Reference: RN10.0.1

MASTA release: 10.0.1

Release Notes

Commercial in Confidence

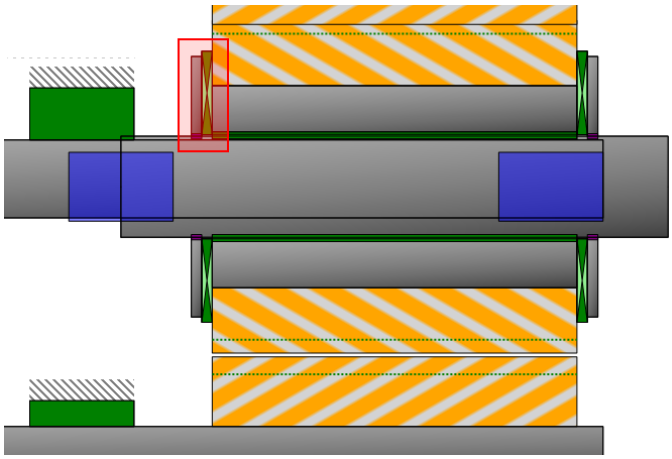
1 Contents and Summary

The 10.0.1 release of MASTA contains all the capabilities from previous releases, various additional features and some enhancements to previously included features. Various bug fixes are also included. Areas where you will find new or revised functionality include the following:

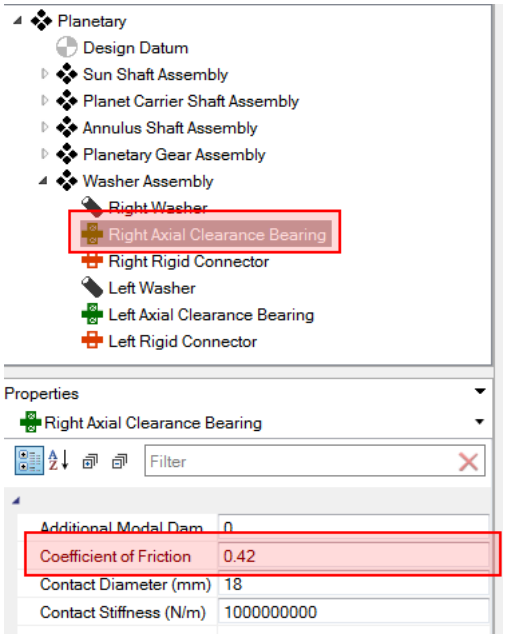
2 What's New in MASTA release: 10.0.1

2.1 Frictional Losses

Additional frictional losses can now be included via axial and radial clearance bearings. This is useful for representing frictional losses between, for example, a planet gear face and thrust washer:



To include these losses, from the property grid in Design mode, set the coefficient of friction on the axial or radial clearance bearing (this can be overridden on a per-load-case basis):



2.2 Damage Unit Option

There is a new option in Settings > Measurements for Damage. This defaults to Percentage, the previous behaviour, but can also be set to 'Fraction', where 100% = 1.

2.3 Specification of a Duty Cycle from within Parametric Study Tool

Functionality has been added which allows for the specification and running of a duty cycle from within Parametric Study Tool (PST) mode. Through this functionality the necessity to create 1000s of individual load cases in the MASTA GUI can be avoided and, since results can be saved from and loaded into PST, this is a route for users to save duty cycle results. Currently, bearing duty cycle results are provided but this will be expanded in the near future to include results for shafts and gears.

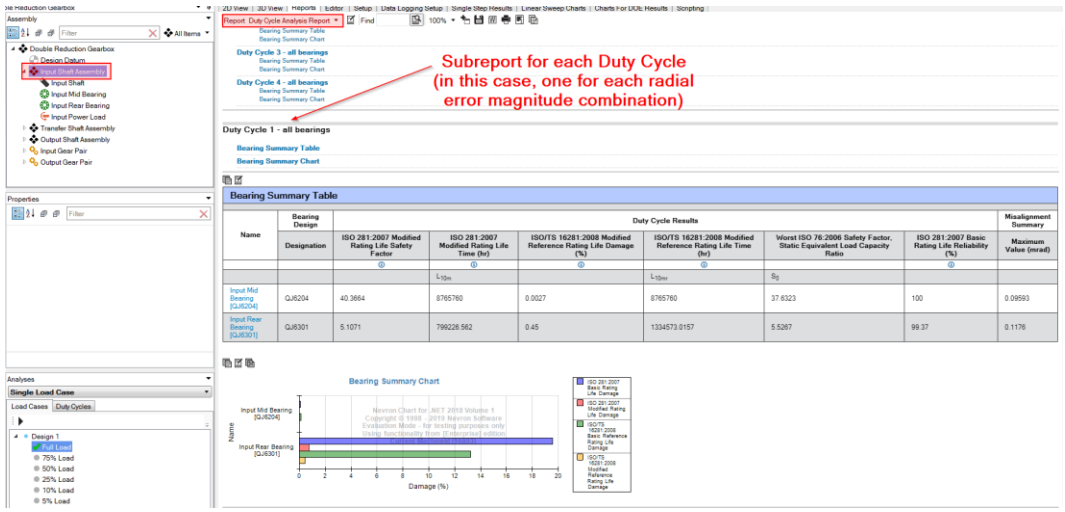
In PST mode, with a single load case selected, select the Design of Experiments study type. In the Setup tab add, for example, speed and torque on the input power load, define values and set their group to Duty Cycle. Input parameters which are not part of the duty cycle can also be added here.

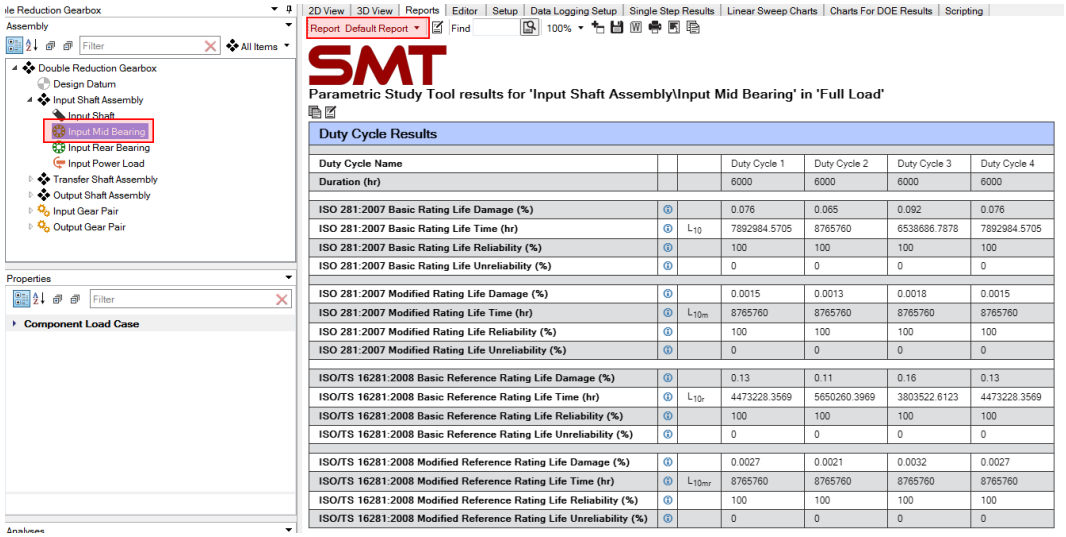
Selected Parameters

Entity Name	Parameter Name	Unit	Current Values	Set Values	Group
Input Power Load	Component Load Case\Speed	(rev/min)	1000, 1110.1695, ... 7500	Set Values	Duty Cycle
Input Power Load	Component Load Case\Torque	(N.m)	10, 9.8644, ... 2	Set Values	Duty Cycle
Input Mid Bearing [QJ6204]	Component Design\Inner Support Detail\Radial Error Magnitude	(µm)	0, 100	Set Values	No Group
Input Mid Bearing [QJ6204]	Component Design\Outer Support Detail\Radial Error Magnitude	(µm)	0, 100	Set Values	No Group

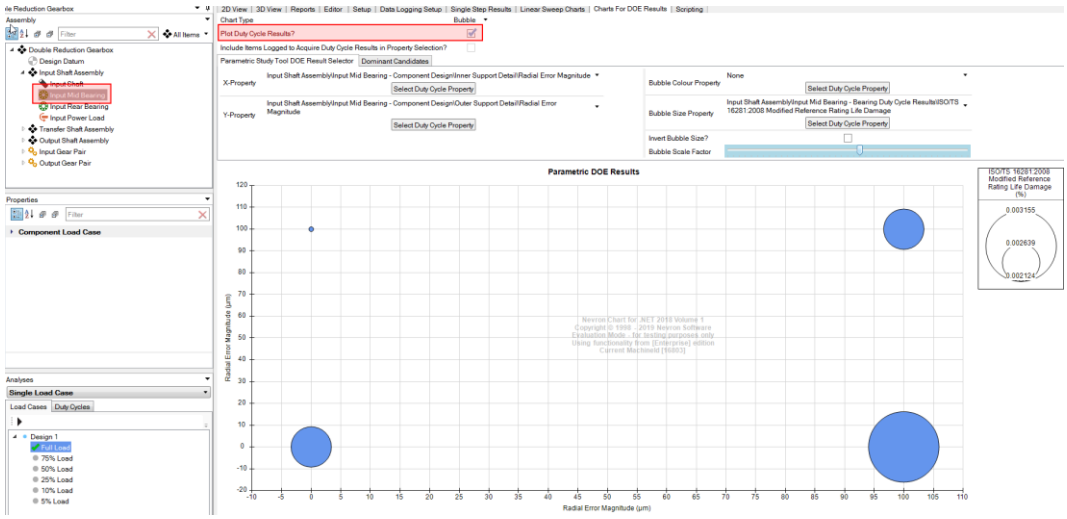
Duty cycle results will automatically be logged but additional load case results can be added for logging via the Data Logging Setup tab. Duty cycle results are available:

1. In the reports tab by either selecting an assembly (with the 'Duty Cycle Analysis Report' selected) or selecting an individual bearing:



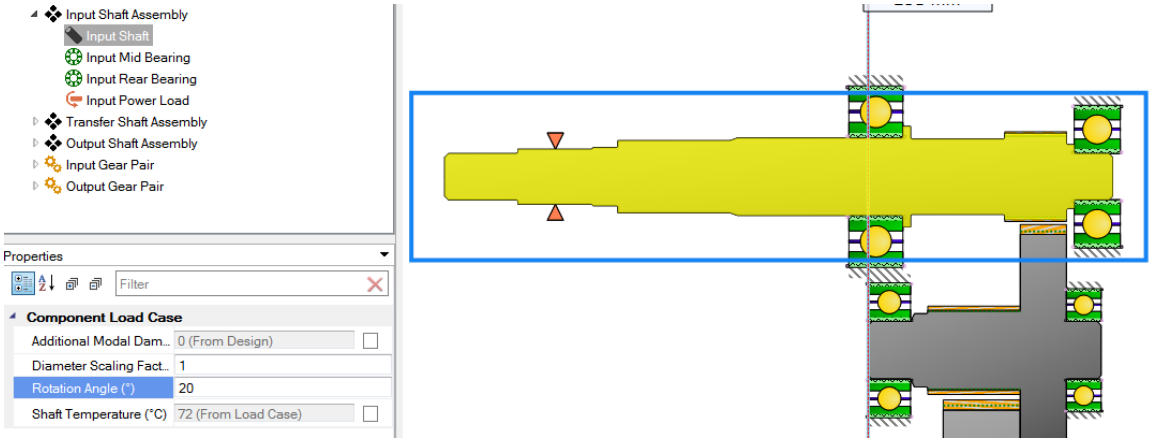


2. In the Charts For DOE Results tab by selecting the “Plot Duty Cycle Results” option:



2.4 Specify Component Rotation Angle in a Load Case

Specifying the rotation angle uses the calculated speed of the component from the Power Flow analysis to set the ‘Current Time’ property of the load case.

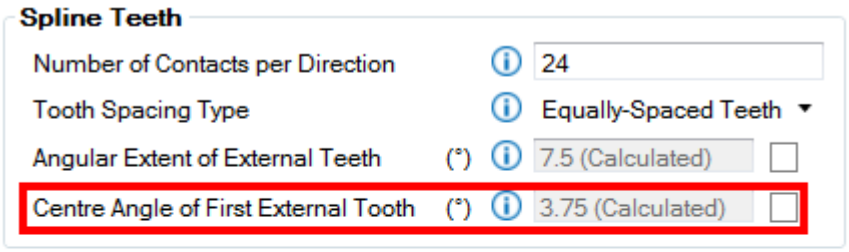


If the Power Flow has not been run yet for the load case then the angle will be shown as Unknown. When the value is set the Power Flow will be run in order to set the value.

2.5 Flexible Spline Improvements

2.5.1 Specify position of first tooth

For equally spaced teeth you can now specify the angle of the first tooth. This setting will rotate all spline teeth around by the specified angle.



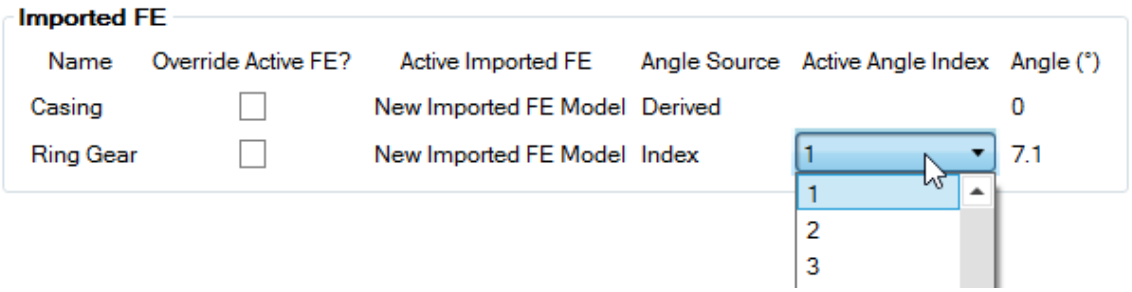
External Spline Half - Tooth Locations

Name	Start Angle (°)	End Angle (°)	Centre Angle (°)	Extent (°)
Tooth 1	0	7.5	3.75	7.5
Tooth 2	15	22.5	18.75	7.5
Tooth 3	30	37.5	33.75	7.5
Tooth 4	45	52.5	48.75	7.5
Tooth 5	60	67.5	63.75	7.5

2.5.2 Change in Alignment with FE

In previous releases the position of the spline teeth would be rotated on a shaft to match the node positions of the FE component. However, this made it difficult to fix the position of the spline teeth relative to other components. From this version the position of the spline teeth will always be as specified on the design and rotated when changing the load case time or running Advanced System Deflection.

An FE that connects to a flexible spline will now have an angle option listing the possible angles that match the spline tooth positions. If the external and internal teeth are the same size then care must be taken to pick the correct alignment.



To analyse different rotations of the spline the user should change the 'Current Time' of the load case. This can easily be done by using the new rotation angle property also added in this release.

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