples**

```
>>> community = Community.from_id("colour-science-datasets-tests")
>>> community["3245883"].title
'Camera Spectral Sensitivity Database - Jiang et al. (2013)'
```

**synced()** → *bool*

Return whether the *Zenodo* community data is synced to the local repository.

**Returns**

Whether the *Zenodo* community data is synced to the local repository.

**Return type**

*bool*

**Examples**

```
>>> from colour_datasets.utilities import suppress_stdout
>>> community = Community.from_id("colour-science-datasets-tests")
>>> with suppress_stdout():
...     community.pull()
...
>>> community.synced()
True
>>> community.remove()
>>> community.synced()
False
```

**pull**(*use\_urls\_txt\_file: bool = True, retries: int = 3*)

Pull the *Zenodo* community data to the local repository.

**Parameters**

- **use\_urls\_txt\_file** (*bool*) – Whether to use the *urls.txt* file: if such a file is present in a *Zenodo* record data, the urls it defines take precedence over the record data files. The later will be used in the eventuality where the urls are not available.
- **retries** (*int*) – Number of retries in case where a networking error occurs or the *MD5* hash is not matching.

### Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> community = Community.from_id("colour-science-datasets-tests")
>>> community.remove()
>>> with suppress_stdout():
...     community.pull()
...
>>> community.synced()
True
```

#### `remove()`

Remove the *Zenodo* community data local repository.

### Examples

```
>>> from colour_datasets.utilities import suppress_stdout
>>> community = Community.from_id("colour-science-datasets-tests")
>>> with suppress_stdout():
...     community.pull()
...
>>> community.remove()
>>> community.synced()
False
```

<code>datasets()</code>	Singleton factory that returns <i>Zenodo</i> community that holds the datasets information.
-------------------------	---

### `colour_datasets.datasets`

`colour_datasets.datasets()` → *Community*

Singleton factory that returns *Zenodo* community that holds the datasets information.

#### Returns

Singleton instance of the *Zenodo* community.

#### Return type

`colour_datasets.Community`

### Examples

```
>>> datasets()["3245883"].title
'Camera Spectral Sensitivity Database - Jiang et al. (2013)'
```

## Utilities

### Common

colour\_datasets.utilities

<code>json_open(url[, retries])</code>	Open given url and return its content as <i>JSON</i> .
<code>hash_md5(filename[, chunk_size])</code>	Compute the <i>Message Digest 5 (MD5)</i> hash of given file.
<code>suppress_stdout()</code>	A context manager and decorator temporarily suppressing standard output.
<code>url_download(url, filename[, md5, retries])</code>	Download given url and saves its content at given file.

### colour\_datasets.utilities.json\_open

colour\_datasets.utilities.json\_open(url: str, retries: int = 3) → Dict

Open given url and return its content as *JSON*.

#### Parameters

- **url** (str) – Url to open.
- **retries** (int) – Number of retries in case where a networking error occurs.

#### Returns

*JSON* data.

#### Return type

dict

#### Raises

`urllib.error.URLError`, `ValueError` – If the url cannot be opened or parsed as *JSON*.

#### Notes

- The definition caches the request *JSON* output for 5 minutes.

#### Examples

```
>>> json_open("https://zenodo.org/api/records/3245883")
...
{'conceptdoi': '10.5281/zenodo.3245882'}
```

### colour\_datasets.utilities.hash\_md5

colour\_datasets.utilities.hash\_md5(filename: str, chunk\_size: int = 2\*\*16) → str

Compute the *Message Digest 5 (MD5)* hash of given file.

#### Parameters

- **filename** (str) – File to compute the *MD5* hash of.
- **chunk\_size** (int) – Chunk size to read from the file.

#### Returns

*MD5* hash of given file.

#### Return type

`str`

### `colour_datasets.utilities.suppress_stdout`

#### **class** `colour_datasets.utilities.suppress_stdout`

A context manager and decorator temporarily suppressing standard output.

`__init__()`

#### Methods

```
__init__()
```

### `colour_datasets.utilities.url_download`

`colour_datasets.utilities.url_download(url: str, filename: str, md5: str | None = None, retries: int = 3)`

Download given url and saves its content at given file.

#### Parameters

- **url** (*str*) – Url to download.
- **filename** (*str*) – File to save the url content at.
- **md5** (*str* | *None*) – *Message Digest 5 (MD5)* hash of the content at given url. If provided the saved content at given file will be hashed and compared to md5.
- **retries** (*int*) – Number of retries in case where a networking error occurs or the *MD5* hash is not matching.

#### Examples

```
>>> import os
>>> url_download(
...     "https://github.com/colour-science/colour-datasets", os.devnull
... )
```

### Spreadsheet

`colour_datasets.utilities`

<code>row_to_index(row)</code>	Return the 0-based index of given row name.
<code>index_to_row(index)</code>	Return the row name of given 0-based index.
<code>column_to_index(column)</code>	Return the 0-based index of given column letters.
<code>index_to_column(index)</code>	Return the column letters of given 0-based index.
<code>cell_range_values(sheet, cell_range)</code>	Return given workbook sheet cell range values, i.e. the values of the rows and columns for given cell range.



### colour\_datasets.utilities.row\_to\_index

colour\_datasets.utilities.**row\_to\_index**(row: *int* | *str*) → *int*

Return the 0-based index of given row name.

**Parameters**

**row** (*int* | *str*) – Row name.

**Returns**

0-based row index.

**Return type**

class `int` or *str*

#### Examples

```
>>> row_to_index("1")
0
```

### colour\_datasets.utilities.index\_to\_row

colour\_datasets.utilities.**index\_to\_row**(index: *int*) → *str*

Return the row name of given 0-based index.

**Parameters**

**index** (*int*) – 0-based row index.

**Returns**

Row name.

**Return type**

*str*

#### Examples

```
>>> index_to_row(0)
'1'
```

### colour\_datasets.utilities.column\_to\_index

colour\_datasets.utilities.**column\_to\_index**(column: *str*) → *int*

Return the 0-based index of given column letters.

**Parameters**

**column** (*str*) – Column letters

**Returns**

0-based column index.

**Return type**

*int*

### Examples

```
>>> column_to_index("A")
0
```

### colour\_datasets.utilities.index\_to\_column

colour\_datasets.utilities.**index\_to\_column**(index: *int*) → *str*

Return the column letters of given 0-based index.

#### Parameters

**index** (*int*) – 0-based column index.

#### Returns

Column letters

#### Return type

*str*

### Examples

```
>>> index_to_column(0)
'A'
```

### colour\_datasets.utilities.cell\_range\_values

colour\_datasets.utilities.**cell\_range\_values**(sheet: *Sheet*, cell\_range: *str*) → *List[str]*

Return given workbook sheet cell range values, i.e. the values of the rows and columns for given cell range.

#### Parameters

- **sheet** (*Sheet*) – Workbook sheet.
- **cell\_range** (*str*) – Cell range values, e.g. "A1:C3".

#### Returns

List of row values.

#### Return type

*list*

## 3.1.2 Indices and tables

- [genindex](#)
- [search](#)

## 1.4 CODE OF CONDUCT

The *Code of Conduct*, adapted from the [Contributor Covenant 1.4](#), is available on the [Code of Conduct](#) page.



## 1.5 CONTACT & SOCIAL

The *Colour Developers* can be reached via different means:

- [Email](#)
- [Facebook](#)
- [Github Discussions](#)
- [Gitter](#)
- [Twitter](#)



## 1.6 ABOUT

**Colour - Datasets** by Colour Developers

Copyright 2019 Colour Developers – [colour-developers@colour-science.org](mailto:colour-developers@colour-science.org)

This software is released under terms of BSD-3-Clause: <https://opensource.org/licenses/BSD-3-Clause>  
<https://github.com/colour-science/colour-datasets>





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## Symbols

`__init__()` (*colour\_datasets.sandbox* method), 42  
`__init__()` (*colour\_datasets.utilities.suppress\_stdout* method), 52

## A

`AbstractDatasetLoader` (class in *colour\_datasets.loaders*), 8

## B

`build_AgfaIT872Set()` (in *colour\_datasets.loaders*), 12  
`build_Asano2015()` (in *colour\_datasets.loaders*), 36  
`build_Brendel2020()` (in *colour\_datasets.loaders*), 27  
`build_Dyer2017()` (in *colour\_datasets.loaders*), 40  
`build_Ebner1998()` (in *colour\_datasets.loaders*), 18  
`build_ForestColors()` (in *colour\_datasets.loaders*), 21  
`build_Hung1995()` (in *colour\_datasets.loaders*), 16  
`build_Jakob2019()` (in *colour\_datasets.loaders*), 11  
`build_Jiang2013()` (in *colour\_datasets.loaders*), 15  
`build_Labsphere2019()` (in *colour\_datasets.loaders*), 24  
`build_LumberSpectra()` (in *colour\_datasets.loaders*), 26  
`build_Luo1997()` (in *colour\_datasets.loaders*), 23  
`build_Luo1999()` (in *colour\_datasets.loaders*), 20  
`build_MunsellColorsGlossyAllSpectrofotometerMeasured()` (in module *colour\_datasets.loaders*), 28  
`build_MunsellColorsGlossySpectrofotometerMeasured()` (in module *colour\_datasets.loaders*), 30  
`build_MunsellColorsMattAOTFMeasured()` (in module *colour\_datasets.loaders*), 31  
`build_MunsellColorsMattSpectrofotometerMeasured()` (in module *colour\_datasets.loaders*), 32  
`build_PaperSpectra()` (in *colour\_datasets.loaders*), 37

`build_Solomotav2023()` (in *colour\_datasets.loaders*), 13  
`build_Winquist2022()` (in *colour\_datasets.loaders*), 38  
`build_XRite2016()` (in *colour\_datasets.loaders*), 34  
`build_Zhao2009()` (in *colour\_datasets.loaders*), 41

## C

`cell_range_values()` (in *colour\_datasets.utilities*), 54  
`column_to_index()` (in *colour\_datasets.utilities*), 53  
`Community` (class in *colour\_datasets*), 47  
`Configuration` (class in *colour\_datasets*), 42  
`configuration` (*colour\_datasets.Community* property), 48  
`configuration` (*colour\_datasets.Record* property), 44  
`content` (*colour\_datasets.loaders.AbstractDatasetLoader* property), 9

## D

`data` (*colour\_datasets.Community* property), 48  
`data` (*colour\_datasets.Record* property), 44  
`DATASET_LOADERS` (in *colour\_datasets.loaders*), 8  
`DatasetLoader_AgfaIT872Set` (class in *colour\_datasets.loaders*), 11  
`DatasetLoader_Asano2015` (class in *colour\_datasets.loaders*), 34  
`DatasetLoader_Brendel2020` (class in *colour\_datasets.loaders*), 26  
`DatasetLoader_Dyer2017` (class in *colour\_datasets.loaders*), 39  
`DatasetLoader_Ebner1998` (class in *colour\_datasets.loaders*), 17  
`DatasetLoader_ForestColors` (class in *colour\_datasets.loaders*), 20  
`DatasetLoader_Hung1995` (class in *colour\_datasets.loaders*), 15  
`DatasetLoader_Jakob2019` (class in *colour\_datasets.loaders*), 10  
`DatasetLoader_Jiang2013` (class in *colour\_datasets.loaders*), 14

[DatasetLoader\\_Labsphere2019](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_Jiang2013 attribute\)](#), [14](#))  
[DatasetLoader\\_LumberSpectra](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_Labsphere2019 attribute\)](#), [24](#))  
[DatasetLoader\\_Luo1997](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_LumberSpectra attribute\)](#), [25](#))  
[DatasetLoader\\_Luo1999](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_Luo1997 attribute\)](#), [22](#))  
[DatasetLoader\\_MunsellColorsGlossyAllSpectrofotometerMeasured](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_Luo1999 attribute\)](#), [19](#))  
[DatasetLoader\\_MunsellColorsGlossySpectrofotometerMeasured](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_MunsellColorsGlossyAllSpectrofotometer attribute\)](#), [28](#))  
[DatasetLoader\\_MunsellColorsMattaOTFMeasured](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_MunsellColorsGlossySpectrofotometer attribute\)](#), [29](#))  
[DatasetLoader\\_MunsellColorsMattSpectrofotometerMeasured](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_MunsellColorsMattaOTFMeasured attribute\)](#), [31](#))  
[DatasetLoader\\_PaperSpectra](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_MunsellColorsMattSpectrofotometer attribute\)](#), [32](#))  
[DatasetLoader\\_Solomotav2023](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_PaperSpectra attribute\)](#), [36](#))  
[DatasetLoader\\_Winquist2022](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_Solomotav2023 attribute\)](#), [13](#))  
[DatasetLoader\\_XRite2016](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_Winquist2022 attribute\)](#), [38](#))  
[DatasetLoader\\_Zhao2009](#) (class in [ID \(colour\\_datasets.loaders.DatasetLoader\\_XRite2016 attribute\)](#), [33](#))  
[datasets\(\)](#) (in module [colour\\_datasets](#)), [50](#)  
**F**  
[from\\_id\(\)](#) ([colour\\_datasets.Community](#) static method), [48](#)  
[from\\_id\(\)](#) ([colour\\_datasets.Record](#) static method), [45](#)  
**H**  
[hash\\_md5\(\)](#) (in module [colour\\_datasets.utilities](#)), [51](#)  
**I**  
[ID](#) ([colour\\_datasets.loaders.AbstractDatasetLoader](#) attribute), [8](#)  
[id](#) ([colour\\_datasets.loaders.AbstractDatasetLoader](#) property), [9](#)  
[ID \(colour\\_datasets.loaders.DatasetLoader\\_AgfaIT872Set](#) attribute), [12](#)  
[ID \(colour\\_datasets.loaders.DatasetLoader\\_Asano2015](#) attribute), [35](#)  
[ID \(colour\\_datasets.loaders.DatasetLoader\\_Brendel2020](#) attribute), [26](#)  
[ID \(colour\\_datasets.loaders.DatasetLoader\\_Dyer2017](#) attribute), [39](#)  
[ID \(colour\\_datasets.loaders.DatasetLoader\\_Ebner1998](#) attribute), [17](#)  
[ID \(colour\\_datasets.loaders.DatasetLoader\\_ForestColors](#) attribute), [21](#)  
[ID \(colour\\_datasets.loaders.DatasetLoader\\_Hung1995](#) attribute), [16](#)  
[ID \(colour\\_datasets.loaders.DatasetLoader\\_Jakob2019](#) attribute), [10](#)  
**J**  
[json\\_open\(\)](#) (in module [colour\\_datasets.utilities](#)), [51](#)  
**L**  
[load\(\)](#) ([colour\\_datasets.loaders.AbstractDatasetLoader](#) method), [9](#)  
[load\(\)](#) ([colour\\_datasets.loaders.DatasetLoader\\_Asano2015](#) method), [35](#)  
[load\(\)](#) ([colour\\_datasets.loaders.DatasetLoader\\_Brendel2020](#) method), [26](#)  
[load\(\)](#) ([colour\\_datasets.loaders.DatasetLoader\\_Dyer2017](#) method), [39](#)  
[load\(\)](#) ([colour\\_datasets.loaders.DatasetLoader\\_Ebner1998](#) method), [17](#)  
[load\(\)](#) ([colour\\_datasets.loaders.DatasetLoader\\_Hung1995](#) method), [16](#)  
[load\(\)](#) ([colour\\_datasets.loaders.DatasetLoader\\_Jakob2019](#) method), [10](#)  
[load\(\)](#) ([colour\\_datasets.loaders.DatasetLoader\\_Jiang2013](#) method), [14](#)  
[load\(\)](#) ([colour\\_datasets.loaders.DatasetLoader\\_Labsphere2019](#) method), [24](#)

load() (*colour\_datasets.loaders.DatasetLoader\_Luo1987* method), 22  
 load() (*colour\_datasets.loaders.DatasetLoader\_Luo1999* method), 19  
 load() (*colour\_datasets.loaders.DatasetLoader\_Solomonow2023* method), 13  
 load() (*colour\_datasets.loaders.DatasetLoader\_Winkler2022* method), 38  
 load() (*colour\_datasets.loaders.DatasetLoader\_XRite2016* method), 33  
 load() (*colour\_datasets.loaders.DatasetLoader\_Zhao2009* method), 41  
 load() (*in module colour\_datasets*), 7  
 synced() (*colour\_datasets.Community method*), 49  
 synced() (*colour\_datasets.Record method*), 45  
 title (*colour\_datasets.Record property*), 45  
 url\_download() (*in module colour\_datasets.utilities*), 52  
 use\_sandbox() (*in module colour\_datasets.records*), 43

## M

METADATA (*colour\_datasets.loaders.DatasetLoader\_AgfaIT872Set* attribute), 12  
 METADATA (*colour\_datasets.loaders.DatasetLoader\_ForestColors* attribute), 21  
 METADATA (*colour\_datasets.loaders.DatasetLoader\_LumberSpectra* attribute), 25  
 METADATA (*colour\_datasets.loaders.DatasetLoader\_MunsellColorsGlossyAllSpectrofotometerMeasured* attribute), 28  
 METADATA (*colour\_datasets.loaders.DatasetLoader\_MunsellColorsGlossySpectrofotometerMeasured* attribute), 29  
 METADATA (*colour\_datasets.loaders.DatasetLoader\_MunsellColorsMattAOTFMeasured* attribute), 31  
 METADATA (*colour\_datasets.loaders.DatasetLoader\_MunsellColorsMattSpectrofotometerMeasured* attribute), 32  
 METADATA (*colour\_datasets.loaders.DatasetLoader\_PaperSpectra* attribute), 36

## P

parse\_workbook\_Asano2015() (*colour\_datasets.loaders.DatasetLoader\_Asano2015* static method), 35  
 pull() (*colour\_datasets.Community method*), 49  
 pull() (*colour\_datasets.Record method*), 46

## R

Record (*class in colour\_datasets*), 43  
 record (*colour\_datasets.loaders.AbstractDatasetLoader* property), 8  
 records (*colour\_datasets.Community property*), 48  
 remove() (*colour\_datasets.Community method*), 50  
 remove() (*colour\_datasets.Record method*), 46  
 repository (*colour\_datasets.Community property*), 48  
 repository (*colour\_datasets.Record property*), 44  
 row\_to\_index() (*in module colour\_datasets.utilities*), 53

## S

sandbox (*class in colour\_datasets*), 42  
 suppress\_stdout (*class in colour\_datasets.utilities*), 52  
 sync() (*colour\_datasets.loaders.AbstractDatasetLoader* method), 9