

This sub-technology category was removed from the ETL on 22nd March 2018.

Localised Rapid Steam Generators

Date added to ETL 2003 (Revised 2013).

1. Definition of Technology

Localised rapid steam generators are products that are specifically designed to convert water into pressurised steam by means of a burner that converts fuel into heat and a heat exchanger that transfers the heat into the water as it passes through the product, and to achieve full operating steam pressure within a few minutes of being turned on, from a cold condition.

2. Technology Description

Localised rapid steam generators are steam boilers with a low water capacity that are designed to be installed close to the point of use, thereby avoiding the thermal losses associated with steam distribution from a central boiler-house. Their low thermal inertia means that they can respond rapidly to changes in demand.

Localised rapid steam generators are available in a range of different designs and efficiencies. The ECA scheme aims to encourage the purchase of the higher efficiency gas and oil fired localised rapid steam generators.

The ECA Scheme covers two categories of product:

1. Localised Rapid Steam Generators sold with an economiser
2. Localised Rapid Steam Generators sold without an economiser

Investments in localised rapid steam generators can only qualify for Enhanced Capital Allowances if the specific product is named on the Energy Technology Product List. To be eligible for inclusion on the Energy Technology Product List, products must meet the eligibility criteria as set out below.

3. Eligibility Criteria

To be eligible, products must:

- Be gas and/or oil fired.
- Use an appropriately matched forced draught burner (or burners).
- Automatically respond to changes in steam demand by modulating their output in a continuous manner across a minimum specified turndown ratio, as set out in the performance criteria below, without initiating a purge cycle.
- Conform to the requirements of the Pressure Equipment Directive 97/23/EC in respect of their design, manufacturer and testing procedures, or be CE Marked.

In addition, products with a thermal output in excess of 400kW must either use burners from the “burners with controls” part of the Energy Technology Product List or:

- Incorporate a microprocessor based burner control system.
- Where mechanical dampers are used to modulate the **air flow** to the burners, they must be operated by a precision servomotor. The servomotor must be controlled by a positional or flow based feedback mechanism that automatically adjusts its operation to correct for mechanical wear, valve stiction and hysteresis.
- Where control valves are used to modulate the **fuel flow** to the burners, they must be operated by a precision servomotor. The servomotor must be controlled by a positional or flow based feedback mechanism that automatically adjusts its operation to correct for mechanical wear, valve stiction and hysteresis. (This requirement shall not apply to pneumatically operated modulating gas valves).
- Where the product is gas fired or dual fuelled, use a variable speed motor controller (or variable speed drive) to operate each forced draught fan incorporated into the product.

Performance criteria

Eligible products must meet or exceed the minimum thermal efficiencies set out in Table 1 below at the specified part and full load conditions, which vary according to product category and fuel type.

Table 1 - Performance test points for localised rapid steam generators

Product Category	Fuel Type	Turndown ratio	Test point % MCR	Net thermal efficiency %
Localised Rapid Steam Generators sold <u>with</u> an economiser	Gas fired or dual fuelled	3.33:1	30	>= 92.0%
			100	>= 92.0%
	Oil fired	2:1	50	>= 92.0%
			100	>= 92.0%
Localised Rapid Steam Generators sold <u>without</u> an economiser	Gas fired or dual fuelled	3.33:1	30	>= 88.0 %
			100	>= 88.0 %
	Oil fired	2:1	50	>= 88.0 %
			100	>= 88.0 %

">=" means "greater than or equal to"

Where MCR is the product's maximum continuous rating (MCR).

For the avoidance of doubt net thermal efficiency test data must be presented to 1 decimal place. As an example, a Localised Rapid Steam Generators sold without an economiser with a net thermal efficiency of 87.9% at 100% of its maximum continuous rating (MCR) would be deemed to be a fail.

Products must also:

- Be capable of achieving maximum working pressure in less than eight minutes starting with a water temperature of less than 25 degrees Centigrade.

Required test procedures

The required minimum performance must be demonstrated using Method A or Method B, as set out in Table A and Table B below.

Method A must only be used, where the all burners incorporated in the product are listed on the “burners with controls” part of the Energy Technology Product List.

Method B must be used to demonstrate the performance of modular boilers, or where any of the burners incorporated in the product are **NOT** listed on the “burners with controls” part of the Energy Technology Product List. A modular boiler is defined as an assembly of two or more similar (but not necessarily identical) modules, each with their own a heat exchanger, burner, and control and safety devices. The assembly has common water feed and steam output connections, but the water flow to, and steam flow from each module is independently controlled.

Representative Testing

Where applications are being made for localised rapid steam generators of the same constructional design to be included on the Energy Technology Product List (ETPL), the type testing procedures set out in Annex F of BS EN 303-3:1999 or Annex C.2.1 of BS EN 304:1992 (as amended) may be used to select representative models for testing and to reduce the overall number of performance tests that must be completed.

It should be noted that:

- If a manufacturer voluntarily removes a representative model from the ETPL then other products linked with that representative model may or may not be permitted to remain on the ETPL.
- If any product submitted under these representative model rules is later found not to meet the performance criteria when independently tested, then all products based on the same representative models will be removed from the ETPL.

TABLE A METHOD A - SEPARATE TESTING OF STEAM GENERATORS AND BURNERS

Under this test method:

1. Steam generator and burner performance are demonstrated separately.
2. Steam generator performance can be assessed using any burner (or burners) that can provide the heat input and operational stability needed to complete the test.
3. There is no requirement to measure the net thermal efficiency at part loads or standby losses, since these are inferred from burner performance requirements.

Steam generator performance must be demonstrated by measuring its net thermal efficiency at 100% of the product's maximum continuous rating (MCR) in accordance with the procedures set out in one of the following standards:

- BS 845:Part 1:1987 'Methods for Assessing thermal performance of boilers for steam, hot water and high temperature heat transfer fluids – Part 1: Concise procedure'.
- BS EN 12952-15:2003 'Water-tube boilers and auxiliary installations – Part 15: Acceptance tests'.

Where BS 845:Part 1:1987 is used, the standard test conditions that must be used are: a maximum ambient air temperature of 25 degrees Centigrade and an excess combustion air level of not less than 15%.

TABLE B	METHOD B - INTEGRATED PRODUCT TESTING AT FULL AND PART LOADS
<p>Under this test method, overall product performance must be demonstrated by:</p> <ol style="list-style-type: none"> 1. Measuring the net thermal efficiency at the test points specified in Table 1, in accordance with the procedures set out in one of the following standards: <ul style="list-style-type: none"> • BS 845:Part 1:1987 ‘Methods for Assessing thermal performance of boilers for steam, hot water and high temperature heat transfer fluids – Part 1: Concise procedure’. • BS EN 12952-15:2003 ‘Water-tube boilers and auxiliary installations – Part 15: Acceptance tests’. <p>Where BS 845:Part 1:1987 is used, the standard test conditions that must be used are: a maximum ambient air temperature of 25 degrees Centigrade and an excess combustion air level of not less than 15%.</p> 2. Estimating the standby loss rate from the amount of fuel required to restore the output steam pressure to its starting pressure after a suitable shutdown period. 	

4. Scope of Claim

Expenditure on the provision of plant and machinery can include not only the actual costs of buying the equipment, but other direct costs such as the transport of the equipment to site, and some of the direct costs of installation. Clarity on the eligibility of direct costs is available from [HMRC](#).