

**Manuel d'Utilisation**  
**U4.0- booklet: Use of the orders**  
**Document: U4.01.02**

## Innovations and modifications in the orders

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### Summary:

The object of this document is to give a comprehensive view of the modifications of syntax and new opportunities of the orders of *Code\_Aster* between two stabilized versions. This update thus mentions changes introduced since **version 6.3** from April 2002 and valid for **version 6.4** from November 2002.

For more precise details, one will consult the documentation of the orders and the file `histor` under - corresponding version (e.g.: [6.3.12], section *Development* site `www.code-aster.org`). The impacted orders are listed alphabetically.

## 1 Innovations between versions 6.3 and 6.4

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### 1.1 New orders

#### 1.1.1 GENE\_MATR\_ALEA

This order makes it possible to produce positive definite symmetrical matrices random starting from an average matrix and of a level of uncertainty. Three laws of probability are available (cf [6.3.12]).

#### 1.1.2 GENE\_VARI\_ALEA

Even object that the preceding order for real variables (cf [6.3.12]).

#### 1.1.3 LIRE\_TABLE

This new order makes it possible to read again a table which was printed by IMPR\_TABLE (cf [6.3.13]).

#### 1.1.4 MACR\_LIGN\_COUPE

This macro facilitates the postprocessing of mechanical results and thermics by recording the values of a field to the nodes on a line of cut (grid of segments) (cf [6.3.14]).

#### 1.1.5 MACR\_RECAL

This macro makes it possible to carry out retiming in *Code\_Aster* : the macro one determines the parameters of a calculation which describe as well as possible the tests (cf [6.3.18]).

### 1.2 Modified orders

#### 1.2.1 AFFE\_CHAR\_MECA

##### **LIAISON\_UNIL\_NO removed:**

- The features are henceforth available under the keyword CONTACT, except for the friction of TRESKA which is not available any more (cf [6.3.17]).

##### **REAC\_GEOM new, REAC\_GEOM\_INTE removed:**

- The keyword REAC\_GEOM allows to control the geometrical reactualization of the algorithm of contact, it is worth WITHOUT, AUTOMATIC or CONTROL. In this last case, it is necessary to specify the number of reactualizations imposed NB\_REAC\_GEOM (cf [6.3.10]).

##### **STOP\_SINGULIER new:**

- This gives the opportunity of continuing the resolution even if a singular matrix is detected (validity of the solution being conditioned with the checking of balance) (cf [6.3.16]).

##### **PROJECTION=' QUADRATIQUE ' new:**

- When the elements in contact are quadratic, this projection makes it possible to calculate exactly the game (cf [6.3.12]).

**DIRE\_APPA new:**

- For the method continues, the user thus imposes the direction of research of pairing (cf [6.3.14]).

**INTEGRATION= ( 'SIMPSON' , 'SIMPSON1' , 'SIMPSON2' ) new possible values:**

- For the method continues, this allows to specify the desired type of integration (cf [6.3.14]).

## 1.2.2 AFFE\_MODELE

### Modelings 2D\_CONTACT, 3D\_CONTACT removed:

- These modelings were applied to the elements of contact which were reabsorbed (see too AFFE\_CHAR\_MECA, cf [6.3.17]).

### Modelings CONT\_DVP\_2D, CONT\_DVP\_3D removed:

- The user is not constrained any more to affect modelings relating to the algorithm of contact only it chose, the code does it itself (These modelings are relating to the continuous method).

### Modelings 3D\_THVD, AXIS\_THVD, D\_PLAN\_THVD news:

- New thermohydraulic modelings (without mechanics) for the studies of storage (cf. STAT\_NON\_LINE and [6.3.15]).

### Modelings \*\_HMD, \*\_HHHD, \*\_THHD, \*\_THMD, \*\_THMD news:

- New diagonal modelings THM (cf [6.3.15]).

## 1.2.3 CALC\_ELEM

### VARI\_ELNO\_COQU new option:

- The option VARI\_ELNO\_COQU calculate the internal variables in a layer of elements of HULL, GRID or DKT (keyword NIVE\_COUCHE) starting from the internal variables calculated during a nonlinear calculation (cf [6.3.2]).

### VALE\_NCOU\_MAXI new option, keywords NOM\_CHAM and NOM\_CMP associated:

- This option makes it possible to extract the extreme values from the component of a field defined on elements pipes like their localization (cf [6.3.19]).

### CRIT\_ELNO\_RUPT new option:

- This option calculates 6 criteria of rupture in orthotropic materials (cf [6.3.7]).

### ETOT\_ELGA, ETOT\_ELNO\_ELGA, ETOT\_ELEM new options:

- These options calculate the density of total energy at the points of integration (ETOT\_ELGA), with the nodes (ETOT\_ELNO\_ELGA) and density of total energy integrated on the elements (ETOT\_ELEM) (cf [6.3.17]).

### TEMP\_INIT removed:

- This keyword was not used (cf [6.3.3]).

## 1.2.4 CALC\_FATIGUE

### TYPE\_CALCUL new:

- Allows to choose the type of fatigue analysis asked, is worth CUMUL\_DOMMAGE or FATIGUE\_MULTI.

### Keywords RESULT, CHAM\_MATER, CRITERION, METHOD new:

- To determine the plan in which shearing is maximum in axial fatigue analysis multi - (FATIGUE\_MULTI, cf [6.3.9]).

## 1.2.5 CALC\_FONCTION

### POWER new:

- Allows to calculate the nth power of a function (cf [6.3.12]).

### NORMALIZES new:

- Calculate the L2 standard of a function (cf [6.3.12]).

## **CORR\_ACCE new:**

- Allows to correct a real accélérogramme (cf [6.3.2]).

## **LISS\_ENVELOP new:**

- Calculate the spectrum envelope smoothed starting from a rough spectrum (cf [6.3.16]).

## **1.2.6 CALC\_G\_THETA\_T**

### **FOND\_FISS new:**

- In the past BOTTOM to homogenize the vocabulary with the other orders CALC\_G\_\* (cf [6.3.10]).

## **1.2.7 CALC\_META**

### **ETAT\_INIT/INST\_INIT new:**

- During a recovery, this keyword makes it possible to define the moment from which calculation will be continued (cf [6.3.19]).

## **1.2.8 CALC\_THETA**

### **FOND\_FISS new:**

- Idem CALC\_G\_THETA\_T.

## **1.2.9 COMB\_MATR\_ASSE**

### **CALC\_AMOR\_GENE new:**

- This built an object MATR\_ASSE\_GENE corresponding to the matrix of damping of BASILE starting from a list of reduced depreciation (cf [6.3.19]).

## **1.2.10 COMB\_SISM\_MODAL**

### **COMB\_DEPL\_APPUI new:**

- This keyword makes it possible to calculate the answers of the primary education loadings (seismic excitation) and secondaries (due to differential displacements of anchoring). It is necessary to define NUME\_CAS under DEPL\_MULT\_APPUI (cf [6.3.8]).

## **1.2.11 BEGINNING**

### **CODE/NIV\_PUB\_WEB new:**

- Under the keyword CODE (for the CAS-tests), NIV\_PUB\_WEB the level of diffusion of the test defines on the Web site of *Code\_Aster* (cf [6.3.6]).

## **1.2.12 DEFI\_MATERIAU**

### **TEMP\_DEF\_ALPHA obligatory:**

- The presence of this keyword is from now on obligatory if the dilation coefficient ALPHA depends on the temperature (cf [6.3.3]).

## **Withdrawn laws of behavior:**

- The following laws of behavior were withdrawn from the code because of their lack of qualification (cf [6.3.25]): OHNO, VISCOCHAB, VENDOCHAB, LMARC, NADAI\_B, SURF\_ETAT\_SATU, SURF\_ETAT\_NSAT, CAM\_CLAY\_THM, LIQU\_SATU\_GAT, LIQU\_NSAT\_GAT.

**EFFO\_N\_INIT modified:**

- This parameter, used with the discrete elements, can now depend on the temperature (cf [6.3.19]).

**BAZANT\_FD new:**

- Model of creep of dessication of Bazant (creep due to the drying of the concrete under mechanical loading) (cf [6.3.13]).

**MAZARS\_FO new:**

- Model of Mazars allowing to take into account the variation of the coefficients compared to the temperature (cf [6.3.18]).

## 1.2.13 DYNA\_NON\_LINE and STAT\_NON\_LINE

See DEFI\_MATERIAU for the laws of behaviors removed and added.

**KIT\_THV new:**

- New relation, without mechanics, for the studies of storage. The ddl are the water temperature and pressure; the steam pressure being an internal variable (cf [6.3.15]).

## 1.2.14 EXTR\_RESU

**SENSITIVITY new:**

- This makes it possible to exploit the sizes derived during the extraction from a result (cf [6.3.1]).

## 1.2.15 IMPR\_TABLE

**FORMAT=' ASTER ' new:**

- This keyword makes it possible to print a table with the format Aster, to see too LIRE\_TABLE (cf [6.3.13]).

## 1.2.16 LIRE\_MAILLAGE

**VERI\_MAIL by default:**

- By default, the checking of the grid is activated (orphan nodes, double meshes, flattened meshes...) (cf [6.3.3]).

## 1.2.17 LIRE\_MISS\_3D

**NAME new:**

- This makes it possible to define the name of the file in reading (cf [6.3.12]).

## 1.2.18 LIRE\_RESU

**MATR\_A, MATR\_B new:**

- One provides behind these keywords the matrices of rigidity and mass to be able to read again (and test) a mode obtained by DYNA\_TRAN\_MODAL (cf [6.3.19]).

**FORMAT=' MED ' new:**

- This makes it possible to read again results with format MED (recommended for the exchanges between computer codes EDF/CEA). For the moment, only the fields with the nodes are treated (cf [6.3.2]).

Keywords simple associates: NOM\_MED, NOM\_CMP, NOM\_CMP\_MED,  
NOM\_CMP\_IDEM, NOM\_MAIL\_MED, UNIT.



**DATASET\_58 new:**

- This format makes it possible to read again the abundant data by software of experimental measurement (cf [6.3.8]).

**1.2.19 MACR\_ADAP\_MAIL and MACR\_INFO\_CALC**

**VERSION\_HOMARD new value by default:**

- The version by default of LOBSTER is now v5\_5.

## 1.2.20 MACR\_ASCOUF\_CALC and MACR\_ASPIE\_CALC

### **PRESS\_LEVRE new:**

- This keyword makes it possible to apply or not the pressure interns on the lips of a crack emerging in internal skin (cf [6.3.19]).

## 1.2.21 MECA\_STATIQUE

### **SIEF\_ELGA\_DEPL by default:**

- This option is henceforth calculated by default. One can specify `OPTION=' SANS '` if it is not wished (cf [6.3.19]).

## 1.2.22 MODI\_MAILLAGE

### **MODI\_BASE new:**

- Allows to impose a change of reference mark (cf [6.3.18]).

### **TRANSLATION, ROTATION, SCALE new:**

- These keywords make it possible to operate translations, rotations and put at scale of a grid (cf [6.3.18]).

## 1.2.23 POST\_K1\_K2\_K3

### **FOND\_FISS new:**

- See `CALC_G_THETA_T`.

### **TOUT\_ORDRE, NUME\_ORDRE, LIST\_ORDRE new:**

- The setting in data is modified, the order itself will explore the structure of data result (cf [6.3.4]).

## 1.2.24 POST\_RCCM

### **OPTION=' FATIGUE\_B3200 ' new:**

- Analysis with the tiredness of a line of healthy piping according to code RCCM §B3200 (cf [6.3.19]).

### **OPTION=' FATIGUE\_B3600 ' new:**

- Analysis with the tiredness of a line of healthy piping according to code RCCM §B3600 (cf [6.3.16]).

## 1.2.25 PRE\_GMSH

### **MODI\_QUAD new:**

- Product of the quadratic meshes before converting the grid GMSH with the format ASTER (cf [6.3.7]).

## 1.2.26 PROJ\_MESU\_MODAL

### **Syntax was deeply altered and its wide possibilities.**

- See the documentation of the order and the CAS-tests `sdl104` and `sdlv122` (cf [6.3.18]).

## 2 Innovations between versions 6.2 and 6.3

### 2.1 Modifications common to several orders

#### **TAILLE\_BLOC removed:**

- Functionality taken again by BEGINNING and CONTINUATION, TAILLE\_BLOC is not available any more in the following orders:

AFFE_CHAR_ACOU	AFFE_CHAR_MECA	AFFE_CHAR_MECA_C
AFFE_CHAR_MECA_F	AFFE_CHAR_OPS011	AFFE_CHAR_THER
AFFE_CHAR_THER_F	AFFE_MODELE	CALC_CHAM_ELEM
CALC_ELEM	CALC_FORC_AJOU	CALC_MATR_AJOU
CALC_NO	DYNA_NON_LINE	MACR_ASCOUF_CALC
MACR_ASPIC_CALC	MACR_ELEM_STAT	MACRO_ELAS_MULT
MACRO_MATR_AJOU	MACRO_MATR_ASSE	MACRO_PROJ_BASE
MECA_STATIQUE	NUME_DDL	NUME_DLL_GENE
POST_ELEM	RECA_WEIBULL	STAT_NON_LINE
THER_LINEAIRE	THER_NON_LINE	THER_NON_LINE_MO

### 2.2 Reabsorbed order

**MACRO\_CHAR\_F\_U** is removed. The functionality is covered by piloting specific to the limiting analysis ANA\_LIM of STAT\_NON\_LINE (cf [6.2.17]).

### 2.3 Changes of convention

- **ANGL\_REP** under the keyword factor HULL in AFFE\_CARA\_ELEM : change of sign of the angle  $\beta$  (see AFFE\_CARA\_ELEM) (cf [6.2.14]),
- **NU\_LT** becomes **NU\_TL** and reciprocally (see DEFI\_MATERIAU) in ELAS\_ORTH,
- Coefficient  $\frac{1}{2}$  in the calculation of the thermal contribution of **ENER\_POT** (see CALC\_ELEM and POST\_ELEM, cf [6.2.13]).

### 2.4 Modified orders

#### 2.4.1 AFFE\_CARA\_ELEM

##### **AFFE\_SECT, AFFE\_FIBRE new:**

- To allow to describe the section of a multifibre element of beam starting from a grid 2D (keyword factor AFFE\_SECT) or directly by defining fibres in one (keyword AFFE\_FIBRE, cf [6.2.6]).

##### **HULL/ANGL\_REP modified:**

- Convention used here was contrary with those taken for the beams and the definition of the reference marks of orthotropy. The sign of the second angle defined by ANGL\_REP is thus reversed, it is the convention of the nautical angles (cf [6.2.14]).

**COQUE\_NCOU , GRILLE\_NCOU , TUYAU\_NSEC and TUYAU\_NCOU new:**

- Under the keywords factors HULL, GRID, and BEAM to describe the cutting of a hull/plate in layers, of a pipe in layers and angular sectors. They were previously indicated under STAT\_NON\_LINE (cf [6.2.6]).

**DIST\_N removed:**

- Replaced by OFFSETTING (cf [6.2.30]).

## 2.4.2 AFFE\_CHAR\_MECA

### HARLEQUIN/CARA\_ELEM new:

- To provide the characteristics of the hull in the case of a junction enters a model 3D and a model hull (cf [6.2.28]).

### GONE new:

- Allows to impose the incompressibility on the new incompressible elements (cf [6.2.17]).

## 2.4.3 AFFE\_MODELE

### AFFE/PHENOMENON and AFFE/MODELING new possibilities:

- Suppression of the phenomenon NON\_LOCAL, and addition in the phenomenon MECHANICS nonlocal laws of behavior regularized on the deformation, and of associated modelings: 3D\_GRAD\_EPSI, D\_PLAN\_GRAD\_EPSI, C\_PLAN\_GRAD\_EPSI, AXIS\_GRAD\_EPSI and of modelings associated with the formulation with gradients with internal variables 3D\_GRAD\_VARI, D\_PLAN\_GRAD\_VARI, C\_PLAN\_GRAD\_VARI, AXIS\_GRAD\_VARI (cf [6.2.20]).
- New modeling PLAN\_FISSURE associated with the finite elements of type CZM (joined) allowing to treat the propagation of crack with a law of behavior of the type Barenblatt (cf [6.2.26]).
- New modelings 3D\_INCO, D\_PLAN\_INCO (replaces PLAN\_INCO), C\_PLAN\_INCO associated with the formulation with three fields of the new incompressible element (displacement, pressure, swelling, cf [6.2.17]).
- New modelings lumpées in THM: 3D\_HHMD, 3D\_HMD, 3D\_THHD, 3D\_THHMD, 3D\_THMD, AXIS\_HHMD, AXIS\_HMD, AXIS\_THHD, AXIS\_THHMD, AXIS\_THMD, D\_PLAN\_HHMD, D\_PLAN\_HMD, D\_PLAN\_THHD, D\_PLAN\_THHMD, D\_PLAN\_THMD (points of integration brought back to the tops of the elements, cf [6.2.25]).
- New modelings POU\_D\_EM (right beam of Euler) and POU\_D\_TGM (right beam of Timoshenko with warping) associated with the multifibre beams (cf [6.2.6]).

### AFFE/MODELING change of name:

- Modeling PIPE is not accessible any more, it is replaced by TUYAU\_3M (cf [6.2.30]).

## 2.4.4 ASSISTANCE

### ORDER removed:

- This functionality is not available any more (did not function any more since version 6.0).

## 2.4.5 CALC\_ELEM

### EPOT\_ELEM\_DEPL modified:

- Homogenisation of the calculation of the potential energy (suppression of the  $\frac{1}{2}$  for the thermal contribution at the end of the deformation energy) and addition of the thermal term of dilation for the elements of structure (cf [6.2.22]).

**SENSITIVITY/ THETA removed:**

- SENSITIVITY is now a simple keyword which receives the list of the significant parameters, THETA is replaced by PARM\_THETA (cf [6.2.1]).

**PARM\_THETA new:**

- Point out the value of the parameter of theta method used to solve transitory thermal calculation, value by default: 0.57.

## **ERTH\_ELEM\_TEMP and ERTH\_ELNO\_ELEM new:**

- Options associated with the estimator with error in residue in thermics (cf [6.2.1]).

## **INFORMATION new:**

- Allows to obtain details on calculations carried out (in particular of sensitivity, cf [6.2.1]).

## **DLSI\_ELGA\_DEPL removed:**

- This option is removed. The calculation of the Lagrangian derivative from now on is activated by the operator of calculation (MECA\_STATIQUE, STAT\_NON\_LINE, THER\_LINEAIRE) when the keyword SENSITIVITY is activated.

## **2.4.6 CALC\_MATR\_ELEM**

### **MASS\_ID\_MDEP\_R, MASS\_ID\_MTEM\_R, MASS\_ID\_MDNS\_R, MASS\_ID\_MTNS\_R new:**

- Options allowing to calculate a matrix identity (displacements or temperatures, symmetrical or not-symmetrical) on finite elements in order to calculate the eigenvalues of a matrix of rigidity or other (cf [6.2.9]).

## **2.4.7 CALC\_NO**

### **SENSITIVITY new:**

- List of the significant parameters (cf [6.2.1]).

### **DLDE\_NOEU, DLSI\_NOEU\_DLDE, DLTE\_NOEU removed:**

- The calculation of these options is not available any more. The calculation of the Lagrangian derivative from now on is provided by the operator of calculation (MECA\_STATIQUE, STAT\_NON\_LINE, THER\_LINEAIRE) when the keyword SENSITIVITY is activated.

## **2.4.8 COMB\_SISM\_MODAL**

### **TYPE\_COMBI replacement:**

- This keyword replaces TYPE who was removed in version 6.4, possible values: QUAD, LINE, ABS (cf [6.2.26]).

## **2.4.9 CREA\_RESU**

### **OPERATION new:**

- Defines the operation to carry out among AFFE, ECLA\_PG, PERM\_CHAM, PROL\_RTZ (cf [6.2.12]).

### **NUME\_ORDRE\_INIT removed:**

### **PRECISION, CRITERION new:**

- The user does not provide any more a sequence number, the access is done directly starting from the value of the moment by possibly providing one PRECISION and one CRITERION (cf [6.2.21]).

## 2.4.10DEFI\_BASE\_MODAL

### DIAG\_MASS new:

- This option makes it possible to create a modal base containing the static modes and the dynamic modes, the static modes are such as the matrix of mass projected on this basis is diagonal (cf [6.2.11]).



## 2.4.11DEFI\_FONC\_ELEC

### **INST\_CC\_INIT obligatory:**

- This keyword is now obligatory (cf [6.2.14]).

## 2.4.12DEFI\_GROUP

### **CRIT\_NOEUD new:**

- Allows to define starting from a group of mesh, a group of nodes only made up of the nodes TOPS, of the nodes MEDIUMX, or of the nodes CENTER (cf [6.2.17]).

## 2.4.13DEFI\_MATERIAU

### **NU\_LT modified:**

- In ELAS\_ORTH, one takes the convention of Batoz, that is to say: NU\_LT/E\_L = NU\_TL/E\_T, as in DEFI\_COQU\_MULT (cf [6.2.13]).

### **ROUSS\_VISC new:**

- Model of Rousselier extended to viscoplasticity, parameters SIGM\_0, EPSI\_0 and M (cf [6.2.10]).

### **FLU\_IRRA new:**

- Modification of the law ASSE\_COMBU to take into account a dependence of creep compared to the fluence. Keywords: QSR\_K, BETA, PHI\_ZERO and L (cf [6.2.9] and [6.2.13]).

### **LABORD\_1D new:**

- New law of behavior 1D endommageable for the concrete (cf [6.2.6]).

### **MAZARS new:**

- New law of behavior endommageable for the concrete (cf [6.2.25]).

### **CAM\_CLAY new:**

- New law of elastoplastic behavior for the porous environments (grounds, porous joints, cf [6.2.25]).

### **LAIGLE new:**

- New law of behavior in rock mechanics (cf [6.2.25]).

### **RUPT\_FRAG modification:**

- New keywords SIGM\_C and SAUT\_C to treat the propagation of crack with the elements CZM (cf [6.2.26]).

### **NORTON\_HOFF removed:**

- The new incompressible finite elements offer the same functionality by using only the elastic limit (cf [6.2.17]).

## 2.4.14DYNA\_LINE\_HARM

**SENSITIVITY new:**

- List of the significant parameters (cf [6.2.1]).

## 2.4.15 DYNA\_NON\_LINE and STAT\_NON\_LINE

### **ENDO\_ISOT\_BETON new:**

- Replace the behaviors `BETON_ENDO_LOCAL` and `BETON_GRAD_EPSI` who are removed (cf [6.2.25]).

### **ENDO\_FRAGILE new:**

- Replace the behavior `ENDO_LOCAL` and `ENDO_GRAD_EPSI` (cf [6.2.25]).

### **PLAS\_GRAD\_LINE , PLAS\_GRAD\_TRAC removed:**

- The laws specific to the nonlocal behavior are removed, one uses in this case respectively `VMIS_ISOT_LINE` and `VMIS_ISOT_TRAC`. Associated with a modeling `*_GRAD_EPSI` or `*_GRAD_VARI` in `AFFE_MODELE` (cf [6.2.22]).

### **LABORD\_1D , MAZARS , BARENBLATT , ROUSS\_VISC , CAM\_CLAY , LAIGLE new:**

- New behaviors (see `DEFI_MATERIAU`).

### **SENSITIVITY new:**

- List of the significant parameters (cf [6.2.1]).

### **INCREMENT/OPTI\_LIST\_INST , NOM\_CHAM , NOM\_CMP , VALE new:**

- Under the keyword factor `INCREMENT`, these new keywords define the options of the automatic recutting of the step of time (cf [6.2.21]).

### **RHO replaced:**

- The coefficient of penalization of Lagrangian increased is henceforth provided under the keyword `R` (cf [6.2.22]).

### **MODELE\_NON\_LOCAL removed:**

- This keyword does not exist any more, the nonlocal behavior is activated directly starting from the choice of the elements in `AFFE_MODELE` (cf [6.2.22]).

### **TUYAU\_NCOU , TUYAU\_NSEC , COQUE\_NCOU removed:**

- These characteristics are henceforth indicated in `AFFE_CARA_ELEM` (cf [6.2.6]).

### **HYDR removed:**

- To use the behavior `HYDR`, it is necessary to overload the code in development mode with the routines `PERMEA` and `SATURATED` or to use `HYDR_UTIL` with the definition of the parameters materials in `DEFI_MATERIAU` (cf [6.2.19]).

## 2.4.16EXTR\_RESU

### **NOM\_CHAMP new:**

- To oppose to `CHAMP_EXCLU`, the user can select is the fields which it wishes to preserve, that is to say those that it wishes to exclude (cf [6.2.14]).

## 2.4.17IMPR\_COURBE

**EXCEL new:**

- To print one or more curves in columns (cf [6.2.4]).

## 2.4.18IMPR\_FICO\_HOMA

**NUMORD\_INDICA , NUMPT\_INDICA , NOM\_RESU\_INDICA , NOM\_CHAM\_INDICA new:**

- Information on the indicator of error: sequence number, not time and name of the field of the indicator in the structure of data result (cf [6.2.16] and [6.2.22]).

**NOM\_MED\_SUPPOR removed:**

- One uses from now on name MED of the grid as starter.

## 2.4.19IMPR\_MACR\_ELEM

**FORMAT 'PLEXUS' new:**

- Allows to print with format IDEAS version 5: matrices of mass and rigidity generalized per block, clean modes dynamic, static modes of the modal base (cf [6.2.11]).

## 2.4.20IMPR\_RESU

**FORMAT 'GMSH' new:**

- Impression for postprocessing with format GMSH (cf [6.2.17]).

## 2.4.21LIRE\_CHAMP

**NUME\_ORDRE , NUME\_PT , NOM\_MAIL\_MED new:**

- Information for the reading of a field to format MED (cf [6.2.16] and [6.2.22]).

## 2.4.22MACR\_ASCOUF\_CALC

**TRANSFORM new:**

- Allows to determine the local reference mark of postprocessing (cf [6.2.24]).

## 2.4.23MACR\_ASCOUF\_MAIL

**SYME new:**

- The allowed values are from now on: QUARTER, HALF, ENTIRETY (cf [6.2.24]).

**LENGTH new:**

- Parameter used in the case of axisymetry (cf [6.2.24]).

## 2.4.24MACR\_ASPIG\_CALC

**RCCM new:**

- Activate the post treatments according to the rules of dimensioning of the RCCM.

**COMP\_INCR new:**

- Keyword gathering factor RELATION and VMIS\_ISOT\_TRAC.

## 2.4.25MACRO\_MODE\_MECA

**COEF\_DIM\_ESPACE new:**

- See `MODE_ITER_SIMULT`.

## 2.4.26 MECA\_STATIQUE

### SENSITIVITY/ THETA removed:

- SENSITIVITY is now a simple keyword which receives the list of the significant parameters, THETA is removed (cf [6.2.1]).

## 2.4.27 MODE\_ITER\_SIMULT

### COEF\_DIM\_ESPACE new:

- Multiplicative coefficient which makes it possible to modulate the waveband for each under - space (cf [6.2.14]).

## 2.4.28 MODI\_MAILLAGE

### GROUP\_NO\_APPUI , GROUP\_NO\_STRU new:

- Groups of nodes of the support and the structure for the reactualization of the supports (cf [6.2.17]).

## 2.4.29 MODI\_OBSTACLE

### BORING new:

- To transmit a message of alarm during the boring of the tube (cf [6.2.13]).

## 2.4.30 NUME\_DDL

### MODEL , LOAD new:

- To obtain information on classification in order to appreciate the size of a model without doing the calculation (cf [6.2.14]).

## 2.4.31 POST\_ELEM

### ENER\_POT modified:

- See EPOT\_ELEM\_DEPL of CALC\_ELEM (cf [6.2.22]).

### TRAV\_EXT new:

- Keyword factor to calculate the work of the external efforts (cf [6.2.20]).

## 2.4.32 POST\_FATIGUE

### LOADING new:

- Keyword factor for better structuring the order (possible values: UNIAXIAL, PERIODIC, UNSPECIFIED, cf [6.2.13]).

## 2.4.33 POST\_K\_BETA

- **New order** for the analysis of harmfulness of defect by the K\_beta method; intended for the tool trade Secure-Epicure (cf [6.2.28]).

## 2.4.34 POST\_RCCM

### GRID , NODE , GROUP\_NO new:

- Allows to define a way starting from a group or of a list of nodes (cf [6.2.5]).

## 2.4.35 POST\_RELEVE\_T

**OPERATION= ' MOYENNE\_RCCM' removed:**

- From now on, this operation is carried out only by POST\_RCCM, should be provided working stress SM in DEFI\_MATERIAU (cf [6.2.25]).

**NOEUD\_CMP new:**

- New variable of access (cf [6.2.3]).

## 2.4.36 PROJ\_CHAMP

**TOUT\_CHAM, NOM\_CHAM new:**

- Choice of the fields to be projected (cf [6.2.25]).

## 2.4.37 PROJ\_MATR\_BASE

**NB\_VECT removed:**

- Information is provided in NUME\_DDL\_GENE (cf [6.2.20]).

## 2.4.38 PROJ\_MESU\_MODAL

**MEASUREMENT/MODEL new:**

- Name of the model of measurement (cf [6.2.11]).

## 2.4.39 PROJ\_VECT\_BASE

**NB\_VECT removed:**

- See PROJ\_MATR\_BASE.

## 2.4.40 RECU\_FONCTION

**SOUS\_POINT new:**

- To recover the value on a under-point (used for the multi-layer elements and the multifibre beams, cf [6.2.6]).

## 2.4.41 RECU\_TABLE

**NOM\_PARA new:**

- To recover the value of a parameter (cf [6.2.11]).

## 2.4.42 STAT\_NON\_LINE

See DYNA\_NON\_LINE .

## 2.4.43 TEST\_RESU

**SOUS\_POINT new:**

- Allows to specify the under-point on which one wants to test the value (cf [6.2.6]).

## 2.4.44 THER\_LINEAIRE

**SENS\_INIT new:**

- Defines the initial field of a transitory calculation from which the evolutionary calculation of the derivative of the temperature is carried out; replace DEUL\_INIT.



## 2.4.45THER\_NON\_LINEAIRE

### **SENSITIVITY new:**

- To provide the list of the significant parameters (cf [6.2.9]).