

SG Iron Defect Analysis Questionnaire

1. General & Defect Baseline Information

Data Field	Description / Options	Details (To be filled by Data Field Description / Options Engineering)
Component Name / Part ID	Name and drawing/part number	OIL BOx
Material Grade	SG Iron Grade (e.g., GGG40, EN-GJS-400-15, 65-45-12, ADI)	EN-GJS-600-3
Defect Name / Type	Specific identification (e.g., Shrinkage, Pinholes, Dross/Slag inclusion, Chunky Graphite, Cold Shut)	CENTER LINE SHRINKAGE
Defect Location	Where does it occur? (e.g., Heavy section, Hotspot, Ingate, Drag/Cope side, Machined surface)	Under the feeder
Defect Frequency / Rejection Rate	% of total production or batch count affected	100%
Observation Point	Stage where defect is discovered (e.g., As-cast, Post-shot blast, After rough machining, Final NDT/UT)	The defect was discovered after machining.

SG Iron Defect Analysis Questionnaire

2. Geometry, Gating & Methoding Variables

Data Field	Description / Options	Details (To be filled by Engineering)
Section Thickness Range	Minimum vs. Maximum ruling section thickness (mm)	62mm
Pouring / Casting Weight	Net weight of casting vs. Gross weight (liquid metal poured)	45KG NET WEIGHT 58,5 Kg Gross
Yield Percentage	$\text{Net Weight} = \text{Yield \%} / \text{Gross Weight} \times 100\%$	26.325kg
Gating System Design	Pressurized, Unpressurized, Direct pouring, or Gated via Feeder?	Pressurized
Feeder / Riser Setup	Feeder size, shape, sleeve type (Exothermic / Insulating / Sand), neck dimensions	5mm Exothermic 15x15x100
Fillet & Radius Details	Are adequate radii provided at section transitions near the defect zone?	Yes

SG Iron Defect Analysis Questionnaire

3. Liquid Metal Chemistry & Treatment Data

Data Field	Description / Options	Details (To be filled by Engineering)
Base Chemistry (%)	C, Si, Mn, P, S (before nodulization)	C=3.65 Si=1.56 Mn= 0.365 Cu=0.34 P=0.017 S=0.020
Final Chemistry (%)	C, Si, Mn, P, S, Mg (residual), Cu, Ni, Cr, Mo, Sn	C=3.6 Si=1.99 Mn=0.33 P=0.014 S=0.015 Mg=0.044 Cu=0.32 Ni=0.002 Cr=0.085
Carbon Equivalent (CE)		4.43
Residual Magnesium	Exact residual Mg % in final sample	0.044
Nodulizing Alloy (FeSiMg)	Addition rate (%), alloy grade, Mg %, Ce/RE content	80% nodules
Inoculation Strategy	Stream, In-mold, or Ladle inoculation? Addition rate (%) and inoculant grain size	Inmould

SG Iron Defect Analysis Questionnaire

4. Melting & Pouring Parameters

Data Field	Description / Options	Details (To be filled by Engineering)
Furnace Type	Medium Frequency Induction, Arc Furnace, etc.	Induction
Tapping Temperature	Metal temperature at tap (°F)	1455 Degrees Celsius
Treatment Temperature	Temperature during FeSiMg Temperature nodulization (°F)	1455 degrees celsius
Pouring Temperature Range	Initial pouring temp vs. Final pouring temp (°F)	1380 degrees Celsius 1365 degrees celsius
Pouring Time & Rate	Total pour time per mold (seconds)	30s-45s
Fading Time	Elapsed time between nodulizing treatment and completion of pouring (minutes)	08 minutes

SG Iron Defect Analysis Questionnaire

5. Mold & Core Characteristics

Data Field	Description / Options	Details (To be filled by Engineering)
Molding Process	Green Sand, No-Bake / Resin Sand, Shell Molding, etc.	Resin sand
Mold Rigidity /Compaction	Mold hardness / compactability (%) / mold strength (Green Sand)	-
Sand Moisture & Volatiles	Moisture content (%), Loss on Ignition (LOI) %	3.68%
Core Binder & Gas Content	Resin type (Cold Box / Shell /Furan), binder %, gas evolution rate	Furan
Venting Details	Are core vents and mold top vents adequate and clear?	yes

SG Iron Defect Analysis Questionnaire

6. Metallographic & NDT Findings (If Available)

Data Field	Description / Options	Details (To be filled by Engineering)
Nodularity (%)	Microstructural nodularity percentage (e.g., >85%, Type I & II graphite)	80%
Nodule Count	Nodule count per mm^2	300
Matrix Structure	Pearlite %, Ferrite %, Carbide/Carbo-nitride presence	60% Pearlite 40% ferrite
Defect Morphology	SEM / Optical microscope observations (e.g., smooth gas cavity walls vs. dendrites)	
Non-Destructive Testing (NDT)	Radiography (RT), Ultrasonic (UT), Magnetic Particle (MPI), Dye Penetrant (DPT) results	

SG Iron Defect Analysis Questionnaire

7. Visual Attachment Checklist

Note: To facilitate rapid diagnosis, please attach the following media when submitting this query

Photos of the defect: Microscopic (20x–100x), close-up macro, and full part context.

Methoding Layout: Gating and risering scheme (3D CAD or 2D drawing showing ingates, runners, and feeders).

Thermal/Filling Simulation: Mold filling or solidification simulation results (if available).