Procedure TEST_FONCTION

1. Goal

To extract a digital value or an attribute from a function for comparison with a value of reference. The function is a structure of data of the type `function` or `tablecloth`.

This procedure writes a conventional message then “OK” (if it is good) or “NOOK” (if not).

It does not stop the execution if the test is not checked; this makes it possible systematically to use it either for the tests of validation, or to extract and print a value of a function or a tablecloth for a particular value of a parameter.

This order is used primarily by the cases tests to validate the not-regression of the results.
2 Syntax

```plaintext
TEST_FONCTION

  ◆ / VALUE = _F (◆ FUNCTION = F, / [function]
  ◆ NOM_PARA = lnom, / [l_Kn]
  ◆ VALE_PARA   = will lpara, / [l_R]

  # Definition of the value of reference:
  # to see TEST_RESU [u4.92.01]

  / ATTRIBUTE = _F (◆ FUNCTION = F, / [function]
  ◆ PARA = reality, / [R]
  ◆ | PREC_PARA = / prec, / [R]
  ◆ | CRIT_PARA = / ‘RELATIVE’, / [DEFECT]
  ◆ | ‘ABSOLUTE’,
  ◆ ATTR = / ‘NOM_PARA’,
  ◆ | ‘NOM_RESU’,
  ◆ | ‘PROL_DROITE’,
  ◆ | ‘PROL_GAUCHE’,
  ◆ | ‘Interpol’,
  ◆ | ‘PROL_GAUCHE_FONC’,
  ◆ | ‘PROL_DROITE_FONC’,
  ◆ | ‘INTERPOL_FONC’,
  ◆ | ‘NOM_PARA_FONC’,
  ◆ ATTR_REFE = attr, / [KN]
  ◆ LEGEND = legend, / [KN]
  ◆ REFERENCE = / ‘ANALYTICAL’,
  ◆ | ‘SOURCE_EXTERN’,
  ◆ | ‘AUTRE_ASTER’,
  ),

  )
```

The functions are is with actual values [function], that is to say with complex values [fonction_C].
3 Operands

3.1 Keyword VALUE

♦ VALUE =
Keyword factor to test a value of a function or a tablecloth.

3.1.1 Operand FUNCTION

♦ FUNCTION = F
Name of the function (with a parameter) or tablecloth (with two parameters) on which is carried out the operation.

3.1.2 Operand NOM_PARA

◊ NOM_PARA = lnom
In the case of a function, this keyword is not treated.
In the case of a tablecloth, the user will give 2 names of parameter: the first defining the parameter of the tablecloth, the second defining the parameter of the function which one wants to test (see the order DEFI_NAPPE [U4.31.03]).

3.1.3 Operand VALE_PARA

♦ VALE_PARA = will lpara
In the case of a function, the user gives the value of the parameter for which the value of the function is tested.
In the case of a tablecloth, the user gives the 2 values corresponding to the names of the two parameters (that of the tablecloth and that of the function).

3.1.4 Keywords common to the orders TEST_XXX

The definition of the values of nonregression and reference, as well as acceptable tolerances, the comparison criterion is detailed in the documentation [u4.92.01] of the order TEST_RESU.

Specificities of TEST_FONCTION are:
• pas de whole values or character strings,
• pas de tolerance on the value of the parameter (TOLE_MACHINE and CRITERION takes only one value).

3.2 Keyword ATTRIBUTE

/ ATTRIBUTE =
Keyword factor to test an attribute of a function or a tablecloth.

3.2.1 Operand FUNCTION

♦ FUNCTION = F
Name of the function or the tablecloth on which the operation is carried out.

3.2.2 Operand PARA

◊ PARA = real
In the case of a function, this keyword is not necessary.
In the case of a tablecloth, the user gives the value of the parameter to recover the function in order to test the attribute.

### 3.2.3 Operands PREC_PARA / CRIT_PARA

◊ **PREC_PARA = prec**

One searches the function defined by the value of the parameter in an interval defined by the absolute or relative position:

```
"\text{inst} \pm \text{prec}"
```
(confer CRITERION [§3.2.3]).

By default, \text{prec} = 1.0D-3.

◊ **CRIT_PARA**

- `'RELATIVE'`: the interval of research is: [\text{inst} (1-\text{prec}), \text{inst} (1+\text{prec})]
- `'ABSOLUTE'`: the interval of research is: [\text{inst}-\text{prec}, \text{inst}+\text{prec}]

### 3.2.4 Operand ATTR

♦ **ATTR**

Name of the attribute to be tested. For the significance of the attributes to refer to DEFIFONCTION [U4.31.02] or with DEFINAPPE [U4.31.03].

### 3.2.5 Operand ATTR_REFE

♦ **ATTR_REFE = attr**

Attribute of reference. For the significance of the attributes to refer to DEFIFONCTION [U4.31.02] or with DEFINAPPE [U4.31.03].

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### 4 Examples

#### 4.1 Checking of a tablecloth

```
df1 = DEFI_FONCTION( NOM_PARA = 'INST', NOM_RESU = 'DEPL', 
                     VALE = (0., 0., 1., 1., 2., 2., 3., 3., 4., 4.))
df2 = DEFI_FONCTION( NOM_PARA = 'INST', NOM_RESU = 'DEPL', 
                     VALE = (3., 3., 4., 4., 5., 5.))
dn1 = DEFI_NAPPE( NOM_PARA = 'AMOR', NOM_RESU = 'DEPL', 
                 VALE = (0.01, 0.02), 
                 FUNCTION = (df1, df2))
```

```python
TEST_FONCTION(
    # the attribute is checked 'NOM_PARA' function df1 in the tablecloth dn1
    ATTRIBUTE = (_F (FUNCTION = dn1, 
                    PARA = 0.01, # 0.01 reached df1 
                    ATTR = 'NOM_PARA_FONC', 
                    ATTR_REFE = 'INST'),)
    # the attribute is checked 'NOM_PARA' tablecloth dn1
    _F (FUNCTION = dn1, 
         ATTR = 'NOM_PARA', 
         ATTR_REFE = 'AMOR'),
    # a value of the tablecloth is checked dn1 (in practice on the function df1)
    VALUE = _F (FUNCTION = dn1, 
                 NOM_PARA = ('AMOR', 'INST'), 
                 VALE_PARA = (0.01, 1.), 
                 VALE_REFE = 1.))
```

#### 4.2 Checking of a function

```
li1 = DEFI_LISTE_REEL ( DEBUT=0., 
                        INTERVALLE=_F (JUSQU_A=2*pi, PAS=2*pi/20), )

f1 = FORMULE ( NOM_PARA=' INST', 
               VALE=' sin (INST) + cos (INST) ','
               fonc=CALC_FONC_INTERP ( FONCTION=f1, 
                                      LIST_PARA=li1, 
                                      NOM_RESU=' DEPL', 
                                      INTERPOL=' LIN',)
```

```python
TEST_FONCTION(
    # an attribute of the function is tested
    ATTRIBUT=_F (FONCTION=fonc, 
                  ATTR=' INTERPOL', 
                  ATTR_REFE=' LIN LIN '),
    # a value of the function is tested
    VALEUR=_F (FONCTION=fonc, 
                VALE_PARA=pi, 
                REFERENCE=' ANALYTIQUE', 
                VALE_CALC=-1., 
                VALE_REFE=sin (pi) +cos (pi), ), )
```