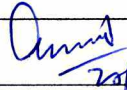




BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI - 620 014, INDIA

QUALITY ASSURANCE

CREEP TESTING REQUIREMENTS AS PER IBR

REV	DATE	PREPARED BY	REVIEWED BY	APPROVED BY
00	20/11/2017	Abdur Rahman Sultan	G. Panneer Selvam	Amit Roy
		 20/11/2017	 20/11/17	 20/11/17

RECORD OF REVISIONS

Rev. No.	Clause No.	Details of Revision
00	---	Fresh issue

1.0 SCOPE

Creep testing is required as per IBR for all alloy & stainless steels of pressure parts & valves used in boilers (Fossil & HRSG/CFBC/BFBC Boilers) being erected in India.

Creep testing is required for product forms like pipes, tubes, forgings, fittings, plates, castings, etc., whenever indicated in the Enquiry/Purchase Order/Engineering Drawing.

2.0 CREEP TESTING REQUIREMENTS

Creep testing shall be done in line with the following:

If starting raw material (Ingot, billet, bloom, etc.) is sourced from Indian steel makers, then, supplier shall produce the Creep test report for each material grade and product form being supplied by them as per the Table 1 given below:

Table 1. Creep Stress rupture testing Requirements

Sl. No	Steel Type and Grade	Testing hours – min. (hrs.)	Testing Temperature (°C)	Stress Value (MPa)	No. of tests & Specimen Size
1	Alloy Steels (AS) – Grade 11, 12 and Grade 22	1000	550	100	Two no. of tests with preferably M10 round sample
2	Alloy Steels (AS) – Grade 91, 92 and 23	1000	600	120	Two no. of tests with preferably M10 round sample
3	All Stainless Steels (SS) grades	1000	600	110	Two no. of tests with preferably M10 round sample

- Creep testing shall be done at National Metallurgical Laboratory, Jamshedpur or Corporate Research & Development Laboratory of Bharat Heavy Electricals Limited, Hyderabad.
- In case the supplier sources the raw materials (slabs/ingots/blooms, etc.) from more than one source, the creep tests shall be done for all the sources from whom they would source the steels for BHEL supply.
- Creep testing shall be done as per ASTM E139 (latest) or BS EN ISO 204 (latest).
- Acceptance Criteria:** The samples tested shall not rupture and shall meet the requirement of 1,000 hours of creep testing at indicated temperatures & stress values as per Table 1.
- Reporting: As per Table 2.

Table 2. Suggested/Recommended Format for Reporting the Creep Testing Data:

Sl No	Description	Details/Results
1	Name and Address of the Product Manufacturer	
2	Name and Address of the Raw Material Supplier	
3	Product Form	
4	Material Specification & Grade (Code Case, if applicable)	
5	Heat/Melt No, Sl No (if applicable)	
6	Heat treatment details (Type & Temperature)	
7	Name and Address of Testing Laboratory	
8	Testing method/ Standard (ASTM E139 or BS EN ISO 204) &	

	Revision/Edition	
9	Test Sample Size	
10	No. of test samples	
11	Temperature at which test is conducted (°C)	
12	Stress value observed (MPa)	
13	Test Start Date & Time	
14	Test End/Reporting Date & Time	
15	Test duration (hours of creep testing)	
16	% Elongation at the reporting/completion of test	
17	Test witnessed by (Name of Inspector & Agency)	
18	Test Result (Accepted/Not Accepted)	

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