C++ IO support for various FEM exchange file formats Nastran Bulk Data (BDF) IO support for C++ DNV GL Seasam Input Interface File (FEM) IO support for C++

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1 Supported FEM file formats

Not all functionality defined for the exchange file formats is supported. The supported subset is currently mainly defined by the functionality supported in GLFrame rspt. the BMF file format.

More detailed information on supported functionality can be found in the according directories in the doc dubdirectory.

1.1 NASTRAN Bulk Data Format (BDF)

1.1.1 BDF Cards supported

	Name	Description	Read	Write
General				
	`MAT1`	Material definition	✓	
	`GRID`	Grid nodes	✓	
Elements				
	`CTRIA3`	3 node shaped shell elements	✓	
	`CQUAD4`	4 node shaped shell elements	✓	
	`CBEAM`	Complex beams	✓	
	`CBAR`	Simple beams	✓	✓
	`CROD`	Trusses	✓	
Element	properties			
	`PSHELL`	Properties for `CTRIA3`, and `CQUAD4`	✓	
	`PBEAM`	Integral properties for `CBEAM`	✓	
	`PBEAML`	Properties for `CBEAM` describing cross section	✓	
	`PBAR`	Integral properties for `CBAR`	✓	
	`PBARL`	Properties for `CBAR` describing cross section	✓	
	`PROD`	Properties for `CROD`	✓	
Load				
	`LOAD`	Load case combination	✓	
	`FORCE`	Forces on Nodes	✓	✓
	`MOMENT`	Moments on Nodes	✓	✓
Misc				
	`ENDDATA`	Marker for end of input file	✓	✓

1.2 DNV GL Seasam Input Interface File (FEM)

1.2.1 FEM Cards supported

	Name	Description	Read	Write	Page[1]
General					
	DATE	Date and Program Information	✓	✓	4-2
	GNODE	Correspondence between External and Internal Node Numbering, and Number of Degrees of Freedom of Each Node			6-80
	GCOORD	Nodal Coordinates			6-56
	IDENT	Identification of Superelements	✓	✓	4-3
Elements					
	GELMNT1	Element Data Definition			6-65
	GELREF1	Reference to Element Data			6-66
Element	properties				
	GBARM	Cross Section Type Massive Bar			6-48
	GBEAMG	General Beam Element Data			6-49
	GECCEN	Eccentricities			6-61
	GELTH	Thickness of Two-dimensional Elements			6-70
	GIORH	Cross Section Type I or H Beam			6-71
	GLSEC	Cross Section Type L-Section			6-76
	GPIPE	Cross Section Type Tube			6-81
Load					
	BLDEP	Nodes with Linear Dependence			6-27
	BNBCD	Nodes with Boundary Conditions			6-30
	BNDISPL	Nodes with Prescribed Displacements and Accelerations			6-31
	BNLOAD	Nodes with Loads			6-35
	MGSPRNG	Element to Ground			6-103
Misc					
	IEND	End of a Superelement			4-4
	GSETMEMB	Set (group) of Nodes or Elements (Members)			6-84
	GUNIVEC	Specification of Local Element Coordinate System			6-92
	MISOSEL	Isotropy, Linear Elastic Structural Analysis			6-115
	TDSETNAM	Name and Description of a Set (group)			4-7
	TEXT	User supplied Text	✓	✓	4-10
	TDLOAD	**not documented**			

[1] References page in "Technical Reoprt: Sesam Input Interface File, File Description", Document id: 89-7012, Revision Number 9 / 01 November 1996