

## Autodesk.Revit.DB.ResultsBuilder new Namespace

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This namespace contains interfaces and classes used for both storing and querying results. They are used by both results providers and results consumers.

In order to use these interfaces and classes adding reference to ResultsBuilder is necessary.

### Results Access

Creating ResultsAccess is the first thing to do if someone wants to use (store or query) results in Revit.

- ResultsAccess CreateResultsAccess object is designed for storing results of various analyses in the document.

Main properties of the ResultsAccess.

- Document Provides access to the document containing this package.
- ResultsDescriptors Provides access to the packages defined in current document.
- ResultsPackages Provides access to the packages defined in current document.

Methods used to access results packages.

- GetResultsPackage(Guid) Returns packages of given guid or null if not exists.
- GetResultsPackage(String) Returns packages of given name or null if not exists.
- GetResultsPackageDescriptor(Guid) Gets the results package descriptor.
- GetResultsPackageDescriptor(String) Gets the results package descriptor.

Methods used to manage results packages.

- CreateResultsPackage(ResultsPackageDescriptor) Creates the results package from descriptor.
- CreateResultsPackage(Guid, String, UnitsSystem, ResultsPackageTypes) Create new instance of ResultsPackageBuilder.
- DeleteResultsPackage(Guid) Deletes results packages of given guid from the document
- UpdateResultsPackage Update existing results package.

Events.

- PackagesAdded Subscribe to the PackagesAdded event to be notified that results package has been added.
- PackagesDeleted Subscribe to the PackagesDeleted event to be notified that results package has been deleted.
- PackagesStatusChanged Subscribe to the PackagesStatusChanged event to be notified that results package status has been changed.

### Results Package

Several new classes used during results package creation are defined.

- ResultsPackage Analysis class provides access to the results of analysis.
- MeasurementDescription MeasurementDescription describes the measurement defined in the package.

Classes used when accessing/querying results.

Base class.

- BaseGraph Base class for various types of results returned by ResultsBuilder.

Bars.

- LineGraph Represents two-dimensional line graph defined by the ordered set of pairs (U,V(U)).
- LineGraphByCoordinatesParameters Contains settings for calculating results on linear elements.
- LineGraphByDivisionParameters Contains settings for calculating results on linear elements.
- LineGraphEnvelope Represents envelope of line graphs.

- LineGraphParameters Base class for various types of settings used for calculating linear results.
- BarNodeResult Represents result value of specified type for given node.
- BarNodeResultEnvelope Represents result envelope values of specified type for given node.

Surfaces.

- SurfaceGraph Represents planar map of Points defined by the set of triples (valueX,valueY,values(valueX,valueY))
- SurfaceGraphEnvelope Represents envelope of surface graphs.
- SurfaceGraphParameters Class for various types of settings used for calculating results on surfaces.
- SurfaceNodeResult Represents result value of specified type for given node.
- SurfaceNodeResultEnvelope Represents result envelope values of specified type for given node.

Other classes.

- PointResults Defines a set of standard results in the calculation point.
- NodeReactions Defines a set of standard results in the calculation point supported on elastic ground.
- NodeResult Represents XYZ result value of specified type for given node.
- NodeResultEnvelope Represents envelope of result value for given node.
- NodeResults Defines a set of results for node.
- StoreyResults Contains values calculated for each storey.
- SurfaceReducedResults Contains reduced results for surface element.

## Autodesk.Revit.DB.ResultsBuilder.Storage new Namespace

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This namespace contains interfaces and classes used for storing results in Revit model only. They are used only by results providers.

In order to use these interfaces and classes adding reference to ResultsBuilder is necessary.

### Building results packages

Several new classes used during results package creation are defined.

ResultsPackageBuilder class returned by ResultsAccess.CreateResultsPackage method.

- ResultsPackageBuilder AnalysisBuilder class is used to create the Analysis object.

Classes used for bar results creation.

- BarPointProperties BarPointProperties class is used to define properties of tapered sections.
- BarPointResults defines a set of standard results in the calculation point along the linear element like beam or column.
- BarResultsBase base class for definition of results for linear elements.
- BarResultsByPoints defines the set of analytical results for linear element that is interpreted as diagram drawn between given points.
- BarNodeResults Defines a set of reactions in the specified point along the linear element like beam or column.
- BarResultsInNodes Defines a list of reactions on linear element.

Classes used for surface results creation.

- SurfacePointResults defines a set of standard results in the calculation point contained in the surface element like floor or wall.
- SurfaceResults defines a set of results for surface.
- SurfaceNodeResults Defines a set of reactions in the calculation point contained in the surface element like floor or wall.

Properties used for calculating derivative results for bars and surfaces.

- BarProperties defines a set of properties that are used for calculating derivative results.
- BarTaperedProperties set of properties of tapered section.
- SurfaceProperties defines a set of properties that are used for calculating derivative results.

## ResultsPackageBuilder members

Several new classes are defined to support results package creation.

Methods for results package identification.

- SetAnalysisName sets the Analysis Name of package.
- SetAnalysisInfo Sets the Analysis Info of package.
- SetCreationTime sets the creation time of package.
- SetDescription sets the Description of package.
- SetDesignOptionId sets the design option id for which the analysis was performed.
- SetModelId sets the Model Guid of package.
- SetModelName sets the Model Name of package.
- SetModelInfo Sets the Model Info of package.
- SetPassword Set password to protect package against modifying.
- SetPhaseId sets the phase id for which the analysis was performed.
- SetProviderName Sets the Provider Name of package.
- SetResultsStatus sets results status.
- SetVendorDescription sets the Vendor Description of package.
- SetVendorId sets the Vendor Id of package.

Methods for setting results.

- SetArbitraryResult function sets specified arbitrary result.
- SetBarResult function sets specified bar results.
- SetBarResults function sets bar results.
- SetNodeResults sets node results for element.
- SetStoreyResults sets results for storey.
- SetSurfaceResult function sets specified surface results.
- SetSurfaceResults sets forces for surface element.

Methods for setting properties needed for derivative results calculations.

- SetBarSectionProperties sets the properties of analytical linear element, that were used for analysis. This set of properties will be used for derivative results calculations.
- SetSurfaceSectionProperties sets the properties of analytical surface element, that were used for analysis. This set of properties will be used for derivative results calculations.

Additional methods.

- AddMeasurement method creates the additional type of results. It allows to define types of results that are not standard within the static analysis scope. The Name and measurementResultType pair must be unique in the package.
- Finish finishes building of analyses package and returns newly created ResultsPackage object.