

1. Scope

This Specification document covers the minimum quality requirements for castings supplied to SPP Pumps Ltd.

2. Purpose

To give guidance to ensure that the process is carried out in a controlled and consistent manner to supply a fit for purpose quality casting to SPP Pumps Ltd.

3. Owners

SSE Manager

4. Related Documents

D-243 Casting Inspection Sheet

5. Revision History

Issue	Reason	Approved By	Date
01	New IMS document for supplier specification for castings	MR	11/02/2019
02	Additional detail in Section 5.4	MR	03/07/2019
03	Photos added to Section 5.4	MR	15/07/2019
04	Supplier Docs Email	MR	09/09/2019
05	Addition of split case casting delivery	MR	07/04/2021
06	Change of document owner to SSE Manager	CP	21/11/2025

6. Contents

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1.0 PATTERN EQUIPMENT

1.1 Storage

The holder will store the pattern to prevent any deterioration or damage.

1.2 Pattern Assessment

The pattern equipment will be assessed to evaluate the condition prior to use. If the pattern is deemed unsuitable then repair/replacement suggestions must be submitted to the Purchaser or Supplier Quality Engineer (SQE) before use.

2.0 SPLIT CASE CASINGS

2.1 Visual Inspection

- The surface of the casting shall be examined and shall be free from adhering sand, scale, cracks, hot tears, porosity and open holes.
- All joint lines or flash resultant of the casting process should be fettled smooth and blended back flush with the surface of the casting.
- Cored out passages shall be free of adhering sand, blockages, flash or other defects.
- Cored out passages with enclosed surfaces shall be free of adhering sand, blockages, flash or other defects.
- The cut water should be formed with the correct radius, no cracks or mismatch at the leading edge.

2.2 Inspection (Dimensional)

- The initial mould should be checked prior to casting with special attention given to the position of the cut water.
- All dimensions should be checked to ensure no significant core movement has occurred.
- Significant attention should be given to the position of the cut water. This should correspond to the dimensions given in Drawing DN42660 considering casting allowances.

2.3 Specific Delivery Requirements

Split case castings are to be received as matched pairs only from foundries, i.e. tops and bottoms.

3.0 BOWLS

3.1 Visual Inspection

- The surface of the casting shall be examined and shall be free from adhering sand, scale, cracks, hot tears, porosity and open holes. All joint lines or flash resultant of the casting process should be fettled smooth and blended back flush with the surface of the casting.
- Cored out passages shall be free of adhering sand, blockages, flash or other defects.
- Cored out passages with enclosed surfaces shall be free of adhering sand, blockages, flash or other defects.
- Leading edges of all vanes should be rounded and not square.

3.2 Inspection (Dimensional)

All dimensions shall be checked against the relevant drawing prior to despatch to ensure compliance.

4.0 IMPELLERS

4.1 Visual Inspection

- The surface of the casting shall be examined and shall be free from adhering sand, scale, cracks, hot tears, porosity and open holes. All joint lines or flash resultant of the casting process should be fettled smooth and blended back flush with the surface of the casting.
- Cored out passages shall be free of adhering sand, blockages, flash or other defects.
- Cored out passages with enclosed surfaces shall be free of adhering sand, blockages, flash or other defects.
- There shall be no buckling/distortion of the shroud, and the outlet ports should be of equal width.
- Check side of the vanes for surface roughness and dress if required.
- Leading edges of all vanes should be rounded and not square.

4.2 Inspection (Dimensional)

- All dimensions shall be checked against the relevant drawing prior to despatch to ensure compliance.
- Outlet width is to be checked over the whole circumference.
- Vane ends must be in line. Any mismatch greater than 1mm will not be acceptable.

5.0 GENERAL CASTINGS

5.1 Visual Inspection

- The surface of the casting shall be examined and shall be free from adhering sand, scale, cracks, hot tears, porosity and open holes. All joint lines or flash resultant of the casting process should be fettled smooth and blended back flush with the surface of the casting.
- Cored out passages shall be free of adhering sand, blockages, flash or other defects
- Cored out passages with enclosed surfaces shall be free of adhering sand, blockages, flash or other defects.

5.2 Inspection (Dimensional)

- All dimensions shall be checked against the relevant drawing prior to despatch to ensure compliance.
- Copies of inspection reports are to be sent with delivery documentation or prior to delivery.

5.3 Distortion and Chilling

- All castings should be free from distortion, stresses and chilling and shall be suitably heat treated to stress relieve.

5.4 Runners and Risers

All runners and risers shall be removed to 20mm above the relevant cast faces. The photograph in Figure 1 represents the requirements for excess riser removal. Where access is restricted for removal SPP SQE & Purchasing must be informed so that a reasonable solution can be agreed.



Figure 1

5.5 Surface Condition

Castings supplied shall be:

- Grease and oil free
- Free from burrs etc
- Free from excessive pitting and/or surface corrosion
- Free from surface breaking defects, such as porosity and linear discontinuities.

5.6 Inspection Post-Machining

Many of the cast products supplied to SPP Ltd will be subject to Liquid Penetrant Testing following machining. The acceptance criteria for indications is as per BS EN 1371-1 Table 1 & Table 2.

Part	Table 1 Severity level	Table 2 Severity Level
Pump Bowls	SP02, CP02	LP2, AP2
Other Parts	SP2, CP2	LP5, AP5

6.0 PROTECTION OF CASTINGS

6.1 Casting Categories

The surface treatment applicable to a cast component is a function of the material of construction. There are two categories of cast materials, they are:

CATEGORY "A" (SHOT BLASTED & PRIMED)

<u>Description</u>		<u>SPP Material Codes</u>
Cast Iron	- BS EN 1561:2011	123, 124, 125
Ni-Resist	- BS EN 13835:2012	171, 172, 173
Carbon Steel	- BS 3100	228
Spheroidal Graphite Iron	- BS EN 1563:2011	165, 168

CATEGORY "B" (SHOT BLASTED ONLY)

<u>Description</u>		<u>SPP Material Codes</u>
Stainless Steel	- BS 3100	945
Ferralium	- ASTM A890 12a	368
Bronzes	- BS EN 1982:2008	445, 454, 479, 484, 485
Aluminium	- BS EN 1706:2010	521, 524, 525, 532

6.2 Category “A” Requirements

- All castings shall be shot-blasted to remove all sand or foreign matter. The prepared surface shall follow ISO 8501-1:1988 designated Sa 2 ½.
- The prepared surface shall then be painted within four hours with a primer coat of High Build Etch Primer (or equivalent), single Pack in the colour Grey Green.
- The primer coat can be applied by brush, dip or spray methods but the supplier must ensure complete coverage of the casting with one uniform coat. The coating should have an average dry film thickness of 50 microns, ensuring that there is at least 25 microns above the highest peaks on the casting profile.

6.3 Category “B” Requirements

All castings cast in materials in category “B” shall be shot-blasted to remove all sand or foreign matter. The castings should be supplied to SPP in an un-primed condition.

7.0 DELIVERY REQUIREMENTS

7.1 Identification

Every item and/or batch of castings supplied to SPP Ltd shall be clearly and legibly identified with part identification and melt / heat numbers.

7.2 Packaging

All castings supplied shall be packaged in a manner as to prevent segregation, handling damage and deterioration during transit and handling and shall not exceed 2 tonnes in weight. Castings shall be packaged in batches of individual part numbers.

7.3 Documentation

All material certificates including any NDE, test house results, SPP checklists and dimensional reports shall be supplied by the supplier at the time of delivery or prior to the delivery. All test certificates shall be in accordance with BS EN 10204. Test certificates can be sent to supplier_docs@spppumps.com

7.4 Test Information

All test house reports showing chemical and mechanical results are to be presented with the documentation pack.

All test pieces are to be sent with the delivery of castings and clearly identified with part number and melt / cast / heat number.

7.5 NON-CONFORMING PRODUCT

CONCESSION

Any request for Concession from the required standard or from delivery requirements must be sought from the SPP Ltd SQE.

No materials will be accepted unless a written concession/agreement is granted from the Quality Manager prior to production or despatch. This concession/agreement or reference to the concession/agreement must be sent with the delivery it is relating to.

No rectification of defects by any welding process shall be carried out without the express written permission of SPP Ltd.'s SQE.

7.6 Cost Recovery

Any costs associated with non-conforming products (including local repair) will be recovered through the SPP Credit Recovery Process. These costs will include transport and administration.