
Procedure IMPR_RESU with the format “IDEAS”

1 Drank

To write a mesh and/or the results of a computation on a file with the format “IDEAS”.

Currently this procedure makes it possible to write with the choice:

- a mesh,
- fields at nodes (of static displacements, temperatures, eigen modes, modes,...),
- fields by elements with the nodes or Gauss points (of stresses, generalized forces, local variables...), if these fields by elements do not have under points.

For the concepts of the type `RESULT`, one can print only part of information, by selecting the fields and the sequence numbers which one wishes to exploit.

It is possible to select the topological entities (nodes, meshes, nodes groups and mesh groups) on which one wants to print the results. The selection is not possible for the printing of the mesh.

2 Syntax

```

IMPR_RESU  (
  ◇ MODELE=MO           ,                               [model]
  ◇ FORMAT=/           "IDEAS",
  ◆VERSION=/           4,                               [DEFAULT]
  /           / 5,                                     [DEFAULT]
  ◆ UNITE =30 ,                               [DEFAULT]
  ◇RESU=  _F (
    ◆ |  MAILLAGE=MA           , / [mesh]
      /                               / [squelette]
    |  /CHAM_GD=CH_GD           ,
    |  /RESULTAT           =RESU ,
    # Extraction of a field of variables of resu
    ◇/TOUT_CHAM=/           "OUI", [DEFAULT]
      /"NON",
      /NOM_CHAM           =L_NOMSYMB , [1_K16]
      ◇/TOUT_ORDRE=' OUI', [DEFAULT]
      /NUME_ORDRE           =LORDRE , [1_I]
      /LIST_ORDRE           =LENTI , [listis]
      /NUME_MODE           =LMODE , [1_I]
      /NOEUD_CMP           =LNOECMP , [1_K16]
      /NOM_CAS           =NCAS , [1_K16]
      /ANGLE           =LANGL , [1_K16]
      //FREQ           =LFREQ , [1_R]
      /LIST_FREQ           =LREEL , [listr8]
      /INST           =LINST , [1_R]
      /LIST_INST           =LREEL , [listr8]
      ◇ |  PRECISION=/  PREC, [R]
      /1.0D-3, [DEFAULT]
      |  CRITERE = "RELATIF", [DEFAULT]
      /"ABSOLU",
    # Selection of the components
      ◇/TOUT_CMP=' OUI',
  [DEFAULT]
      /NOM_CMP           =L_NOMCMP , [1_K8]
    # Selection of topological entities
      ◇/TOUT=' OUI',
  [DEFAULT]
      / |  NOEUD=L_NOEU , [1_noeud]
      |  GROUP_NO=L_GRNO , [1_gr_noeud]
      |  MAILLE=L_MAILLE , [1_maille]
      |  GROUP_MA=L_GRMA ,
  [1_gr_maille]

```

```
        ◇SOUS_TITER=L_ST          ,          [l_Kn]  
    )  
)
```

3 Formats of writing

procedure IMPR_RESU makes it possible to write values in a file with the format I-DEAS™, software marketed by company EDS/UGS, for a graphic visualization.

3.1 Operands **FORMAT** / **VERSION**

operand **FORMAT** makes it possible to specify the format of printing and is compulsory in the case of a printing to format I-DEAS™.

Operand **FORMAT** makes it possible to ask for the creation of a file ASCII, known as “universal file” (of `.unv type` or `.msup`), which could be read again by I - DEAS™.

The universal file used by software I-DEAS™, has a data-processing structure different according to the version from software I-DEAS™. Operand **VERSION** makes it possible to specify the version of I-DEAS™ which one wishes to use. This operand is thus licit only when operand **FORMAT** is worth “IDEAS”. The authorized versions are version 4 and version 5 of I-DEAS™.

By default, the printing is done in version 5.

Example: IMPR_RESU (RESU= (_F (FORMAT= "IDEAS",
 VERSION= 4, )))

The upward compatibility of the versions of I-DEAS™ is ensured from version 5. One can thus use the versions higher than version 5 of I-DEAS™ with files written in version 5 (because any version N of I-DEAS™ can read again the files created by the N-1 version).

3.2 Logical operand

UNITE Unit of the written file (30 per default, which corresponds to the number by default of the mesh files of the `.unv type` in ASTK).

4 Key word **RESU**

This key word factor makes it possible to specify the results to print and the format according to which one wants to print them.

5 Printing of mesh: operands **MAILLAGE** / **MODELS**

the operand “**MAILLAGE**” makes it possible to print the mesh with format I-DEAS™. The printing of the mesh can be required only once and before very other result. By default one prints all the mesh.

One can however reduce the printing of the mesh to only meshes of the mesh supporting a finite element by defining the **MODEL** operand. So concept of the `model type` is optional in the majority of the printings. However, it can be used to print only the part of the mesh of which meshes are affected in the model.

In addition, with the format “IDEAS” when the **MODEL** key word is provided one seeks the type of finite element I - DEAS™ nearest to that of *Code_Aster*, if not a kind of finite element by default are affected in universal file I-DEAS™.

With the format “IDEAS”, the numbers of the nodes are that of *Code_Aster* except when the mesh is resulting from software I-DEAS™ (one line checks the presence of the character string AUTEUR=INTERFACE_IDEAS in the first of the title of the mesh and from the tenth position); in this case one restores classification I-DEAS™.

Note:

- 1) Meshes 3D of type PYRAM5 and PYRAM13 are not available under I-DEAS. These meshes are thus not written in the universal file created by the command `IMPR_RESU` with the format `IDEAS`.
- 2) The mesh 3D of type HEXA27 is not available under I-DEAS. Meshes the Aster of this type are converted into meshes type HEXA20 in the universal file created by the command `IMPR_RESU` with the format `IDEAS`.

6 Operands CHAM_GD and RESULTAT

the values of the computed fields are stored in data structures called fields of variables. These fields of variables can be directly accessible (concept `CHAM_GD`) where to be in a data structure gathering several fields of variables (result concept).

- A field of variables is a data structure which makes it possible to store fields defined in the nodes (`cham_no_*`) or fields defined by elements (`cham_elem_*`). For the fields by elements, one and the distinguishes the fields defined in the nodes from the elements fields defined in Gauss points of the elements.
- A result concept is composed of one or more fields of variables. For example, with each computation step one stores in data structure `result`, the field of variables displacement. This structure is thus a matrix structure of order 2, whose index is, for example, the list of times of computation and the other all the computed fields (displacements, stresses, strains,...).

One reaches in this case a field of variables by specifying a value of a variable of access (sequence number, time, frequency, number of mode,...) and a field name ("DEPL", "SIGM_ELNO",...). There exist several types of result concept: `evol_elas`, `evol_noli`, `mode_meca`,.... A each one corresponds a list of fields and a list of licit variables of access.

Taking into account data structure `result`, one understands easily that the possibilities of printing which one lays out are those of the fields of variables, supplemented by specific possibilities.

Note:

- 1) Meshes 3D of type PYRAM5 and PYRAM13 are not available under I-DEAS. The values of the fields Aster associated with these meshes are thus not written in the universal file created by the command `IMPR_RESU` with the format `IDEAS`.
- 2) The mesh 3D of type HEXA27 is not available under I-DEAS. The values of the fields Aster calculated on this kind of mesh are written on meshes of type HEXA20; it is - with - to say that one transfers only the values from the fields Aster on the first 20 nodes.

6.1 Operand CHAM_GD

the values of the fields of variables are written in one or more datasets of the universal file:

- dataset 55 for the fields at nodes,
- dataset 57 for the fields by element with the nodes,
- dataset 56 for the fields by elements with Gauss points (in fact, one writes constant fields by element while realising on Gauss points).

In I-DEAS™, some datasets is typified: displacements, stresses, strains, temperature, pressure. One thus gathers the components in order to write the typified datasets, then one writes the other components in datasets of the type "UNKNOWN".

The datasets of the type "UNKNOWN" contain to the maximum six components; for a field of variables of N components one thus writes n/6 datasets.

6.2 Operand RESULTAT

operand `RESULTAT` makes it possible to print the fields contained in a result concept. One can for example choose to print only certain fields (cf the key word: `NOM_CHAM`).

Warning : The translation process used on this website is a "Machine Translation". It may be imprecise and inaccurate in whole or in part and is provided as a convenience.

The result concept is written field of variables by field of variables in datasets 55,56 or 57.

7 Extraction of a field of variables

7.1 Operands TOUT_CHAM/NOM_CHAM

C F. document [U4.71.00].

7.2 Operands

TOUT_ORDRE/NUME_ORDRE/LIST_ORDRE/NUME_MODE/INST/LIST_I
NST/FREQ/LIST_FREQ/NOEUD_CMP/NOM_CAS/ANGLE/accuracy/CR
ITERE

cf document [U4.71.00].

8 Selection on the components

In order to reduce the volume of the printings and the size of “universal” file I-DEAS™, the user can print only the values of certain components (for example that displacement following the axis X: component DX or that stress XX: component SIXX).

8.1 Operand TOUT_CMP

This key word makes it possible to indicate that one wishes to print all the components of the field. It is the value by default.

8.2 Operand NOM_CMP

This key word makes it possible to choose the list of the components CHAM_GD or all the fields of result concept which one wishes to print.

Key keys TOUT_CMP and NOM_CMP cannot be used simultaneously.

When the user specifies key word NOM_CMP, the datasets create in the universal file are typified UNKNOWN, which will prohibit the user from tracing deformed (even if the dataset contains the components DX, DY, DZ, DRX, DRY, DRZ) and of the computation of the criteria of Von Mises and/or Tresca (even if the dataset contains components SIXX, SIYY,... SIXZ).

This functionality makes it possible to choose the components, as well for cham_no as of the cham_elem with actual values.

Operand NOM_CMP is not programmed for the cham_no and cham_elem with complex values.

9 Selection of the topological entities

In order to reduce the volume of the printings and the size of “universal” file I-DEAS™, it is sometimes necessary to print only part of result. With this intention one can wish to print a field at nodes only in some nodes, or a field by element that in certain elements.

This selection which one will note “selection on topological entities” is possible with the format “IDEAS”.

9.1 Operand TOUT

This key word indicates that one wishes to print the field on all the structure (all the nodes for a field at nodes, all elements for a field by element).

9.2 Operand NOEUD

This key word makes it possible to indicate the list of the nodes on which one wishes to print a `cham_no`. If this key word is used in the case of the printing of a `cham_elem`, he is ignored, and the `cham_elem` is printed in all meshes specified in addition.

9.3 Operand GROUP_NO

This key word makes it possible to indicate the list of the nodes groups on which one wishes to print a `cham_no`. If this key word is used in the case of the printing of a `cham_elem`, he is ignored, and the `cham_elem` is printed in all meshes, specified in addition.

9.4 Operand NETS

This key word makes it possible to indicate the list of meshes on which one wishes to print a `cham_elem`. For a `cham_no`, it makes it possible to indicate the list of the nodes, tops of meshes to which one wishes to print the `cham_no`.

9.5 Operand GROUP_MA

This key word makes it possible to indicate the list of the mesh groups on which one wishes to print a `cham_elem`. For a `cham_no`, it makes it possible to indicate the list of the nodes, tops of meshes to which one wishes to print the `cham_no`.

10 Operand SOUS_TITRE

This argument makes it possible to print under title of comment, for more details to consult the document [U4.03.01].

The `SOUS_TITRE` by default is:

- for a `cham_gd`
 - for a `cham_no`
`SOUS_TITRE = ("Field at nodes")`
 - for a `cham_elem`
`SOUS_TITRE = ("FIELD PAR ELEMENT &LOC (cham_elem)")`

Example:

```
FIELD PAR ELEMENT WITH Gauss points
```

- for result
 - for a `cham_no`
`SOUS_TITRE = ("Field at nodes",
"OF Symbolic name &NOM_SYMB (Result cham_no) &RL",
"NUMERO D '' ORDRE &NUM_ORDRE (Result cham_no)",
"&ACCES (Result cham_no)")`

Example of printing:

```
FIELD AT NODES OF SYMBOLIC NAME DEPL  
SEQUENCE NUMBER: 2 NUME_MODE: 3
```

FREQ: 5.52739E+00

- for a cham_elem
SOUS_TITRE = ("FIELD PAR ELEMENT &LOC (Result cham_elem)",
"OF Symbolic name &NOM_SYMB (Result cham_elem) &RL",
"NUMERO D ' ' ORDRE &NUM_ORDRE (Result cham_elem)",
"&ACCES (Result cham_elem)")

Example of printing:

```
FIELD PAR ELEMENT WITH THE NODES OF SYMBOLIC NAME  
EPSI_ELNO SEQUENCE NUMBER: 1 INST:  
0.000000E+00
```

11 Remark

In Aster, there exist fields by elements with under points (as well for fields by elements with the nodes as for fields by elements with Gauss points).

The format "IDEAS", IMPR_RESU do not allow the printing of these fields by elements with under points.