

## Structure of data sd\_gfibre

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### 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.

## Contents

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<a href="#">1 General information.....</a>	<a href="#">3</a>
<a href="#">2 Tree structure.....</a>	<a href="#">3</a>
<a href="#">3 Contents of the objects Jeux.....</a>	<a href="#">3</a>
<a href="#">3.1 Definition of some variables.....</a>	<a href="#">3</a>
<a href="#">3.2 Object .NOMS_GROUPES.....</a>	<a href="#">3</a>
<a href="#">3.3 Object .NB_FIBRE_GROUPE.....</a>	<a href="#">3</a>
<a href="#">3.4 Object .POINTEUR.....</a>	<a href="#">4</a>
<a href="#">3.5 Object .TYPE_GROUPE.....</a>	<a href="#">4</a>
<a href="#">3.6 Object .CARFI.....</a>	<a href="#">4</a>
<a href="#">3.7 Object .GFMA.....</a>	<a href="#">4</a>
<a href="#">3.8 Object .CARACSD.....</a>	<a href="#">4</a>

## 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<sub>m</sub>* : the maximum number of the characteristics related to a fibre: *nbcar<sub>m</sub>* = 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<sup>era</sup> 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=nbcarm\*nbfib\_tot

This vector contains the characteristics of fibres.

The fibres are arranged by "groups of fibres".

For each fibre, one stores  $nbcarm$  characteristics:

For fibres of the type 1:

- $y$  : 1<sup>era</sup> coordinate of the centre of gravity of fibre.
- $z$  : 2<sup>eme</sup> coordinate of the centre of gravity of fibre.
- $s$  : sectional surface of fibre.

For fibres of the type 2:

- $y$  : 1<sup>era</sup> coordinate of the centre of gravity of fibre.
- $z$  : 2<sup>eme</sup> coordinate of the centre of gravity of fibre.
- $s$  : sectional surface of fibre.
- $yp$  : 1<sup>era</sup> coordinated centre of gravity of the group of fibre to which the fibre belongs.
- $zp$  : 2<sup>eme</sup> 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..  $nbcarm$ )

then:

$ipoint = .POINTEUR(igf)$

$V(ipoint + nbcarm(k_{fib} - 1) + k - 1)$  represent  $k^{eme}$  characteristic on  $nbcarm$   $k_{fib}^{eme}$  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.
- $V(2) = nbcarm1$  : many characteristics for fibres of the type 1.
- $V(3) = nbcarm2$  : many characteristics for fibres of the type 2.