Unified Format (UniForm) Glossary for Version 1.0

Variable Name	Hierarchy	Data Type Expected	Example

 # The metadata block is a combination of variables that can be called upon during visualisation, defined using asterisks (*), and information that is not essential for visualisation but which provides a full and complete description of the data set

Variable Name	Hierarchy	Data Type Expected	Example
Metadata (header)	*(top level)		
# Time and date that the current UniForm file was generated			
date_time_UniForm_file_created	metadata	Comment: user-defined	**Date_time_uniForm_file_created, 31/08/2020, 08:00:00
# Version number of the Unified Format			
UniForm_version_number	**(second level)	Float: user-defined	**UniForm_version_number, 1.0
# Coding used for *.CSV file (typically 'utf_8')			
coding	**(second level)	String: user-defined	**coding, 'utf-8'
# Model scale			
scale_factor	**(second level)	Float: user-defined	**scale_factor, 0.25
# Experimental uncertainty for each measured value. Each variable requires definition of the value of uncertainty, the associated units and a description in words of the variable			
experimental_uncertainty	**(second level)	Float: user-defined String: user-defined	**experimental_uncertainty, 1.E-6, 'mm', 'displacement in y', 1.E-7, 'mm', 'displacement in z'
# Label to identify the source of the data			
data_source	metadata	Comment: user-defined	# data_source: University of Bristol
# Label to identify the type of source data			
data_source_type	metadata	Comment: user-defined	# data_source_type: Experiment (UoB shaker table)
# Point of contact who can answer questions relating to the data			
data_source_contact	metadata	Comment: user-defined	# data_source_contact: Joe Bloggs, j.bloggs@email.com
# Date that the data was generated			
date_data_created	metadata	Comment: user-defined	# date_data_created: 01/02/2019

# Time that the data was created			
time_data_created	metadata	Comment: user-defined	# time_data_created: 14:33:27
# The original file name of the data, as generated			
original_filename	metadata	Comment: user-defined	# original_filename: C:\Documents\UoB\2019\data_T8004.csv
# Type of model used to generate the data			
model_type	metadata	Comment: user-defined	# model_type: Multi Layer Array
# Description of the model type			
model_description	metadata	Comment: user-defined	# model_description: 50% cracked acetyl bricks
# Label for the specific test case			
test_name	metadata	Comment: user-defined	# test_name: T8004
# Description of the test			
test_description	metadata	Comment: user-defined	# test_description: shake spectrum X
# Sensors used to record the data			
sensor_specifications	metadata	Comment: user-defined	# sensor_specifications: Hall Effect sensors, Linear Conductive Potentiometers
# System used to acquire experimental data			
data_aquisition_system	metadata	Comment: user-defined	# data_acquisition_system: University of Bristol microDAQ
# Specification of the digital/analogue filters applied to the raw data			
data_filter_specifications	metadata	Comment: user-defined	# data_filter_specifications: Low-pass, 80Hz
# Sampling frequency of the data acquisition			
sampling_frequency	metadata	Comment: user-defined	# sampling_frequency: 5kHz
# Software used to process the raw experiment data			
software_experimentalData	metadata	Comment: user-defined	# software_experiment_data: UoB, software v2.7

 # The data blocks provide the input information essential for visualisation

Data Blocks:

GENERAL_INFORMATION	*(top level)		
# Number of components in the data set			
number_of_components	**(second level)	Integer: user-defined	**number_of_components, 6
# The location of the origin (0,0,0) of the data with respect to the global coordinate system. The user needs to specify a description in words, the coordinates and the associated units (choice of 'm' or 'mm')			
coord_system_zero_location	**(second level)	String: user-defined Float: user-defined String: 'm' or 'mm'	**coord_system_zero_location, 'middle base of core', 'm'

 # Two TIME_DATA blocks are available, HOMOGENEOUS and NON-HOMOGENEOUS. Only one should be defined. HOMOGENEOUS is intended for data types that that have regular, non-variable time steps (such as simulation data). NON-HOMOGENEOUS allows for data where there are variations in time step. A full time vector must be specified for the case of NON-HOMOGENEOUS, however this information can be inferred from other variables if the time vector is HOMOGENEOUS.

TIME_DATA	*(top level)		
# Time at which the external forces/motion is applied			
time_external_input_applied	**(second level)	Float: user-defined	**time_external_input_applied, 0
# Description of the time vector. Includes the choice HOMOGENEOUS/NON-HOMOGENEOUS, time_step/nominal_time_step (also requires number_of_time_steps for HOMOGENEOUS), and units (choice of 's' or 'ms')			
time_vector_type	**(second level)	String: HOMOGENEOUS / NON-HOMOGENEOUS Integer(s): user-defined String: 's' or 'ms'	**time_vector_type, 'HOMOGENEOUS', 0.25, 4, 'ms' OR **time_vector_type, 'NON-HOMOGENEOUS', 0.2, 'ms'
# The full time vector, only required for NON-HOMOGENEOUS time data			
complete_time_vector	***(third level)	Float: user-defined	**complete_time_vector, (0.00, 0.205, 0.41, 0.60)

COMPONENT_INFORMATION	*(top level)		
# Options for handling of NaN values. 'DEFAULT' NaNs set to zero, 'HIDE' ensures values are not shown during visualisation, 'CUSTOM' enables a user-defined value to be entered			
NaN_handling	**(second level)	String: 'DEFAULT' / 'HIDE' / 'CUSTOM' FLoat: user-defined	**NaN_handling, 'CUSTOM', 1.E-4
# The information vector for each component includes the fields: 'component_ID', 'component_type', 'component_label', CoG (x,y,z,roll,pitch,yaw). Prescribed list of available types (01 = interstitial brick, 02 = lattice brick)			
component_info_vector	**(second level)	String: user-defined Integer: 01 or 02 String: 'interstitial' or 'lattice' String: user-defined Float: user-defined	**component_info_vector, 'component01', '01', 'interstitial_brick', 'IB1220_L07', (-5.56E-4, -1.93E-4, -2.3E-4, 0, 0, 0)
# Units for the components listed in component_info_vector, 'm' or 'mm' for displacement, 'rad' or 'deg' for angles			
component_info_units	**(second level)	String: 'm'/ 'mm'/ 'rad'/ 'deg'	**component_info_units, ('m', 'm', 'm', 'rad', 'rad', 'rad')

COMPONENT_DATA	*(top level)		
# Number of fields in data block			
component_data_length	**(second level)	Integer: user-defined	**component_data_length, 6
# Units for displacement: 'm' or 'mm', Units for angles: 'rad' or 'deg', Units for forces: 'N' or 'kN', Units for angular forces: 'N.m' or 'kN.m'			
component_data_units	**(second level)	String: 'm'/ 'mm'/ 'rad'/ 'deg'/ 'N'/ 'kN'/ 'N.m'/ 'kN.m'	**component_data_units, ('mm', 'mm', 'mm', 'rad', 'rad', 'rad)
# Options for handling of NaN values. 'DEFAULT' NaNs set to zero, 'HIDE' ensures values are not shown during visualisation, 'CUSTOM' enables a user-defined value to be entered			
NaN_handling	**(second level)	String: 'DEFAULT' / 'HIDE' / 'CUSTOM' Float: user-defined	**NaN_handling, 'DEFAULT'

# Adds a fixed value to be added to every data point in the data set. Can be set to 'ZERO' or user-defined as 'NON-ZERO', which then requires definition of the offset value and the associated units			
component_data_offset	**(second level)	String: 'ZERO' / 'NON-ZERO' Float: user-defined String: 'm'/ 'mm'/ 'rad'/ 'deg'/ 'N'/ 'kN'/ 'N.m'/ 'kN.m'	**component_data_offset, 'NON-ZERO', (-3, 0, 0, 0, 2.4, 0), ('kN', 'kN', 'kN', 'kN.m', 'kN.m', 'kN.m')
# For each time step data set the number of rows should correspond to the number of components. Any empty rows or missing data shall be handled as per the NaN_handling previously specified.			
time_step	***(third level)	Float: user-defined String: user-defined Float: user-defined	***time_step, 0, component1, -8.565e+04,-5.546e+04,-2.327e+04, -8.565e-01,-5.546e-01,-2.327e-01, component2, -8.570e+04,-5.533e+04,-2.327e+04, -8.570e-01,-5.533e-01,-2.327e-01, component3, -8.577e+04,-5.512e+04,-9.894e+04, -8.577e-01,-5.512e-01,-9.894e-01, component4, -8.591e+04,-5.475e+04, 3.103e+04, -8.591e-01,-5.475e-01, 3.103e-01, component5, -8.600e+04,-5.443e+04,-1.038e+03, -8.600e-01,-5.443e-01,-1.038e-01, component6, -8.614e-04, -5.400e-04,-9.878e-04, -8.614e-04, NaN, -9.878e-04,