**Test Specification for validation tests of cell**

Project-ID: -

Sample phase: -

Supplier: -

Version:-

**Daimler Truck AG**

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Release and Version history

Table 1: Version history

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Version** | **Date** | **Change** | **Sections**  **/Test-ID** | **Author** | **Released** |
| 1.0 | 24.06.2024 | Creation of document. Document is based on former DT 666 002 by David Degler (26.03.2024) | All | C. Subramanian; T. Herdt |  |
| 1.1 | 31.07.2024 | Addition of rest time in Table 3 and CC phase in Table 5 | 4.3.1 | C. Subramanian; T. Herdt |  |

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# Aim of the document

The aim of this test specification is to do a series of different validation tests to validate the electrical cell model. This is done in order to clarify the precision of the model and identify modeling limitations.

# List of abbreviations

BOT Begin of Test

CNOM Nominal Cell Capacity

CRPT Cell Capacity of the latest RPT Procedure Test Cycle

Cx,y,CH Charge Capacity during RPT Procedure at Current x and Temperature y

Cx,y,DCH Discharge Capacity during RPT Procedure at Current x and Temperature y

CC Constant Current

CCCV Constant Current – Constant Voltage

CH Charge

CV Constant Voltage

DCH Discharge

Ex,y,CH Charge Energy during RPT Procedure at Current x and Temperature y

Ex,y,DCH Discharge Energy during RPT Procedure at Current x and Temperature y

EOL End of Life

EOT End of Test

ETP Cumulated Energy Throughput of whole Test

INOM Nominal Current (see section 4.2)

IRPT Current based on RPT capacity (see section 4.2)

n Number of CCCV Cycle Repetitions between RPT Procedures

OCV Open Circuit Voltage

Ri Internal Resistance as measured during RPT Procedure

RPT Reference Parameter Test, see DTC-O-5

SOC State of Charge (referenced to lates RPT capacity CRPT)

SOCstorage Defined SOC Condition for Cell Storage

SOHRPT State of Health (Current CRPT referenced to initial CRPT)

Tchamber Temperature of the Climate Chamber

Vdyn,min Minimum Allowed Voltage according to Operating Window (Under Load)

Vdyn,max Maximum Allowed Voltage according to Operating Window (Under Load)

η Efficiency

xcharge Multiplier for Applied Charging Current (“C-rate”)

xdischarge Multiplier for Applied Discharging Current (“C-rate”)

SOCset Supporting points of SOC to be tested

# List of references

[DTC-O-1] Testing Quality

[DTC-O-2] Measurement Data Specification

[DTC-O-3] Template for test reports

[DTC-O-4] Operating window cell

[DTC-O-5] RPTs for life and environmental tests

[DTC-O-6] Cell jig handling manual

[DTC-O-7] Data tables for test reports

# Test Description

This test is done in order to clarify the precision of the model and identify modeling limitations. The following tests are conducted, thermal relaxation, continuous currents (full DoD), continuous currents (partial DoD) and charge neutral pulses.

## Test equipment and setup

* Climate chamber: -20 ° C to 55 °C
* DC-converter: 3 C

Jigs and compression forces shall be applied as specified in component requirement specification or in cell specific handling manual according to DTC-O-6.

The test setup and all equipment shall be chosen based on the requirements. Additionally, the special requirements from DTC-O-1 concerning testing quality measures and allowable testing tolerance shall be met.

## General Definitions for Internal resistance/maximal power

1. CNOM = xx Ah

Explanation: CNOM is the specified nominal cell capacity. It does not change throughout test duration.

1. CRPT = CRPT,X after cycle X

Explanation: CRPT is the reference CCCV discharge capacity of the latest RPT process. Therefore, CRPT is regularly updated throughout the test duration, whenever an RPT process is conducted.

1. Cx,y,DCH

Explanation: Cx,y,DCH is the discharge capacity of the CC process (without CV phase) at a current rate x and a temperature y.  
E.g. CC/3,25°C,DCH means the discharge capacity at 25 °C and a current rate of C/3.

1. SOC = *Qel* / CRPT  
   Explanation: The state-of-charge (SOC) of the battery cell is calculated based on the current electrical charge load of the cell referenced to CRPT. This is to be done even in case CRPT > CNOM (in contrast to definition 8).
2. SOHNOM = CC/3,25°C,DCH / CNOM

Explanation: The SOHNOM is calculated based on the latest CC/3,25°C,DCH capacity (from RPT process; only CC discharge capacity, without CV phase) referenced to the nominal capacity.

1. SOHRPT = CRPT / CRPT,0

Explanation: The SOHRPT is always calculated based on the latest RPT capacity referenced to the first RPT capacity.

1. INOM = CNOM / h  
   Explanation: Currents INOM are always based on the nominal cell capacity (CNOM) and do not change throughout the test duration.
2. IRPT = CRPT / h if CRPT < CNOM

IRPT = INOM if CRPT ≥ CNOM

IRPT = INOM before conduction of any RPT procedure

Explanation: Currents IRPT shall generally be based on the capacity of the latest RPT procedure (CRPT). In case the measured value of CRPT is higher than CNOM, the currents of IRPT shall be calculated based on CNOM and therefore equal the current INOM. This is to prevent high currents outside of the specified operating window.  
Additionally, in case an IRPT current is to be applied on a fresh cell that has not experienced any RPT procedure so far, IRPT shall also equal INOM.

1. Current Derating  
   Explanation: Unless otherwise specified, the applied current shall be derated in case the currents violate the operating window at any SOC for a given temperature throughout the charging or discharging process.

## Specific Description of the Test / Testplan

### Thermal Relaxation

Preconditioning

RPT (Capacity determination)

Loop over TSet

Fully charge cell and discharge to 50 %SoCRPT

Set to target temperature

Relax to thermal equilibrium

RPT (DCIR Pulses)

**Table 2:** **Specific experimental variables for thermal relaxation experiment.**

|  |  |  |
| --- | --- | --- |
| **TSet / °C** | **SOCRPT, Set / %** | **No. of Cycles** |
| 25 | 50 | 1 |
| -20 | 50 | 1 |
| -10 | 50 | 1 |
| 0 | 50 | 1 |
| 10 | 50 | 1 |
| 25 | 50 | 1 |
| 45 | 50 | 1 |
| 10 | 50 | 1 |
| Tmax – 5\* | 50 | 1 |
| 25 | 50 | 1 |

Table 3: Test procedure for thermal relaxation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Command** | **Parameter** | **Exit Condition** | **Comment** |
|  | **CYCLE-START-1** |  |  | **Pre-Cycle** |
|  | Set Temperature | *T* = 25 °C |  | Set temperature of climate chamber to 25°C |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference (difference initial climate chamber temperature to set climate chamber temperature) 6 min, at least 60 min. |
|  | Discharge | *I* = INOM/3 | *V* < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05⋅ INOM | CV part of CCCV discharge |
|  | Rest |  | *t* > 30 min |  |
|  | Charge | *I* = IRPT/3 | *V* > Vdyn,max | CC part of CCCV charge. |
|  | Charge | *V* = Vdyn,max | *I* < 0.05⋅ IRPT | CV part of CCCV charge |
|  | Set | Ah-Set = 0 |  | A fully charged cell is defined as 0 Ah. |
|  | Rest |  | *t* > 6 h |  |
|  | **CYCLE-END-1** | **COUNT = 1** |  |  |
|  | **CYCLE-START-2** |  |  | **CRPT Determination** |
|  | Discharge | *I* = INOM /3 | *V* < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05⋅ INOM | CV part of CCCV discharge.  **Determination of CRPT:** Set CRPT to the combined CCCV capacity of steps 13 and 14. |
|  | Rest |  | *t* > 6 h |  |
|  | **CYCLE-END-2** | **COUNT = 1** |  |  |
|  | **CYCLE-START-3** |  |  | **DCIR pulse and Charge the cell to SOCRPT,Set** |
|  | Charge | *I* = IRPT/3 | *V* > Vdyn,max | CC part of CCCV charge. |
|  | Charge | *V* = Vdyn,max | *I* < 0.05⋅ IRPT | CV part of CCCV charge |
|  | Set | Ah-Set = 0 |  | A fully charged cell is defined as 0 Ah. |
|  | Rest |  | *t* > 30 min |  |
|  | Discharge | *I* = IRPT /3  *V* = Vdyn,min | Ah- Set < -0.5 *CRPT*  *I* < 0.05⋅ INOM | Discharge step to the defined 50 % SOCRPT |
|  | Rest |  | *t* > 60 min |  |
|  | Discharge | *I* = 1 C | t < 30 s | Pulse in discharge direction |
|  | Rest |  | *t* > 60 min |  |
|  | Discharge | *I* = INOM/3 | *V* < Vdyn,min | CC part of CCCV discharge. |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05⋅ INOM | CV part of CCCV discharge |
|  | Rest |  | *t* > 30 min |  |
|  | Charge | *I* = IRPT/3 | *V* > Vdyn,max | CC part of CCCV charge. |
|  | Charge | *V* = Vdyn,max | *I* < 0.05⋅ IRPT | CV part of CCCV charge |
|  | Set | Ah-Set = 0 |  | A fully charged cell is defined as 0 Ah. |
|  | Rest |  | *t* > 30 min |  |
|  | Discharge | *I* = IRPT /3  *V* = Vdyn,min | Ah- Set < -x *CRPT*  *I* < 0.05⋅ INOM | Discharge step to the defined SOCRPT,Set |
|  | Rest |  | *t* > 30 min |  |
|  | **CYCLE-END-3** | **COUNT = 1** |  |  |
|  | **CYCLE-START-4** |  |  | **Set Temperature and relaxation** |
|  | Set Temperature | T = TSet |  | Set Temperature according to Table 2 |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference (difference initial climate chamber temperature to set climate chamber temperature) 6 min, at least 60 min. |
|  | **CYCLE-END-4** | **COUNT = n1** |  | **n1 cycles till all temperatures in Table 2 is completed.** |

### Continuous currents (Full DoD)

Preconditioning

RPT (Capacity determination)

Loop over TSet

Loop over Ix

Fully charge cell

Set to target temperature and relax to thermal equilibrium

Perform continuous discharge current test and relax to electrical equilibrium

Set to 25 °C and relax to thermal equilibrium

Discharge with CC-CV until cell is empty (~0 %SoCRPT) and relax to elec. equilibrium

Set to target temperature and relax to thermal equilibrium

Perform continuous charge current test and relax to electrical equilibrium

Charge with CV until cell is full (~100 %SoCRPT) and relax to electrical equilibrium

Set to 25 °C and relax to thermal equilibrium

**Table 4: Specific experimental variables for full DoD continuous current tests.**

|  |  |  |
| --- | --- | --- |
| **TSet /** °C | **I/A** | **No. of Cycles** |
| +25 | Imax, cont | 1 |
| +25 | C/3 | 1 |
| 0 | Imax, cont | 1 |
| 0 | 1C | 1 |
| -10 | Imax, cont | 1 |
| -10 | C/5 | 1 |

**Table 5: Test procedure for Full DoD continuous current experiment**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Command** | **Parameter** | **Exit Condition** | **Comment** |
|  | **CYCLE-START-1** |  |  | **Pre - Cycle** |
|  | Set Temperature | *T* = 25 ° C |  | Set temperature of climate chamber to 25 °C |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference (difference initial climate chamber temperature to set climate chamber temperature) 6 min, at least 60 min. |
|  | Discharge | *I* = INOM/3 | *V* < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05⋅ INOM | CV part of CCCV discharge |
|  | Rest |  | *t* > 30 min |  |
|  | Charge | *I* = IRPT/3 | *V* > Vdyn,max | CC part of CCCV charge. |
|  | Charge | *V* = Vdyn,max | *I* < 0.05⋅ IRPT | CV part of CCCV charge |
|  | Set | *Ah-Set* = 0 |  | A fully charged cell is defined as 0 Ah. |
|  | Rest |  | *t* > 6 h |  |
|  | **CYCLE-END-1** | **COUNT = 1** |  |  |
|  | **CYCLE-START-2** |  |  | **CRPT Determination** |
|  | Discharge | *I* = INOM /3 | *V* < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05⋅ INOM | CV part of CCCV discharge.  **Determination of CRPT**: Set CRPT to the combined CCCV capacity of steps 13 and 14. |
|  | Rest |  | *t* > 6 h |  |
|  | Charge | *I* = IRPT/3 | *V* > Vdyn,max | CC part of CCCV charge. |
|  | Charge | *V* = Vdyn,max | *I* < 0.05⋅ IRPT | CV part of CCCV charge |
|  | Set | *Ah-Set* = 0 |  | A fully charged cell is defined as 0 Ah. |
|  | Rest |  | *t* > 30 min |  |
|  | **CYCLE-END-2** | **COUNT = 1** |  |  |
|  | **CYCLE-START-3** |  |  | **Temperature loop** |
|  | **CYCLE-START-4** |  |  | **Current loop** |
|  | Set Temperature | T = TSet |  | Set climate chamber to TSet according to Table 4. |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference 6 min, at least 60 min. |
|  | Discharge | *I* = xx\* | *V* < Vdyn,min | Discharge with CC to lower dynamic voltage based on nominal capacity.  \*I is chosen according to the supporting points in Table 4. |
|  | Rest |  | *t* > 30 min |  |
|  | Set Temperature | *T* = 25 ° C |  | Set temperature of climate chamber to 25 °C |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference (difference initial climate chamber temperature to set climate chamber temperature) 6 min, at least 60 min. |
|  | Discharge | *I* = INOM /3 | V < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05⋅ INOM | CV part of CCCV discharge |
|  | Rest |  | *t* > 30 min |  |
|  | Set Temperature | T = TSet |  | Set climate chamber to TSet according to Table 4. |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference 6 min, at least 60 min. |
|  | Charge | *I* = xx\* | *V* > Vdyn,max | Discharge with CC to lower dynamic voltage based on RPT capacity (CRPT).  I is chosen according to the supporting points in Table 4. |
|  | Rest |  | *t* > 30 min |  |
|  | Set Temperature | *T* = 25 ° C |  | Set temperature of climate chamber to 25 °C |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference 6 min, at least 60 min. |
|  | Charge | *I* = IRPT/3 | *V* > Vdyn,max | CC part of CCCV charge. |
|  | Charge | *V* = Vdyn,max | *I* < 0.05⋅ IRPT | CV part of CCCV charge |
|  | Rest |  | *t* > 30 min |  |
|  | **CYCLE-END-4** | **COUNT = n1** |  | **n1 cycles till all the currents in Table 4 are completed.** |
|  | **CYCLE-END-3** | **COUNT = n2** |  | **n2 cycles till all the temperatures in TSet in Table 4 are completed.** |

### Continuous currents (Partial DoD)

Preconditioning

RPT (Capacity determination)

Loop over TSet

Loop over Ix

Fully charge cell and set to 50 %SoCRPT

Set to target temperature and relax to thermal equilibrium

Perform continuous discharge current test and relax to electrical equilibrium

Set to 25 °C and relax to thermal equilibrium

Discharge with CC-CV until cell is empty (~0 %SoCRPT) and relax to elec. equilibrium

Charge with C/3 to 50 %SoCRPT and relax to electrical equilibrium

**Table 6: Specific experimental variables for partial DoD continuous current tests.**

|  |  |  |  |
| --- | --- | --- | --- |
| **TSet /** °C | **SoCRPT, Set / %** | **I/A** | **No. of Cycles** |
| 25 | 50 | Imax, cont | 1 |
| 25 | 60 | 1C | 2 |
| 20 | 70 | 2C | 3 |

**Table 7: Test procedure for Partial DoD continuous current experiment**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Command** | **Parameter** | **Exit Condition** | **Comment** |
|  | **CYCLE-START-1** |  |  | **Pre - Cycle** |
|  | Set Temperature | *T* = 25 ° C |  | Set temperature of climate chamber to 25 °C |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference (difference initial climate chamber temperature to set climate chamber temperature) 6 min, at least 60 min. |
|  | Discharge | *I* = INOM/3 | *V* < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05. INOM | CV part of CCCV discharge |
|  | Rest |  | *t* > 30 min |  |
|  | Charge | *I* = IRPT/3 | *V* > Vdyn,max | CC part of CCCV charge. |
|  | Charge | *V* = Vdyn,max | *I* < 0.05. IRPT | CV part of CCCV charge |
|  | Set | *Ah-Set* = 0 |  | A fully charged cell is defined as 0 Ah. |
|  | Rest |  | *t* > 6 h |  |
|  | **CYCLE-END-1** | **COUNT = 1** |  |  |
|  | **CYCLE-START-2** |  |  | **CRPT Determination** |
|  | Discharge | *I* = INOM /3 | *V* < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05. INOM | CV part of CCCV discharge.  **Determination of CRPT**: Set CRPT to the combined CCCV capacity of steps 13 and 14. |
|  | Rest |  | *t* > 6 h |  |
|  | Charge | *I* = IRPT/3  *V* = Vdyn,max | *Ah-Set >* -X CRPT  SOC > X %  *I* < 0.05.IRPT | Adjust the SOC to SoCRPT, Set |
|  | Rest |  | *t* > 30 min |  |
|  | **CYCLE-END-2** | **COUNT = 1** |  |  |
|  | **CYCLE-START-3** |  |  | **Temperature loop** |
|  | **CYCLE-START-4** |  |  | **Current loop** |
|  | Set Temperature | T = TSet |  | Set climate chamber to TSet according to Table 6. |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference 6 min, at least 60 min. |
|  | Discharge | *I* = xx\* | *V* < Vdyn,min | Discharge with CC to lower dynamic voltage based on nominal capacity.  \*I is chosen according to the supporting points in Table 4. |
|  | Rest |  | *t* > 30 min |  |
|  | Set Temperature | *T* = 25 ° C |  | Set temperature of climate chamber to 25 °C |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference (difference initial climate chamber temperature to set climate chamber temperature) 6 min, at least 60 min. |
|  | Discharge | *I* = INOM/3 | *V* < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05. INOM | CV part of CCCV discharge |
|  | Rest |  | *t* > 30 min |  |
|  | Charge | *I* = IRPT/3  *V* = Vdyn,max | *Ah-Set >* -X CRPT  SOC > X %  *I* < 0.05. IRPT | Adjust the SOC to SoCRPT, Set |
|  | Rest |  | *t* > 30 min |  |
|  | **CYCLE-END-4** | **COUNT = n1** |  | **n1 cycles till all the currents in Table 6 are completed.** |
|  | **CYCLE-END-3** | **COUNT = n2** |  | **n2 cycles till all the temperatures in TSet in Table 6 are completed.** |

### Charge neutral pulses

Preconditioning

RPT (Capacity determination)

Loop over TSet

Charge neutral pulse loop

Fully charge cell and set to 50 %SoCRPT

Set to target temperature and relax to thermal equilibrium

30 s discharge with Imax\_ch,cont

30 s charge with Imax\_ch,cont

Relax to electrical equilibrium

**Table 8: Specific experimental variables for charge neutral pulse experiment.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TSet / °C** | **SoCRPT, Set / %** | **Ipulse /A** | **tpulse / s** | **Number of pulses (n1)** |
| +25 | 50 | Imax charge, cont (of TSet) | 30 | 240 |

**Table 9: Test procedure for Charge neutral pulse experiment**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Command** | **Parameter** | **Exit Condition** | **Comment** |
|  | **CYCLE-START-1** |  |  | **Pre - Cycle** |
|  | Set Temperature | *T* = 25 ° C |  | Set temperature of climate chamber to 25 °C |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference (difference initial climate chamber temperature to set climate chamber temperature) 6 min, at least 60 min. |
|  | Discharge | *I* = INOM/3 | *V* < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05⋅ INOM | CV part of CCCV discharge |
|  | Rest |  | *t* > 30 min |  |
|  | Charge | *I* = IRPT/3 | *V* > Vdyn,max | CC part of CCCV charge. |
|  | Charge | *V* = Vdyn,max | *I* < 0.05⋅ IRPT | CV part of CCCV charge |
|  | Set | *Ah-Set* = 0 |  | A fully charged cell is defined as 0 Ah. |
|  | Rest |  | *t* > 6 h |  |
|  | **CYCLE-END-1** | **COUNT = 1** |  |  |
|  | **CYCLE-START-2** |  |  | **CRPT Determination** |
|  | Discharge | *I* = INOM /3 | *V* < Vdyn,min | CC part of CCCV discharge |
|  | Discharge | *V* = Vdyn,min | *I* < 0.05⋅ INOM | CV part of CCCV discharge.  **Determination of CRPT**: Set CRPT to the combined CCCV capacity of steps 13 and 14. |
|  | Rest |  | *t* > 6 h |  |
|  | Charge | *I* = IRPT/3  *V* = Vdyn,max | *Ah-Set >* -X CRPT  SOC > X %  *I* < 0.05⋅ IRPT | Adjust the SOC to SoCRPT, Set |
|  | Rest |  | *t* > 30 min |  |
|  | **CYCLE-START-3** |  |  | **Temperature loop** |
|  | Set Temperature | T = TSet |  | Set climate chamber to TSet according to Table 8. |
|  | Rest |  | *t* > 60 min\* | Resting time for thermal relaxation of the cell.  \*Rest the cell for each Kelvin temperature difference 6 min, at least 60 min. |
|  | **CYCLE-START-4** |  |  | **Charge neutral pulse loop** |
|  | Discharge | *I* = Ipulse | *t > tpulse* |  |
|  | Charge | *I* = Ipulse | *t > tpulse* |  |
|  | **CYCLE-END-4** | **COUNT = n1** | t > 4 h  T > Tmax | **n1 cycles for 4 h and only to be stopped in between when T > Tmax of the cell** |
|  | Rest |  | *t* > 30 min |  |
|  | **CYCLE-END-3** | **COUNT = n2** |  | **n2 cycles till all the temperatures in TSet in Table 8 are completed.** |

# Evaluation and reports

All measuring data shall be provided according to measurement data specification DTC-O-2 as per the latest version.