

Structure of data sd_gfibre

Summary:

One describes the structure of data here `sd_gfibre` (produced by the order `DEFI_GEOM_FIBRE`). This order being the only one to produce it, one will use sometimes the vocabulary of this order to describe this structure of data.

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1 General information

The structure of data `sd_gfibre` (produced by the order `DEFI_GEOM_FIBRE`) the definition of one or more groups of fibres contains used by the “multifibre” elements. This structure of data consists of `nbgf` groups of fibres.

- Each group of fibres is defined by an occurrence of the one of the 3 keywords `SECTION`, `FIBRE`. and `ASSEMBLAGE_FIBRE`.
- Each group of fibres has a name given by the user.
- Each group of fibres contains a certain number of fibres `nbfib`.

2 Tree structure

```
sd_gfibre (K8):  
(O)  \.NOMS_GROUPES'      :  OJB  S   NR   K24 long=nbgf  
(O)  \.NB_FIBRE_GROUPE'  :  OJB  S   V   I   long=nbgf  
(O)  \.POINTEUR'         :  OJB  S   V   I   long=nbgf  
(O)  \.TYPE_GROUPE'      :  OJB  S   V   I   long=nbgf  
(O)  \.CARFI              :  OJB  S   V   R   long=nbcar*nbfib_tot  
(O)  \.GFMA               :  OJB  S   V   K8  long=1  
(O)  \.CARACSD           :  OJB  S   V   I   long=3
```

3 Contents of the objects Jveux

3.1 Definition of some variables

- `nbgf` : many groups of fibres, it is the number of occurrences of the keywords `SECTION`, `FIBRE` and `ASSEMBLAGE_FIBRE`.
- `nbcar (i)` : many characteristics of fibres of the type “i”. These values are in the object `CARACSD` structure of data.
- `nbfib` : many fibres of a group of fibres.
For an occurrence of `SECTION`, the number of fibres is the number of triangles (`TRIA3`) and of quadrangles (`QUAD4`) composing the section.
For an occurrence of `FIBRE`, the number of fibres is the length of the list provided behind the keyword `VALE` divided by “will `nbcar`” because one gives “will `nbcar`” characteristic by fibre.
For an occurrence of `ASSEMBLAGE_FIBRE`, the number of fibres is the sum amongst fibres of each group of fibres given under `GROUP_FIBRE`.
- `nbfib_tot` : full number of fibres of `sd_gfibre` (nap of the numbers of fibres of all the groups of fibres)
- `nbcar` : the maximum number of the characteristics related to a fibre: `nbcar = 7`.
For fibres of the type 1, `nbcar = 3` (`y`, `z`, `surface`).
For fibres of the type 2, `nbcar = 7` (`y`, `z`, `surface`, `yp`, `zp`, `gx`, `numasse`).

3.2 Object `.NOMS_GROUPES`

```
(O)  \.NOMS_GROUPES'      :  OJB  S   NR   K24 long=nbgf
```

This pointer of names contains the name of the groups of fibres, keywords `GROUP_FIBRE` or `GROUP_ASSE_FIBRE`.

3.3 Object `.NB_FIBRE_GROUPE`

```
(O)  \.NB_FIBRE_GROUPE'  :  OJB  S   V   I   long=nbgf
```

$V(igf) = nbfib$: many fibres of the group of fibres `igf`.

3.4 Object .POINTEUR

(O) \.POINTEUR' : OBJ S V I long=nbgf

$V(igf) = p_{fib}$: "addresses" in .CARFI from the 1^{era} fibre of the group of fibres igf

3.5 Object .TYPE_GROUPE

(O) \.TYPE_GROUPE' : OBJ S V I long=nbgf

Groups of fibres given by FIBRE and SECTION are of type 1. Groups of fibres given by ASSEMBLAGE_FIBRE are of type 2.

3.6 Object .CARFI

(O) \.CARFI' : OBJ S V R long=nbcar*nbfib_tot

This vector contains the characteristics of fibres.

The fibres are arranged by "groups of fibres".

For each fibre, one stores $nbcar$ characteristics:

For fibres of the type 1:

- y : 1^{era} coordinate of the centre of gravity of fibre.
- z : 2^{eme} coordinate of the centre of gravity of fibre.
- s : sectional surface of fibre.

For fibres of the type 2:

- y : 1^{era} coordinate of the centre of gravity of fibre.
- z : 2^{eme} coordinate of the centre of gravity of fibre.
- s : sectional surface of fibre.
- yp : 1^{era} coordinated centre of gravity of the group of fibre to which the fibre belongs.
- zp : 2^{eme} coordinated centre of gravity of the group of fibre to which the fibre belongs.
- Gx : characteristic of torsion of the group of fibre to which the fibre belongs.
- Num : number of the group of fibre.

That is to say:

- igf : number of the group of fibres
- k_{fib} : number of fibre (in its group)
- k : number of the characteristic (1.. $nbcar$)

then:

$ipoint = .POINTEUR(igf)$

$V(ipoint + nbcar(k_{fib} - 1) + k - 1)$ represent k^{eme} characteristic on $nbcar$ k_{fib}^{eme} fibre of the group of fibres igf .

3.7 Object .GFMA

(O) \.GFMA' : OBJ S V K8 LONG=1

The name of the total grid of section contains created by DEFI_GEOM_FIBRE.

3.8 Object .CARACSD

(O) \.CARACSD' : OBJ S V I long=3

Structural features of data:

- $V(1) = nbgf$: number of group of fibres.
- $V(2) = nbcar1$: many characteristics for fibres of the type 1.
- $V(3) = nbcar2$: many characteristics for fibres of the type 2.