

# SORT - Control of Sort Program

This Natural profile parameter is used to control the sort program used for the processing of SORT statements. It corresponds to the NTSORT macro in the Natural parameter module NATPARM.

SORT or NTSORT can be used to specify various options that control the handling of the sort program used when a SORT statement is executed.

The sort program to be used can be either Natural's internal one (the default for all environments) or an external one. The type of sort to be used depends on the setting of the keyword subparameter EXT.

<b>Possible settings</b>		For an explanation of the individual options and their possible settings, see <i>SORT Parameter Syntax</i> below.
<b>Default setting</b>		WRKSIZE=10 , STORAGE=MAIN , EXT=OFF , EXTNAME=SORT , EXTEOJ=OFF
<b>Dynamic specification</b>	yes	This parameter can only be specified dynamically. In the Natural parameter module NATPARM, the macro NTSORT must be used instead.
<b>Specification within session</b>	no	

The following topics are covered below:

- SORT Parameter Syntax
- NTSORT Macro Syntax
- Keyword Subparameters

## SORT Parameter Syntax

The SORT parameter is specified as follows:

```
SORT=(WRKSIZE=nnn,STORAGE=medium,EXT=ON/OFF,EXTNAME=name,EXTOPT=(options,...),EXTEOJ=ON/OFF)
```

## NTSORT Macro Syntax

The NTSORT macro is specified as follows:

```
NTSORT
WRKSIZE=nnn,STORAGE=medium,EXT=ON/OFF,EXTNAME=name,EXTOPT=(options,...),EXTEOJ=ON/OFF
```

The individual keyword subparameters are explained below.

## Keyword Subparameters

The following keyword subparameters are available:

WRKSIZE | STORAGE | EXT | EXTNAME | EXTOPT | EXTEOJ

### WRKSIZE - Size of Work Buffer Used by Sort Program

WRKSIZE specifies the size *nnnnnnn* (in KB) of the work buffer used by the sort program.

<b>Possible values:</b>	10 to 2097151, or 0.
<b>Default value:</b>	10

If you specify WRKSIZE=0, no sort operations can be performed.

The work buffer specified by WRKSIZE accommodates internal sort control data. The remaining storage is used to collect and sort the records. The size of the sort control data depends on various factors (the WRKSIZE itself, the sort record length, the number of sort keys, their size and format) and can therefore not be calculated in a formal way.

### STORAGE - Type of Storage Medium

STORAGE specifies the type of storage *medium* to be used by Natural's internal sort program.

In general, the SORT statement first tries to use the remaining storage in WRKSIZE. If the number of records does exceed this storage, the SORT statement tries to use intermediate storage to additionally process records:

MAIN	Only the remaining storage of WRKSIZE is used, no other intermediate storage is available. This is the default setting.
BP	The SORT buffer pool is used as intermediate storage. See note below.
SD	SD files are used as intermediate storage. This value is honored under Com-plete only.
SMARTS	SMARTS portable file system is used.

### Notes Concerning SD Files under Com-plete/SMARTS

- The files are allocated as temporary SD files. They are allocated for a stack level. This means, the name syntax of the SORT SD files is `&&STsnnn` with:

<code>&amp;&amp;</code>	Indicator for a temporary SD file
<code>ST</code>	Standard prefix for the SD sort file
<code>s</code>	Stack level
<code>nnn</code>	Sequence number within a single SORT run

- SMARTS work files are located in the SMARTS Portable File System. The path must be specified with the SMARTS environment variable \$NAT\_WORK\_ROOT. A special directory named SORT for SORT workfiles is added and for each user, a different directory is created named by the user ID. The resulting directory is then \$NAT\_WORK\_ROOT/sort/userid. The naming of the SORT work files corresponds to the SD files under Com-plete.

### Note Concerning Usage of Sort Buffer Pool

If you want to use a sort buffer pool, define the SORT keyword subparameter STORAGE=BP to indicate that a sort buffer pool is to be used for any additional storage beyond the defined WRKSIZE.

Simultaneously, use the profile parameter BPI or the parameter macro NTBPI to make a buffer pool of TYPE=Sort and NAME=*name* known to Natural, for example: BPI=(TYPE=Sort, NAME=XYZ).

When a name is specified with the BPI keyword subparameter NAME, reference is made to a global sort buffer pool, whereas a local sort buffer pool can be specified by NAME=' ' (blank).

### EXT - Use of External Sort Program

EXT specifies if an external sort program is to be used or not:

ON	An external sort program will be used. The use of an external sort program is possible only in batch environments, including IMS/BMP, TSO, TIAM and CMS.
OFF	The Natural SORT program will be used (this is the default).

### EXTNAME - Name of External Sort Program

This subparameter does not apply under BS2000/OSD.

EXTNAME specifies the *name* (1 to 8 characters) of the external sort program to be used. The default name is SORT.

### EXTOPT - Additional Options for External Sort Program

This subparameter does not apply under BS2000/OSD.

EXTOPT specifies additional *options* for the external sort program.

Natural generates the necessary field and format parameters and passes them to the external sort program. With EXTOPT, you can specify additional parameters to be passed to the external sort program. You can only specify parameters that are part of the control statement syntax of your external sort program.

You can specify up to two option strings which are delimited by a slash (/). The first option string is appended to the SORT control statement, the second option string is used to build an OPTION control statement. You may omit the option string before or after the slash. If the option string after the slash is omitted no OPTION control statement is generated at all.

The whole option string must be enclosed in single quotes ('...'). For compatibility reasons, it is still possible to have the option string enclosed in brackets instead.

For compatibility reasons, a single option string without a leading or trailing slash is handled differently. Depending on the underlying operating system, the options are appended to the following control statements:

z/OS and VM/CMS:	SORT control statement
z/VSE:	OPTION control statement

### EXTOPT Example:

The additional parameters can be specified as in the following example:

```
EXTOPT=(SIZE=E2000000,NOEQUALS,DYNALLOC=(3350,8))
EXTOPT='SIZE=E2000000,NOEQUALS,DYNALLOC=(3350,8)'
EXTOPT='SIZE=E2000000,NOEQUALS,DYNALLOC=(3350,8)/NOCHECK'
EXTOPT='/NOCHECK'
EXTOPT='WORK=4/'
```

### EXTEOJ - Action in the Event of an Error

EXTEOJ specifies the action to be taken if an error is detected during the execution of the external sort program:

ON	If an error is detected, SORT processing is terminated. ON requires that the SORT program used is able to detect a return code of 16 from both the E15 and E35 SORT exit routines.
OFF	If an error is detected, Natural withholds further calls to the sort program and ignores each record as it is passed to the E35 SORT exit routine (this is the default).