


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		APROBADO/ APPROVED : AOE/JBE	

1. SCOPE

This document specifies the reports that the casting supplier must give to ECHESA for the parts of mid power gearboxes.

In the validation or in any change in the internal process of the supplier, this documentation is collected in a PAC (Component Approval Documentatio).

Once the validation is approved, then the inspection will reduced of level (less documentation required) while the process doesn't change aout of its limits.

2. COMPONENT APPROVAL DOCUMENTATION (PAC)

Following reports required:

2.1 DIMENSIONAL REPORT

Of the values specified in the casting drawing.

2.2 NDT REPORT

Characteristics of the equipment and if necessary, location of the deffect must be reported with ECHESA's template.

2.2.1 Ultrasonic inspection

PAC will be inspectioned in the entire part, as per EQ009003, being the areas specifed in that document those on the quality drawing of each kinf of part.

2.2.2 PM Inspection

PAC will be inspectioned with PM as per EQ009003, in the areas specified on the quality drawing.

2.3 DESTRUCTIVE TEST REPORT

Certificate according to EN-10204-3.1.B.

Samples will be machined from a sample attached to the part according to UNE-EN 1563 taking into account the determinant thickness and located as per the quality drawing.

Samples will be test as follows:

2.3.1 Metalographic test

For each ladle

2.3.1.1 Graphite analysis

Structure must be minimum 85-90% of V or VI type nodules (A distribution) and of mostly 6 to 7 size according to UNE-EN ISO 945. Size in the attached sample, mostly 5.

2.3.1.2 Matrix analysis

Mainly perlitic and with mimimum 3% of cementite and other carbides in grain boundaries.

2.3.2 Mechanical properties

Will be reported including errors, although the final results are satisfactory.

2.3.2.1 Tensile test

According to UNE-EN 1563.

2.3.2.2 Hardness test

According to UNE-EN 1563.


2.3.3 Chemical analysis

In each ladle, this elements must be reported:

C, Si, Mn, S, Mg, Al, P, Ni, Cu.

2.4 CONTROLLED COOLING PROCESS

Supplier must repor this cycle to guarantee the correct structure and mechanical properties.

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2.5 HEAT TREATMENT REPORT

If it is necessary, this treatment will be documented in a register, specifying temperature vs. time.

2.6 SURFACE FINISH

Reporting after a visual inspection with this criteria:

2.6.1 Cast surface visual inspection

Cast surface must be according to grade Sa2^{1/2} in ISO 8501-1 after blasting.

The following quality levels must be achieved according to ISO 11971.

- Surface rugosity "A2" (75%, allowed 25% "A3")
- Non metallic inclusions "B2"
- Porosity "C2"
- Machining preparing "H3"

Evaluation done with SCRATA comparators(Steel Casting Research and Trade Association) according to ASTM A802.

Inspection must be done in the finished part.

Thos surfaces not to be machined, must be soft, with gradual transitions and without marks.

In not machined or machined areas, this deffects are not allowed:

- Cavities.
- Porosity.
- Sand dagging.
- Cold melting union.

2.7 REPAIRING

Repairing not allowed.

2.8 SURFACE TREATMENT REPORT

Certified as per EN 10204-3.1.B of the adherence of the painting according to UNE 48032/80, minimum quality required GT2.

3. REDUCED LEVEL INSPECTION

Once the manufacturing process is validated by the PAC, supplier will reduced the inspection level and the documentation required will be as follows:

3.1 NDT REPORT

Characteristics of the equipment and if necessary, location of the deffect must be reported with ECHESA's template.

3.1.1 Ultrasonic test

As per section 2.2.1.

3.1.2 PM inspection


As per section 2.2.2.

3.2 DESTRUCTIVE TEST REPORT

As per section 2.3.

3.3 CONTROLLED COOLING PROCESS

As per section 2.4.

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3.4 HEAT TREATMENT REPORT

As per section 2.5.

3.5 SURFACE FINISH


As per section 2.6.

3.6 REPAIRING

As per section 2.7.

3.7 SURFACE TREATMENT REPORT

As per section 2.8.

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REGISTRO DE CAMBIOS

Rev.	Fecha	Autor	Descripción
00	30/04/03	MNB	Versión inicial
01	15/05/03	MNB	Cambio de revisor
02	13/12/04	NOM	Cambios generales y llamada a EQ de GAMESA y Planos para inspección de ultrasonidos y PM