

Operator LIRE_MAILLAGE

1 Goal

To create a grid by reading on a file.
S FormatS of supported files are: ASTER, MED, GIBI, GMSH and IDEAS.

Product a structure of data of the type `grid`.

Notice important:

One can check the quality of the grid read while using (following LIRE_MAILLAGE, the order MACR_INFO_MAIL [U7.03.02].

2 Syntax

```
my [grid] = LIRE_MALLAGE

( ◇ UNIT = / 20 , [DEFECT]
  / I , [I]

  ◇ FORMAT = / `MED ` , [DEFECT]
  / `ASTER ` ,
  / `GIBI ` ,
  / `GMSH ` ,
  / `IDEAS ` ,
  # If FORMAT=' MEOf
  ◇ NOM_MED = mamed , [ K*]
  ◇ INFO_MED = / 1, [DEFECT]
  / 2,
  / 3,
  # If FORMAT='IDEAS `
  ◇ CREA_GROUP_COUL = / `NOT` , [DEFECT]
  / `YES` ,

  ◇ VERI_MAIL = _F (
    ◇ VERIF = / `YES` , [DEFECT]
    / `NOT` , ),
    ◇ FLAT TINT = / 1.D-3 , [DEFECT]
    / ap , [R]

  ◇ INFORMATION = / 1 ,
  [DEFECT]
  / 2 ,

)
```

3 Operands

3.1 Operand UNIT

◇ UNIT = I

Logical number of unit of the file grid. Unit 20 by defaults.

3.2 Operand FORMAT

◇ FORMAT = / 'MED' [DEFECT]
/ 'ASTER'

This keyword is used to specify the format of the file to reading. Today two formats are supported : 'MED' and 'ASTER'.

The format 'ASTER' is described in [U3.01.00].

The format 'MED' who means "Modeling and Data exchanges" are a neutral format of data developed by EDF R & D and the ECA for the data exchanges between computer codes. The data which one can exchange according to this format are the grids and the fields of results: fields with the nodes, fields by element. Files MED are binary and portable files (being pressed on the library HDF, Hierarchical Dated Format). Reading of a file MED by LIRE_MAILLAGE, allows to recover a grid produced by any other code able to create a file MED. It is the format advised in **code_aster** and that by default.

Whatever the format, Lbe given read are:

- the list of the nodes number, name, coordinated,
- the list of the meshes number, name, type, name of the nodes,
- the list of the groups of nodes number, name, many nodes, names of the nodes,
- the list of the groups of meshes number, name, many meshes, names of the meshes.

Foot-note:

In a file MED, there is partition of Nœuds and of the meshes according to the groups. A partition corresponds to a family MED. In a file MED, the groups are distributed within the families: families of N there are thus foundœuds and of the families of meshes. During the reading of a file MED, lists of the groups of Nœuds and of meshes is made up with the flight by decomposition of the families.

3.3 Operand VERI_MAIL

The keyword VERI_MAIL start 3 checks on the grid:

- absence of orphan nodes,
- absence of meshes "in double",
- absence of too flattened meshes.

If these checks are not satisfied, the code emits an alarm.

By default (i.e. in the absence of the keyword VERI_MAIL), the checks are made. If the user wants to avoid these checks, he will write:

```
VERI_MAIL = _F (VERIF = 'NOT',),
```

A node is declared orphan if he does not belong to the connectivity of any mesh.

A mesh is declared "in double", if 2 meshes (or more) have the connectivities formed by the same list of nodes.

The keyword FLAT TINT = ap allows to emit alarms when the grid contains too flattened meshes.

The flatness of a mesh is defined like the report A_{min}/A_{max} where A_{min} and A_{max} are the lengths of stop shortest and longest of the mesh. The name of the meshes whose flatness is lower than ap will be printed on the file 'MESSAGE'.

Other quality standards for the grid are available via the order `MACR_INFO_MAIL` [U7.03.02].

3.4 Operands for the format 'MED'

◇ `NOM_MED = mamed,`

A file MED can contain several grids. Each grid is located by its name. To read a grid in particular, it is necessary to provide its name in argument of this keyword `NOM_MED`. In the absence of keyword, the first grid found in the file will be read. When it file contains only one grid, there is thus nothing to specify.

Note:

- *In a grid, a group of meshes can be made up of elements of differentS dimensionS (edges, faces or volumes).*
- *This kind of group is displayed in Salomé (Mesh module) like several groups carrying it even name under various categories, but does it of it is only one group in code_aster.*

◇ `INFO_MED = / 1, [DEFECT]
/ 2,
/ 3,`

Print information specific on the course of the second reading of the file of grid MED (number of nodes and meshes read again, information on families MED,...) :

- `INFO_MED = 1` : no impression,
- `INFO_MED = 2` : only impressions relating to the correspondence family/group,
- `INFO_MED = 3` : the totality of information are printed.

3.5 Operand S for the format 'IDEAS'

◇ `CREA_GROUP_COUL`

The user can ask for the creation of groups of meshes and nodes gathering all of the same meshes and nodes color while indicating `CREA_GROUP_COUL = 'YES'`. These groups are named `COUL_n` or `N` is the number of the color in IDEAS.

By default it is not made for unnecessarily not to increase the number of groups of meshes and nodes.

Note:

- *One treat only Cartesian frames of reference.*
- *One manage one Cartesian frame of reference.*
- *During the conversion of universal file IDEAS, one check if the user defined several frames of reference. If it is the case, a message of alarm informs the user of it, to require of him to check that all the frames of reference are identical.*

3.6 Operand INFORMATION

◇ `INFORMATION = / 1 , [DEFECT]
/ 2 ,`

Level of impression.

If: INFORMATION = 1

- title of the grid,
- many nodes,
- many meshes of each type,
- many groups of nodes and for each one of them its name and the number of nodes of the group
- many groups of meshes and for each one of them its name and the number of meshes of the group.

If: INFORMATION = 2 one prints besides information of INFORMATION = 1 :

list of the nodes	number, name, coordinated,
list of the meshes	number, name, type, name of the nodes,
list of the groups of nodes	number, name, many nodes, names of the nodes,
list of the groups of meshes	number, name, many meshes, names of the meshes.