

The **National Renewable Energy Centre of Spain – CENER-** is a technology center specialized in applied research and development. CENER's six areas of activity are: Wind Energy, Photovoltaic Solar Energy, Solar Thermal Energy, Biomass Energy, Bioclimatic Architecture and Renewable Energy Grid Integration.

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TESTING SERVICES – SOLAR STORE TESTING TO THE EN 12977 STANDARD

These tests are done according to the European Standard EN 12977-3, "Thermal solar systems and components – Custom built systems / Part 3: Performance test methods for solar water heater stores applicable to stores used in solar hot water systems" or EN 12977-4 "Thermal solar systems and components – Custom built systems / Part 4: Performance test methods for solar combistores", both are applicable to stores with nominal volumes between 50 l and 1.000 l.



The test procedure consists in different testing sequences which characterize different parts of the store:

Sequence C: Determination of the store volume, the heat transfer capacity rate of the lowest heat exchanger and the thermal stratification during discharge

Sequence S: Determination of the thermal stratification during discharge with a 'high' flow rate

Sequence L: Determination of the heat loss capacity rate of the entire store during stand-by

Sequence NiA: Determination of the heat transfer capacity rate and the position of the auxiliary heat exchanger(s) (for stores with auxiliary heat exchanger(s))

Sequence EiA: Determination of the position and length of the electrical heating element(s) (for stores with electrical heating elements)

Sequences NiA and NiB or Sequences EiA and EiB: Determination of the degradation of thermal stratification during stand-by

Sequences CD, CI, DD, DI: Determination of the heat transfer capacity rate and degradation of thermal stratification during stand-by for solar combistores.