

Manuel d'Utilisation
U4.0- booklet: Use of the orders
Document: U4.01.03

Innovations and modifications of version 7

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* intervened between each version since version 7.0. Index A of this document thus mentions changes introduced since **version 7.3** from April 2004 and valid for **version 7.4** from December 2004.

For more precise details, one will consult the documentation of the orders and the file `histor` under - corresponding version (e.g.: [7.3.12], section *Development* site `www.code-aster.org`). The impacted orders are listed alphabetically.

1 Innovations between 7.3 and 7.4

1.1 Modifications of the environment

1.1.1 Med

`Code_Aster` be pressed now on library MED 2.2. For reading files with the format med 2.1.5, they should be converted with the tool `med_import` (there do not exist tools in the opposite direction).

1.1.2 Lobster

Following the change of version of med, `lobster` also evolved to support the same level of library. `lobster 7.1` also bring other innovations (cf [U7.03.xx]).

1.2 New orders

1.2.1 CREA_TABLE

This order makes it possible to create a table starting from a function or several lists of entreties, realities or character strings. One can create a full table or with holes by indicating the lines which one wishes to inform.

1.2.2 DEFI_COMPOR

This order makes it possible to define a single-crystal or polycrystalline behavior.

1.2.3 DEFI_PART_FETI

This order makes it possible to create a partitioning under-fields for a resolution by the Feti method.

1.2.4 IMPR_FONCTION

This new order replaces `IMPR_COURBE`, and it treats only the functions (from where the name change), the tables being treated by `IMPR_TABLE` (cf [7.3.13]).

1.2.5 MACR_ECLA_PG

This macro-order replace the options `ECLA_PG` of the two orders `CREA_MAILLAGE` and `CREA_RESU`. Coherence between the two orders is thus ensured.

1.2.6 MODI_MODELE_XFEM

This order makes it possible to create finite elements with `ddl nouveau riches` necessary to method XFEM.

1.3 Reabsorbed orders

1.3.1 DEFI_VALEUR

Contents of the Python objects being saved (in the file `pick.1`) “at side” of the base Aster (file `glob.1`), it is not necessary any more to have a specific order to define a parameter.

For example (see also [U3.01.0x]):

```
deuxpi = 2.*pi
```

1.3.2 IMPR_COURBE

Replaced by IMPR_FONCTION (cf [7.3.13]).

1.3.3 POST_GOUJ2E

This order had not been reabsorbed at the same time as the associated macros MACR_GOUJ2E_MAIL/CALC. The method for calculation is preserved in the CAS-tests zzzz120a and zzzz120b (cf [7.2.14]).

1.4 Modifications common to several orders

1.4.1 Keywords **FILE** and **UNIT**

According to the type of order, one was to use is **UNIT** (reading commands) where a logical number of unit was expected, that is to say **FILE** (orders of postprocessing) behind which one not expected a file name but a “label” (ddname) which was associated with a unit logical by default or affected via the order **DEFI_FICHER** (ex-DEFUFI).

The concept of label disappears; the orders function all with **UNIT** and, those which can use a true file name accept also the keyword **FILE**.

The risk of confusion is reduced: one provides to **UNIT** the logical unit well informed in **astk** and with **FILE** a file name complete Unix (see also the use of **REPE_IN/REPE_OUT** in the documentation of **astk** [U1.04.00]).

1.4.2 Orders of postprocessing **CALC_ELEM**, **CALC_NO**, **CALC_G_LOCAL_T**, **CALC_G_THETA_T**, **POST_ELEM**

MODEL, **CHAM_MATER**, **CARA_ELEM**, **EXCIT** become optional:

- The structure of data result (exit of **STAT_NON_LINE**, **THER_LINEAIRE**...) keep in memory these 4 parameters, it thus becomes optional to provide them to these operators of postprocessings. One can however inform these keywords in certain typical cases; it is checked whereas they are the same ones which was used for calculation, if it is not the case, one emits an alarm or one stops in error (case of **MODEL**) (cf [7.3.7], [7.3.24]).

1.5 Modified orders

1.5.1 **AFFE_CARA_ELEM**

ANGL_L, **POUR_CENT_L**, **POUR_CENT_T** removed, **SECTION_L** famous in **SECTION** :

- These keywords do not have any more interest since the introduction of new elements of grid membrane which make it possible to model the grids of reinforcement in a given direction, and which are usable jointly with a modeling 3D of the concrete. In the same way the elements roasts (usable with “hull” work from now on in only one direction. The orientation of the reinforcements is defined under **ANGL_REP** (cf [7.3.10]).

POUTRE/VARI_SECT modified:

- To guide the user among the possible choices, one chooses a value now for **SECTION**, then for **VARI_SECT** (new choice: **CONSTANT** by default) what makes it possible to limit the list of possible for **CARA** (cf [7.3.23]).

PREC_AIRE, **PREC_INERTIE** new:

- One checks the coherence of the information (surface and inertia of the multifibre beams) provided under the keywords **BEAM** and **AFFE_SECT** with the precision indicated by these keywords (cf [7.3.28]).

1.5.2 **AFFE_CHAR_MECA/AFFE_CHAR_MECA_F**

FORMULATION new:

- At the time of the resolution of a problem of contact with the method continues, one has the choice between a formulation in displacement (value DEPL) or of speed (value QUICKLY, well adapted numerically to the treatment of the shocks) (cf [7.3.18]).

TOLE_PROJ replaced by TOLE_PROJ_EXT, TOLE_PROJ_INT new:

- In the case of symmetrical pairing MAIT_ESCL_SYME, it is necessary to have a tolerance of projection for the detection of the worthless pivots (cf [7.3.23]).

ITER_MULT_MAXI new:

- ITER_MULT_MAXI multiplied by the number of nodes slaves gives the maximum number of iterations of contact (cf [7.3.23]).

COEF_MULT_2 , VECT_NORM_2 , DIST_1 , DIST_2 replaced by COEF_MULT_ESCL , VECT_NORM_ESCL , DIST_MAIT and DIST_ESCL :

- Homogenisation of the vocabulary following the renaming of GROUP_MA_1/2 in GROUP_MA_MAIT/ESCL (cf [7.3.24]).

GRAPPE_FLUIDE new keywords:

- Several keywords making it possible to locate the forces according to their type and their zone application were added (APPL_FORC_XXXX, DIRE_FORC_FPLAQ, UNITE_IMPR_XXXX) (cf [7.3.23]).

HARLEQUIN modifications:

- Improvement of the method Harlequin (cf reference document) and addition of the keywords COND_LIM, JOINING, POIDS_GROSSIER, POIDS_FIN (cf [7.3.28]).

1.5.3 AFFE_MATERIAU

SECH_REF new:

- Allows to inform the value of the drying of reference; with this concentration, the withdrawal of desiccation is null. The user must think of informing K_DESSIC if its field of drying is variable (cf [7.3.2]).

1.5.4 CALC_FATIGUE

MODEL removed:

- The keyword was not useful (cf [7.3.2]).

1.5.5 CALC_FONCTION

METHOD new:

- Improvement of the calculation of the FFT by adding the method PROL_ZERO in which one supplements the signal with zeros (cf [7.3.14]).

1.5.6 CALC_G_LOCAL_T and CALC_G_THETA_T

EXCIT replace LOAD :

- The multiplicative coefficient of the loads was not taken into account. It is now the case, LOAD, FONC_MULT and TYPE_CHARGE are added under EXCIT. Even modification in CALC_G_THETA_T (cf [7.3.6]). By default, it is not necessary besides to provide EXCIT, which is stored in the SD result (cf [§1.4.2]).

QUICKLY, ACCE new:

- Allow to take into account the terms of inertia in the calculation of G (cf [7.3.4]).

1.5.7 CREA_MALLAGE

NOM_CHAM new:

- To burst the elements (ECLA_PG), it is necessary to know the family of points of Gauss used. For that, one must provide the name of the field (cf [7.3.19]).

1.5.8 CREA_RESU

MODEL, CHAM_MATER, CARA_ELEM new:

- Allow to create a result of the type `elas_mult` (MACRO_ELAS_MULT) (cf [7.3.7]).

1.5.9 BEGINNING

FORMAT_HDF=' OUI ' / 'NOT' replace the keyword factor HDF :

- The bases with format HDF (portable binary format between machines of different architectures) are now supported by askt, it is thus enough to specify if one wants to read a base with this format or not (cf [7.3.8]).

VISU_EFICAS new:

- Allows to indicate (in the CAS-tests) if a command file is readable in Eficas or not (cf [7.3.5]).

1.5.10DEFI_FICHIER

FILE replace NOM_SYSTEME :

- In the idea of the simplification of the keywords UNIT and FILE (cf [7.3.14]).

Turn over a free logical unit (primarily for the macros) :

- In order not to cause conflict by choosing a logical unit already used, DEFI_FICHIER return a free number of unit (cf [7.3.23]).

1.5.11DEFI_MATERIAU

LEMA_SEUIL/_FO new:

- Introduction of a law of behavior derived from the law of Lemaître: below threshold the law is elastic, starting from the threshold, it behaves like a typical case of the law of Lemaître (cf [7.3.27]).

GRANGER_FP_INDT new:

- It is about a law of Granger at a constant temperature (cf [7.3.24]).

ENDO_ORTH_BETON new:

- Orthotropic law of behavior of the concrete with taking into account of the damage (cf [7.3.23]).

DRUCK_PRAGER/_FO new (old DRUCKER_PRAGER) :

- Addition of the possibility of calculating the sensitivity in 2D and 3D of the model of Drucker-Prager, the addition of _FO obliged has famous the model to avoid the conflicts of name (cf [7.3.21]).

VISC_SINH replace ROUSS_VISC :

- With the addition of the laws of viscoplastic behavior VISC_ISOT_TRAC and VISC_ISOT_LINE, the viscous model being that already used by ROUSS_VISC, the keyword was famous to be more general (cf [7.3.19]).

JOINT_BA new:

- New law of behavior of steel-concrete connection in 2D (cf [7.3.8]).

BARCELONA - ALPHAB new:

- If it is not provided, the parameter is calculated by the code (cf [7.3.6]).

ECOUC_VISCi, ECOUC_ISOTi, ECOUC_PLASi, ECOUC_CINEi new:

- Allow to define the parameters of the single-crystal behaviors (cf [7.3.1]).

1.5.12DEFI_MODELE_GENE

OPTION=' REDUIT' new:

- This option makes it possible to use the dynamic under-structuring by a method of modes of interface in order to reduce the size of the generalized modes, associated keywords: GROUP_MA_MAIT_1/2, MAILLE_MAIT_1/2 (cf [7.3.18]).

1.5.13 TO DESTROY

ALARM new:

- To use only in the macros-orders, this keyword makes it possible not to emit of alarm when one tries to remove a concept which does not exist (cf [7.3.27]).

CLASS new:

- Allows to remove an Aster object on the volatile basis (cf [7.3.8]).

1.5.14 DYNA_NON_LINE

TETA_METHODE new:

- Introduction of a formulation of speed for integration of the contact in dynamics. The value of θ (parameter of the diagram of integration in time) can be selected between 0.5 and 1. , this allows at the time of the resolution of a problem of contact with the method continues to vary dissipation during the phase of separation (cf [7.3.18], [7.3.22]).

REAC_ITER_ELAS new:

- Parameter to control the frequency of reactualization of the secant matrix (cf [7.3.21]).

1.5.15 DYNA_TRAN_EXPLI

It should be noted that this order will amalgamate with DYNA_NON_LINE in version 8.1.

REAC_ITER_ELAS new:

- Parameter to control the frequency of reactualization of the secant matrix (cf [7.3.21]).

1.5.16 END/CONTINUATION

FORMAT_HDF=' OUI ' / ' NOT ' replace the keyword factor HDF :

- The bases with format HDF (portable binary format between machines of different architectures) are now supported by askt, it is thus enough to specify if one wants to or not read/write a base with this format (cf [7.3.8]).

1.5.17 FORMULA

NOM_PARA, VALE new:

- The formulas are now unspecified expressions Python (it is enough that one can evaluate them all the same!). The names of parameters and the expression are defined under these two distinct keywords (cf [7.3.21] and [U4.31.05]).

1.5.18 IMPR_FICO_HOMA

UNITE_CONF, UNITE_DONN replace FICHIER_CONF, FICHIER_DONN :

- In the same spirit as in the paragraph [§1.4.1] (cf [7.3.23]).

MAJ_CHAM becomes a keyword factor...

- ... to offer more flexibility in the choice of the fields to be updated during an adaptation of grid (cf [7.3.20]).

1.5.19 IMPR_FONCTION

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The order was completely rewritten (cf [7.3.13]).

FORMAT modified:

- In a preoccupation with a homogenisation with the other orders, the format EXCEL becomes TABLE.
- Formats XMGRACE and AGRAF are dedicated to the tracers of the same name.
- Formats RESULT, ORDER and EARTHQUAKE are removed.

PILOT new (if FORMAT=' XMGRACE '):

- By default, one produces a file ready to be to visualize in `xmgrace`. One can also invite the various pilots available for `xmgrace` in order to produce a file ready to be introduced into a note of calculation like a file `POSTSCRIPT`, `PNG` or `JPEG`.

STYLE, COLOR, MARKER modified:

- These keywords make it possible to define the style of each curve, these are now entireties that it is necessary to provide.

FREQ_GRILLE_X/Y replace GRILLE_X/Y :

- Because `agraf` a frequency of squaring waits and `xmgrace` a step of grid.

FREQ_MARQUEUR is moved under the keyword factor CURVE .**UNIT, UNITE_DIGR modified:**

- `UNIT` the logical number of unit of the file contains in which one produces the curve (file `.dogr` with the format `AGRAF`). `UNITE_DIGR` allows to choose the logical unit associated with the file `.digr` with the format `AGRAF`.

TITLE replace TITRE_GRAPHIQUE, SOUS_TITRE replace COMMENT.**TABLE removed:**

- It is the role of the order `IMPR_TABLE`.

RECU_GENE removed:

- The order treats only the functions (or tablecloths). It is necessary to proceed in two times: to recover the values with `RECU_FONCTION`, then impression itself with `IMPR_FONCTION`.

1.5.20 IMPR_RESU

FILE, FORMAT moved:

- These keywords are moved out of keyword factor `RESU` so that one cannot use only one any more `IMPR_RESU` to write in two different files (because the files were often incomplete) (cf [7.3.14]).

1.5.21 IMPR_TABLE

The order was completely rewritten (cf [7.3.27], [7.3.29]).

FORMAT modified:

- In a preoccupation with a homogenisation with the other orders, the format `EXCEL` becomes `TABLE`, `TABLE` becomes `TABLEAU_CROISE` (a parameter function of 2 others).
- The format is added `XMGRACE` who produces a directly displayable file in `xmgrace`.
- Formats `ASTER` and `AGRAF` are unchanged (note: with the format `AGRAF`, the file `.digr` is not created).

- The format MOT_CLE is removed.

TOUT_PARA removed:

- It is enough to omit the keyword NOM_PARA to select all the parameters of the table.

SORTING modified:

- One can sort according to NR parameters, in the event of equality on a parameter, one passes to the following; ORDER is worth GROWING or DECREASING.
- CRITERION and PRECISION are removed.

PAGINATION modified:

- The number of parameter is unlimited.

TITLE replace **TITRE_TABLE**.

1.5.22 INFO_EXEC_ASTER

LISTE_INFO new possibility: **ETAT_UNITE**

- One can know if a file attached to a logical unit currently is opened or closed (cf [7.3.20]).

1.5.23 LIRE_FONCTION

The order was completely rewritten (cf [7.3.10], [7.3.21], [U4.32.02]).

INDIC_xxxx, **FORMAT**, **TYPE**, **SEPAR** new:

- Allow to build a real, complex function or a tablecloth starting from files whose format can slightly vary.

1.5.24 LIRE_RESU

NOM_CHAM removed:

- This keyword is useless out of specific blocks to each format (cf [7.3.28]).

1.5.25 MACR_ADAP_MAIL/MACR_INFO_MAIL

NON_SIMPLEXE modified:

- Treatment of the quadrangular elements (cf [7.3.20]).

1.5.26 MACR_FIAB_IMPR

PARA_SENSI new:

- Necessary to treat the case of the sensitivity (cf [7.3.24]).

1.5.27 MACRO_MISS_3D

VERSION new:

- Allows to specify the version of the Miss3D software used (cf [7.3.27]).

1.5.28 MECA_STATIQUE

METHODE=' FETI ' new:

- Introduction of a method of resolution by decomposition of fields of the Feti type. New keywords simple associates: **PARTITION**, **RENUM**, **RESI_RELA**, **NMAX_ITER**, **TYPE_REORTHO_DD**, **NB_REORTHO_DD**, **PRE_COND**, **SCALING**, **VERIF_SDFETI**, **TEST_CONTINU** (cf [7.3.3]).

INFO_FETI new:

- To modulate the amount of information to print at the time of a resolution by the method Feti (cf [7.3.27]).

1.5.29 `MODE_ITER_INV/MODE_ITER_SIMULT/NORM_MODE`

SENSITIVITY new:

- Possibility of doing calculations of sensitivities for the generalized and quadratic problems (cf [7.3.15]).

1.5.30MODI_MAILLAGE

ORIE_FISSURE replace ORIE_CONTACT :

- This functionality is used for the joined elements (cf [7.3.20]).

1.5.31POST_RCCM

TABL_SIGM_THER new:

- Allows to calculate s_n^* starting from the statement of the constraints under thermal loading only (cf [7.3.6]).

1.5.32STAT_NON_LINE

REAC_ITER_ELAS new:

- Parameter to control the frequency of reactualization of the secant matrix (cf [7.3.21]).

1.5.33TEST_FICHER

EXPR_IGNORE new:

- Allows not to preserve certain lines of the file tested by using regular expressions (cf [7.3.22]).

2 Innovations between 7.2 and 7.3

2.1 New orders

2.1.1 MACR_FIABILITE

This macro-order calculates the probability that a physical variable (displacement, forced,...) exceed a threshold defined by the user according to a certain number of parameters which will have been defined like sensitive by the user. These significant parameters can be Young, the Poisson's ratio modulus, a pressure, etc.

The macro-order calls on the software MEFISTO which is external with *Code_Aster*, and which implements the method FORMS. (cf [7.2.11]).

2.1.2 STANLEY

Stanley, tool for interactive postprocessing, was already present in version 7; this macro-order simplifies its call since one now launches it like an ordinary order. (cf [7.2.25]).

2.1.3 TEST_FICHER

This macro-order makes it possible to test to it not regression of the orders which produce files, for submission to the developers (cf [7.2.25]).

2.2 Reabsorbed orders

2.2.1 FACT_INTE_SPEC

This order was amalgamated with GENE_FONC_ALEA (cf [7.2.3]).

2.2.2 MACR_GOUJ2E_MAIL and MACR_GOUJ2E_CALC

These two macro-orders are reabsorbed. The method for calculation is preserved in the command files zzzz120a and zzzz120b who validated these features. (cf [7.2.14]).

2.3 Modified orders

2.3.1 AFFE_CARA_ELEM

RIGI_MISS_3D new:

- Allows to affect the terms of a matrix of impedance of ground calculated by MISS3D for a frequency of extraction given (cf [7.2.2]).

2.3.2 AFFE_MODELE

***_HH2D new modelings:**

- These modelings make it possible to take into account two phases in the two components; the dissolved air pressure is connected to the air pressure dryness by the law of Henry (cf [7.2.7]).

GRILLE_MEMBRANE new modeling:

- It is about a new element of tablecloths of reinforcement which works only out of membrane, not of ddl of rotation (cf [7.2.21]).

2.3.3 AFFE_CHAR_MECA/AFFE_CHAR_MECA_F

GRAPPE_FLUIDE new:

- Allows to take into account the fluid forces due with the displacement of the bunch in the fluid which bathes the internal elements of the heart. (cf [7.2.2]).

TOLE_PROJ new:

- Allows to adjust the projection of the nodes slaves towards the meshes Masters (cf [7.2.1]).

CONTACT famous keywords:

- GROUP_MA_MAIT, MAILLE_MAIT, GROUP_MA_ESCL, MAILLE_ESCL replace respectively GROUP_MA_1, MAILLE_1, GROUP_MA_2, MAILLE_2 (cf [7.2.4]).

2.3.4 ASSE_MALLAGE

OPERATION, MALLAGE_1, GRID new:

- Three types of operation are now available SOUS_STR, SUPERIMPOSE, JOINING (cf. [7.2.4]).

2.3.5 CALC_CHAM_ELEM/CALC_ELEM

Doubled bloom:

- These two orders made doubled bloom on most calculated options, only some options persist in CALC_CHAM_ELEM (cf [7.2.17]).

2.3.6 CALC_FATIGUE

TYPE_CHARGE new:

- The type of loading defines (periodic or not), under the keyword CRITERION, the choice is thus restricted according to the type of loading (cf [7.2.5]).

CRITERE=' DOMM_MAXI ', PROJECTION, DELTA_OSCI new:

- These keyword are associated with the new criterion adapted to the nonperiodic loadings; it is about a criterion with variable amplitude based on a critical level selected according to the induced maximum damage (cf [7.2.5]).

CRITERE=' DANG_VAN__MODI_AC ' / ' DANG_VAN_MODI_AV ' new:

- It is about a criterion with variable amplitude based on a critical level selected starting from the maximum damage. This criterion which is adapted if the loading is not periodical is an evolution of the criterion of original DANG VAN. 'AC' for constant amplitude, 'AV' for variable amplitude (cf [7.2.11]).

2.3.7 CALC_G_THETA_T

New type for the field θ :

- One can now provide a field θ of type `cham_no_depl_r` (and to build it made-to-order!) instead of that provided by `CALC_THETA` (cf [7.2.8]).

2.3.8 CALC_NO

GROUP_MA_RESU, GROUP_NO_RESU, MAILLE_RESU, NOEU_RESU new:

- Allow to specify the zone on which the field by element will be tiny room before calculating the values with the nodes because one could get incorrect results when a node is at the border of two modelings (cf [7.2.7]).

2.3.9 CREA_MALLAGE /CREA_RESU

ECLA_PG new possibilities:

- One can now burst a grid (by creating an element by point of Gauss) on a part only of one grid; and in 2D, to give a fictitious thickness to flattened elements.

Caution:

Parameters provided to CREA_MALLAGE and CREA_RESU must be coherent: same groups of meshes given in the same order (cf [7.2.25]).

2.3.10DEFI_FONCTION

NOM_PARA new values:

- Added names of parameter: NORM and DSP (cf [7.2.4]).

2.3.11DEFI_GROUP

CREA_GROUP_NO / TOUT=' OUI ' limited to the option TUNNEL :

- The use of TOUT=' OUI ' is not available for all the options, only for the option TUNNEL (cf [7.2.8]).

2.3.12DEFI_MATERIAU

BARCELONA new behavior for KIT_HHM and KIT_THM :

- Law of mechanical and hydrous behavior of the unsaturated grounds. This model utilizes two criteria, a mechanical criterion of plasticity which is that of CAM_CLAY and another hydrous criterion controlled by suction (cf [7.2.21]).

GLRC/GLRC_FO new behavior:

- Law of behavior of the reinforced concrete plates written in generalized efforts; associated finite element DKTG (on meshes TRIA3 and QUAD4) (cf [7.2.4]).

CORR_ACIER new:

- Elastoplastic model endommageable of a steel in which the plastic deformation with rupture depends on the rate of corrosion (cf [7.2.23]).

VISC_IRRA_LOG new behavior:

- Viscoelastic law of behaviour for the axial creep of the tubes guides under irradiation (cf [7.2.1]).

DRUCKER_PRAGER new behavior:

- Law of behavior for the soil mechanics (cf [7.2.7]).

LIQU_AD_GAZ_VAPE new:

- Mixing rate of the air dissolved for the THM (law of Henry) which connects the air pressure dissolved to the air pressure dryness (cf [7.2.7]).

DOMM_A, DOMM_B, COEF_CISA_TRAC new:

- Associated with the criterion of tiredness DOMM_MAXI of CALC_FATIGUE (cf [7.2.5]).

EPSP_SEUIL, EXP_S new:

- Associated with the criterion of tiredness DOMMA_LEMAITRE of CALC_FATIGUE (cf [7.2.19]).

LAMBDA and D_LAMBDA_TEMP removed under THM_*:

- Thermal conductivity is now defined like the product of three functions of the temperature (LAMB_T), saturation (LAMB_S) and of porosity (LAMB_PHI) more one constant (LAMB_CT), as well as the three derivative of the functions (D_LB_T, D_LB_S, D_LB_PHI) (cf [7.2.10]).

In the thermal case, only LAMB_T is obligatory, the other functions being then taken equal to one and their derivative worthless.

2.3.13 GENE_FONC_ALEA/GENE_MATR_ALEA/GENE_VARI_ALEA

- These orders were completely altered; FACT_GENE_ALEA was reabsorbed with the profit of GENE_FONC_ALEA. One will refer to documentations of the orders for the new syntax of use (cf [7.2.3]).

2.3.14 IMPR_RESU

FORMAT=' GMSH '/VERSION new defect:

- The version of the file GMSH by default is now 1.2 (in which GMSH can post-treat the quadrangles): the quadrangles are not cut out in triangles (cf [7.2.9]).

2.3.15 INCLUDE_MATERIAU

New materials available in the catalogue material:

- Z3CN20-09M, Z6NCTDV25-15 (cf [7.2.10], to see on the Intranet *Code_Aster* under Use/Materials).

2.3.16 MACR_RECAL

WEIGHT new:

- One can balance the various curves on which retiming (cf [7.2.4] is made).

2.3.17 MODI_MAILLAGE

SYMMETRY new:

- Allows to take the symmetrical one of a grid compared to a line or a plan according to dimension (cf [7.2.16]).

2.3.18 POST_ELEM

New:

- One can now use POST_ELEM after a multiple resolution with MACRO_ELAS_MULT (cf [7.2.22]).

2.3.19 POST_K1_K2_K3

ALL new:

- Allows to calculate the stress intensity factors on all the nodes of the meshes composing the bottom of crack (cf [7.2.4]).

2.3.20 PROJ_CHAMP

DISTANCE_MAX new:

- Allows to astutely project fields of a model A towards a model B. When nodes of the grid B are not in an element of grid A and that they are beyond a certain distance, the field is not project (cf [7.2.16]).

NUAG_DEG_* removed methods:

- These methods of projection of fields were removed, results vague (cf [7.2.22]).

2.3.21 POST_RCCM

TYPE_RESU_MECA new, modification of the options:

- This keyword can take the values 'UNIT' or 'PIPING', OPTION=' FATIGUE ' replace B3200 and B3600... (cf [7.2.17]).

2.3.22 MACRO_CARA_POUTRE

RT new result:

- One can obtain under this keyword of ray of torsion of the section of a beam (cf [7.2.2]).

2.3.23 STAT_NON_LINE/DYNA_NON_LINE

ALGO_1D new:

- One can thus use all the behaviors (small deformations) 3D in the elements of bar, grids, multifibre beams, one extended the method suggested by R. De Borst for the plane constraints to the behaviors 1D. That is translated, as for the plane constraints, by 4 internal variables (cf [7.2.18]).

ETAT_INIT obligatory in réentrant mode (when the result is enriched) (cf [7.2.1]).

BARCELONA new:

- Behavior of the grounds in medium unsaturated (cf [7.2.21]).

GLRC new:

- Behavior of the reinforced concrete plates written in generalized efforts (cf [7.2.4]).

CORR_ACIER, CORROSION new:

- Allow to provide the parameters necessary to the elastoplastic model endommageable of a steel in which the plastic deformation with rupture depends on the rate of corrosion (cf [7.2.23]).

SOUS_STRUC new:

- Integration of the static macronutrients. The application concerned is to optimize the resolution of the problems of important size in which only a restricted part with a nonlinear behavior (cf. [7.2.23]).

THER_HOMO, THER_POLY removed:

- Suppression of the thermal law of behavior under RELATION_KIT in THM (cf. [7.2.16]).

2.3.24 THER_NON_LINE_MO

The order is not any more réentrante because only one moment is calculated (stationary calculation in pointer).

3 Innovations between 7.0 and 7.2

One finds here the consecutive modifications of syntax to the evolutions introduced into versions 7.1 and 7.2 (version 7.0 being similar to the 6.4).

3.1 New orders

3.1.1 CALC_PRECONT

This order makes it possible to define and apply the prestressing of the cables of a structure out of reinforced concrete by taking into account various types of anchoring, and while making it possible to tighten individually each cable while respecting the standards of the BPEL (cf [7.0.14]).

3.1.2 CREA_TABLE

This order makes it possible to create a table starting from a function or of two lists (cf [7.1.17]).

3.1.3 DYNA_TRAN_EXPLI

It is the first grinding of the explicit operator of dynamics into which all the possibilities were not introduced yet (master-slave contact for example) (cf [7.1.16]).

3.1.4 EXTR_TABLE

This order makes it possible to recover the contents of a cell of a table; only the type MATR_ASSE_GENE_R is treated for the moment (cf [7.1.17]).

3.1.5 MACR_CABRI_MAIL - MACR_CABRI_CALC

These orders make it possible to net supports automatically, and of launching calculations on these grids (cf [7.1.5]).

3.2 Reabsorbed orders

Orders MACRO_CHAR_F_U and MACRO_MADMACS were removed in version 7.1.

3.3 Famous orders

- MACR_CARA_POUTRE replace MACRO_CARA_POUTRE.

- DEFI_FICHIER replace DEFUFI and TO CLOSE (these last will be reabsorbed in version 7.3). Moreover, DEFI_FICHIER gives access a file by indicating its name system (and not only with its number of logical unit FORTRAN) (cf [7.1.16]).

3.4 Modifications common to several orders

3.4.1 FOND_FISS replace BOTTOM, FOND_3D

In the orders CALC_G_LOCAL_T, CALC_G_THETA_T, CALC_THETA,
POST_K1_K2_K3

- Homogenisation of the vocabulary in breaking process (cf [7.0.9]).

3.4.2 Options of pre-packaging of the solver – keyword `PRE_COND`

In the orders `CALC_FORC_AJOU`, `CALC_MATR_AJOU`, `DYNA_NON_LINE`, `MACR_ASCOUF_CALC`, `MACR_ASPIC_CALC`, `MACRO_MATR_AJOU`, `MECA_STATIQUE`, `STAT_NON_LINE`, `THER_LINEAIRE`, `THER_NON_LINE`, `THER_NON_LINE_MO`

- The option `PRE_COND='DIAG'` is removed, only remains the option `LDLT_INC` (incomplete) (cf [7.0.14]).

3.5 Modified orders

3.5.1 `AFFE_CARA_ELEM`

`GROUP_MA_POI1` new:

- Keyword introduced to affect characteristics of `RIGI_PARASOL` on elements of the type `POI1` (cf [7.0.14]).

3.5.2 `AFFE_CHAR_MECA`

`DDL_POUTRE` new:

- Allows to impose boundary conditions in the local reference mark of a beam (cf [7.0.10]).

`CONNECTION` new:

- Under `DDL_IMPO`, to block all displacements at a stretch (cf [7.1.5]).

`SIGM_BPEL` value by default:

- The value by default is now `'NOT'`, the value `'YES'` is usually used only for the setting in prestressed cables (cf [7.0.13]).

3.5.3 `AFFE_CHAR_MECA_C`

`CONNECTION` new:

- Under `DDL_IMPO`, to block all displacements at a stretch (cf [7.1.5]).

3.5.4 `AFFE_CHAR_MECA_F`

`CONNECTION` new:

- Under `DDL_IMPO`, to block all displacements at a stretch (cf [7.1.5]).

`EFFET_FOND` new:

- The taking into account of the basic effect according to time (cf [7.0.1] allows).

3.5.5 `AFFE_MATERIAU`

`GROUP_NO`, `NODE` removed:

- The assignment is not possible that on meshes (cf [7.1.8]).

3.5.6 AFFE_MODELE

SHB8 new modeling:

- New element of hull under-integrated without mode of blocking (cf [7.1.18]).

AFFE modification:

- possibility of providing a list under AFFE, with rule of overload (cf [7.1.18]).

3.5.7 CALC_ELEM

EQUI_ELNO_SIGM different method of calculating:

Equivalent constraints (Von Mises, Tresca,...) were calculated starting from the constraints extrapolated with the nodes. One calculates from now on the equivalent constraints by extrapolation of the constraints equivalent calculated to the points of Gauss (as for the internal variables). The only stress fields provided are thus SIEF_ELGA_DEPL into linear and SIEF_ELGA into nonlinear.

On the other hand for the elements of hulls, the way of calculating of the equivalent constraints did not change: the user must calculate the stress field in a point thickness (SIGM_ELNO_DEPL into linear and SIGM_ELNO_COQU into nonlinear), and the option EQUI_ELNO_SIGM calculate the invariant of this field to the nodes.

3.5.8 CALC_FATIGUE

CRITERION new possibility:

- Addition of the criterion of DANG_VAN (cf [7.0.7]).

MODEL, GRID, GROUP_MA, MESH, GROUP_NO, NODE new:

- Allow post-to treat with the nodes on part of the grid by using the method of plan critical (cf [7.1.7]).

3.5.9 CALC_FONC_INTERP

VALE_PARA replace VALE_R ;

NOM_PARA, NOM_PARA_FONC, VALE_PARA_FONC, LIST_PARA_FONC, INTERPOL_FONC, PROL_GAUCHE_FONC, PROL_DROITE_FONC new:

- Possibility of creating a tablecloth starting from a formula with two parameters (cf [7.0.14]).
- The order is not any more réentrante: it treats a function and produces a function or a tablecloth.

3.5.10 CALC_FONCTION

ABS new:

- Calculation the absolute value of a function (cf [7.0.14]).

OPPOSITE new:

- Calculation the reverse of a function (cf [7.0.14]).

ECART_TYPE new:

- Calculation of the standard deviation of a function (cf [7.0.15]).

3.5.11 CALC_G_THETA_T

CALC_DG removed option:

- The calculation of the derivative of G follows the standard formalism now (keyword SENSITIVITY) (cf [7.1.12]).

3.5.12 COMB_SISM_MODAL

TYPE_COMBI replace TYPE :

- Under the keywords factors COMB_MULT_APPUI and COMB_DEPL_APPUI. The possible choices are 'QUAD' and 'LINE', 'ABS' was removed (cf [7.0.14]).

3.5.13 CREA_CHAMP

OPTION new:

- Allows to initialize a field as if it had been created by such option (cf [7.0.15]).

3.5.14 CREA_MALLAGE

COQU_VOLU new:

- Create a voluminal grid starting from a surface grid and a thickness (cf [7.1.11]).

LINE_QUAD new:

- Create a quadratic grid starting from a grid made up of linear elements (cf [7.0.5]).

QUAD_TRIA3 new:

- Create triangular meshes with three nodes starting from quadrangles (cf [7.1.9]).

3.5.15 BEGINNING / CONTINUATION

HDF new:

- To define the parameters for the reading of a base in format HDF (portable between machines) (cf [7.1.16]).

3.5.16 DEFI_CABL_BP

CONE new:

- Allows to define a cone which will support the tension loads of the cable (cf [7.0.16]).

Note:

| *It is now about an macro-order.*

3.5.17 DEFI_GROUP

APPUI_LACHE new:

- The group of the meshes being based on a node or a group of nodes defines (releases: “containing at least a node of the group”) (cf [7.1.10]).

TUNNEL new:

- The group of the nodes contained in a tunnel defines describes by its axis and its ray (cf [7.0.16]).

ALARM new:

- Allows to disable the release of the alarms emitted normally by the order.

Caution:

| *Must be used only by macro-orders which make sure in addition of the validity of the groups obtained.*

3.5.18 DEFI_MATERIAU

BETON_ECRO_LINE new:

- Taking into account of containment for the model ENDO_ISOT_BETON, one adds like parameter material SYC maximum constraint in simple compression (cf [7.0.17]).

BETON_UMLV_FP new:

- Addition of a relation of behavior for the taking into account of the clean creep of the concrete (cf [7.0.4]).

BPEL_ACIER / SY becomes F_PRG :

- F_PRG is the guaranteed constraint of the maximum loading with rupture (cf [7.1.17]).

COMP_THM new:

- Regrouping of the parameters required for a calculation THM according to the mixing rate used (cf [7.1.18]).

DIS_CONTACT / ANGLE_i and MOMENT_i :

- For the connection grid-pencil, one introduces the angles and moments function of the temperature and the fluence (cf [7.1.7]).

In fatigue:

- Addition of CRITERION of DANG_VAN (cf [7.0.7]).
- For the criterion MATAKE, ENDU_FT is replaced by COEF_FLEX_TORS.

3.5.19 TO DESTROY

OBJECT new:

- Possibility of destroying objects associated with concepts inaccessible to the user (cf [7.1.9]).

3.5.20 DYNA_LINE_TRAN and DYNA_NON_LINE

SENSITIVITY new:

- Addition of the calculation of the derivative of the fields results compared to the data material or boundary conditions (cf [7.1.5] for DYNA_LINE_TRAN, [7.1.3] for DYNA_NON_LINE).

3.5.21 END

HDF new:

- To define the parameters for the writing of a base in format HDF (portable between machines) (cf [7.1.16]).

3.5.22 FORMULA

ENTIRETY removed:

- The whole formulas are henceforth prohibited (cf [7.0.17]).

3.5.23 IMPR_FICO_HOMA

There are changes of syntax in this procedure, called by MACR_ADAP_MAIL, which is thus not described here.

3.5.24 IMPR_RESU

VERSION new:

- Allows to specify the level of version of the files to format GMSH. With version 1.2 (available in the recent versions of GMSH), the quadrangles are not cut out any more in triangle, GMSH knowing to treat all the linear elements (cf [7.0.3]).

3.5.25IMPR_TABLE

TITRE_TABLE new:

- Possibility of defining a title during the impression of a table (cf [7.0.16]).

3.5.26INCLUDE_MATERIAU

UNITE_LONGUEUR new:

- Allows to use the data of the catalogue material with the millimetre like unit of length (cf [7.0.14]).

3.5.27 LIRE_CHAMP

INST new:

- One can now locate it (S) field (S) with reading with the moment in a file with format MED (cf [7.1.10]).

3.5.28 LIRE_RESU

FORMAT replace FORMAT_IDEAS :

- One specifies behind this keyword the format of reading: IDEAS or IDEAS_DS58 (cf [7.0.13]).

3.5.29 MACR_ADAP_MAIL

NON_SIMPLEXE new:

- Acceptance of the quadrangular, hexahedral, pentaedric elements allows (which are not refined) in a grid subjected to Lobster (cf [7.1.10]).

MAILLAGE_FRONTIERE new:

- Possibility of providing a grid for the follow-up of border (cf [7.1.10]).

TYPE_CHAM modification:

- One now expects the same thing as in the order CREA_CHAMP (cf [7.0.12]).

3.5.30 MACR_INFO_MAIL

NON_SIMPLEXE and MAILLAGE_FRONTIERE new:

- See MACR_ADAP_MAIL.

3.5.31 MECA_STATIQUE

INST_FIN new:

- The operator is now réentrant to be able to treat long transients (cf [7.1.8]).

3.5.32 MODE_ITER_SIMULT

APPROACH new possibility:

- Addition of the approach 'COMPLEX' to deal with the quadratic problem with the eigenvalues, for the strongly deadened cases for example (cf [7.0.12]).

3.5.33 MODI_MAILLAGE

ORIE_SHB8 new:

- Allows to direct the elements of hull SHB8 (cf [7.1.18]).

3.5.34 MODI_OBSTACLE

TUBE_NEUF removed:

- The keyword was moved in the order POST_USURE (cf [7.0.2]).

3.5.35MODI_REPERE

GROUP_MA, MESH, GROUP_NO, NODE new:

- Allows to restrict the change of reference mark to part of the grid (cf [7.0.9]).

3.5.36 PROJ_CHAMP

SENSITIVITY new:

- Allows to project fields derived from a grid on another (cf [7.1.10]).

3.5.37 POST_USURE

TUBE_NEUF new:

- Allows to provide new values of wear (cf [7.0.2]).

3.5.38 POST_RCCM

TYPE_KE new

- Offer two methods of calculating of That.

3.5.39 PRE_GMSH

MODI_QUAD removed:

- This functionality is taken again in CREA_MAILLAGE and applies to a grid *Aster* some is its origin (cf [7.0.6]).

Note:

| *PRE_GMSH is again a procedure.*

3.5.40 PRE_IDEAS

CREA_GROUP_COUL new:

- Allows to create or not the groups associated with the colors with IDEAS (cf [7.0.2]).

3.5.41 STAT_NON_LINE

RESI_REFE_RELA, SIGM_REFE, EPSI_REFE, FLUX_THER_REFE, FLUX_HYD1_REFE, FLUX_HYD2_REFE new:

- New method for the test of convergence compared to a value of reference defined for each size (cf [7.0.16]).

SELECTION new:

- Choice of parameter of piloting: NORM_INCR_DEPL, ANGL_INCR_DEPL, RESIDUE : one minimizes respectively the increment of displacement (defect), the angle between U^+ and U^- , the residue (cf [7.0.9]).

ETA_PILO_R_MAX, ETA_PILO_R_MIN, PROJ_BORNES new:

- Allow to define the terminals of the interval of research (cf [7.0.9]).

PAS_MIN_CRIT, ITER_LINE_CRIT, RHO_MAX, RHO_MIN, RHO_EXCL new:

- Terminals of linear research in the event of piloting (cf [7.0.9]).

CRIT_FLAMB new:

- Research of the modes of buckling of a structure (cf [7.1.17]).

SENSITIVITY new:

- Introduction of calculations of sensitivity into nonlinear (cf [7.1.3]).

3.5.42 TEST_TABLE

SENSITIVITY new:

- The test of the derived tables allows (cf [7.1.12]).

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