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CoCo LOCOMOTIVE PROJECT Standards List

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1 INTRODUCTION

1.1 Scope of The Document

The scope of this document is to provide the main design standards followed by for the design, development and production of the CoCo Loco Project.

1.2 Reference Documents

N.A.

1.3 Acronyms & Abbreviations

EN	Euro Norm (European Standard)
IEC	International Electro technical Commission
ISO	International Standards Organization
IEC	International Electro technical Commission
RAMS	Reliability, Availability, Maintainability and Safety
SI	Système Internationale
TSI	Technical Specifications for Interoperability
UIC	Union Internationale des Chemins de Fer (International Union of Railways)
CSM	Common Safety Methods

2 DOCUMENTS AND STANDARDS

National Co-Co Type Mainline Locomotive Project General Technical Specification shall be designed, assembled and tested according to more recently published versions of EN, IEC, UIC, TSI as other international standards, respected in the order of priority.

Where it is impracticable to comply with these directives, standards and requirements, the conditions mandated by the other relevant international standards, the standards from the European countries, national standards and regulations and the national legislation may be used.

The directives, standards and requirements listed below by in the order of priority shall be abided by in all the works to be performed under the technical specifications and for the conditions required to be met by the National Co-Co Type Mainline Locomotive, equipment and sub-components addressed in this technical specification:

- Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union
- TSI LOC&PAS [Commission Regulation (EU) No 1302/2014 of 18 November 2014]
- TSI SRT [Commission Regulation (EU) No 1303/2014 of 18 November 2014]
- TSI CCS (with respect to Conformity Control) [Commission Implementing Regulation (EU) 2023/1695 of 10 August 2023]
- TSI NOI [Commission Regulation (EU) No 1304/2014 of 26 November 2014]
- CSM [Commission Implementing Regulation (EU) No 402/2013 of 30 April 2013]
- Technical documents and annexes thereto published for the relevant TSI directives
- EN STANDARDS
- UIC STANDARDS
- IEC, ISO, other international norms and standards (DIN, NF F, UNI, CEI, etc.)
- National standards (TS, etc.)

If a standard of higher priority contains omissions regarding the particular matter, such omissions will be removed by the next standard.

The Bidder/Contractor should satisfy the specific standards indicated in Table below; All the norms have to be with the version indicated in the current version of relevant TSI; if the norm is not listed in the relevant TSI, has to be applied the latest version of the norm available at the signature of the contract.

Refer to the following table for the list of main applicable norms.

Standard	Title
EN 286-3	Simple Unfired Pressure Vessels Designed to Contain Air or Nitrogen - Part 3: Steel Pressure Vessels Designed for Air Braking Equipment and Auxiliary Pneumatic Equipment for Railway Rolling Stock
EN 10220	Seamless and welded steel tubes - Dimensions and masses per unit length
EN 10089	Hot-rolled steels for quenched and tempered springs - Technical delivery conditions
EN 12080	Railway applications - Axleboxes - Rolling bearings
EN 12081	Railway applications - Axleboxes - Lubricating greases
EN 12082	Railway applications - Axleboxes - Performance testing
EN 1563	Founding - Spheroidal graphite cast irons
EN 12663-1	Railway applications - Structural requirements of railway vehicle bodies - Part 1: Locomotives and passenger rolling stock (and alternative method for freight wagons)
EN 13103-1	Railway applications - Wheelsets and bogies - Part 1: Design method for axles with external journals
EN 13260	Railway applications - Wheelsets and bogies - Wheelsets - Product requirements
EN 13261	Railway applications. Wheelsets and bogies. Axles. Product requirements
EN 13262	Railway applications. Wheelsets and bogies. Wheels. Product requirement
EN 13298	Railway applications - Suspension components - Helical suspension springs, steel
EN 13715	Railway applications - Wheelsets and bogies - Wheels - Tread profile
EN 13749	Railway applications - Wheelsets and bogies - Method of specifying the structural requirements of bogie frames
EN 13906-1	Cylindrical helical springs made from round wire and bar - Calculation and design - Part 1 : Compression springs
EN 13979-1	Railway applications - Wheelsets and bogies - Monobloc Wheels - Technical approval procedure - Part 1: Forged and rolled wheels
EN 14198	Railway applications - Braking - Requirements for the brake system of trains hauled by locomotives
EN 14363	Railway applications - Testing and Simulation for the acceptance of running characteristics of railway vehicles - Running Behaviour and stationary tests
EN 14531-2	Railway applications - Methods for calculation of stopping and slowing distances and immobilization braking - Part 2: Step by step calculations for train sets or single vehicles
EN 14535-1	Railway applications - Brake discs for railway rolling stock - Part 1: Brake discs pressed or shrunk onto the axle or drive shaft, dimensions and quality requirements
EN 14601	Railway applications - Straight and angled end cocks for brake pipe and main reservoir pipe
ISO 14731	Welding coordination – Tasks and responsibilities
EN 14813-1	Railway applications - Air conditioning for driving cabs - Part 1: Comfort parameters
EN 14813-2	Railway applications - Air conditioning for driving cabs - Part 2: Type tests
EN 15085-3	Railway applications - Welding of railway vehicles and components - Part 3: Design requirements
EN 15085-5	Railway applications - Welding of railway vehicles and components - Part 5: Inspection, testing and documentation
EN 15085-1	Railway applications. Welding of railway vehicles and components. General
EN 15085-4	Railway applications. Welding of railway vehicles and components. Production requirements
EN 15152	Railway applications - Windscreens for trains

Standard	Title
EN 15153-1	Railway applications - External visible and audible warning devices - Part 1: Head, marker and tail lamps for heavy rail
EN 15153-2	Railway applications - External visible and audible warning devices - Part 2: Warning horns for heavy rail
EN 15220	Railway applications - Brake indicators
EN 15227	Railway applications - Crashworthiness requirements for rail vehicles
EN 15273-1	Railway applications - Gauges - Part 1: General - Common rules for infrastructure and rolling stock
EN 15273-2	Railway applications - Gauges - Part 2: Rolling stock gauge
EN 15427-2-1	Railway applications - Wheel/Rail friction management - Part 2-1: Properties and Characteristics - Flange lubricants
EN 15437-1	Railway applications - Axlebox condition monitoring - Interface and design requirements - Part 1: Track side equipment and rolling stock axlebox
EN 15528	Railway applications - Line categories for managing the interface between load limits of vehicles and infrastructure
EN 15551	Railway applications - Railway rolling stock - Buffers
EN 15595	Railway applications. Braking. Wheel slide protection
EN 15566	Railway applications - Railway Rolling stock - Draw gear and screw coupling
EN 15611	Railway applications - Braking - Relay valves
EN 15614	Specification and qualification of welding procedures for metallic materials. Welding procedure test. Arc and gas welding of steels and arc welding of nickel and nickel alloys
EN 15663	Railway applications - Vehicle reference masses
EN 15624	Railway applications - Braking - Empty-loaded changeover devices
EN 15625	applications - Braking - Automatic variable load sensing devices
EN 15807	Railway applications - Pneumatic half couplings
EN 15827	Railway applications - Requirements for bogies and running gears
EN 15877-2	Railway applications - Markings of railway vehicles - Part 2: External markings on coaches, motive power units, locomotives and on track machines
EN 16019	Railway applications - Automatic coupler - Performance requirements, specific interface geometry and test method
EN 16116-1	Railway applications - Design requirements for steps, handrails and associated access for staff - Part 1: Passenger vehicles, luggage vans and locomotives
EN 50121-1	Railway applications - Electromagnetic compatibility - Part 1: General
EN 50121-2	Railway applications - Electromagnetic compatibility - Part 2: Emission of the whole railway system to the outside world
EN 50121-3-1	Railway applications - Electromagnetic compatibility - Part 3-1: Rolling stock - Train and complete vehicle
EN 50121-3-2	Railway applications - Electromagnetic compatibility - Part 3-2: Rolling stock - Apparatus
EN 50121-4	Railway applications - Electromagnetic compatibility - Part 4: Emission and immunity of the signalling and telecommunications apparatus
EN 50121-5	Railway applications - Electromagnetic compatibility - Part 5: Emission and immunity of fixed power supply installations and apparatus
EN 50153	Railway applications - Rolling stock - Protective provisions relating to electrical hazards
EN 50238	Railway applications - Compatibility between rolling stock and train detection systems
EN 45545-1-7	Railway applications - Fire protection on railway vehicles
EN 3-7	Portable fire extinguishers - Part 7: Characteristics, performance requirements and test methods
UIC 518	Testing and approval of railway vehicles from the point of view of their dynamic behaviour - Safety – Track fatigue - Running behaviour
UIC 521	Coaches and vans, wagons, tractive stock - Clearance to be provided at vehicle extremities
UIC 541-1	Brakes - Brake cylinders/units for air brakes - General conditions for certification and use

Standard	Title
UIC 541-4	Brakes - Regulations concerning the manufacture of brake components - Self-adjusting load-proportional braking system and automatic "empty-loaded" control device
UIC 542	Brake parts - Interchangeability
UIC 544-1	Brakes – Braking performance
UIC 552	Electrical power supply for trains – Standard technical characteristics of the train line
UIC 558	Describes a 13-conductor cable and connectors used for transmitting a variety of data and commands between a locomotive and passenger carriages
UIC 568	Train Communication Network (TCN as in IEC61375) with 18-conductor cable and connector. 13-wire plugs can be connected to an 18-pin socket, and the signals from the 13-wire cable carried through and the remaining five wires are used for the Train Communication Network (TCN)-bus and side-sensitive door control
UIC 612	Driver Machine Interfaces for EMU/DMU, Locomotives and Driving Coaches- Functional and System Requirements associated with harmonised Driver-Machine-Interfaces
UIC 615-1	Tractive units – Bogies and running gear – General conditions applicable to component parts
UIC 651	Layout of driver's cabs in locomotives, railcars, multiple unit trains and driving trailers
UIC 545	Brakes - Inscriptions, marks and signs
UIC 640	Motive power units - Inscriptions, marks and signs
IEC 60310	Railway applications - Traction transformers and inductors on board rolling stock
IEC 61375-2-8	Electronic railway equipment - Train communication network (TCN) - Part 2-8: TCN conformance test
EN 50388-1	Railway Applications - Fixed installations and rolling stock - Technical criteria for the coordination between electric traction power supply systems and rolling stock to achieve interoperability - Part 1: General
EN 50163	Railway applications - Supply voltages of traction systems
EN 50124-1	Railway applications - Insulation coordination - Part 1: Basic requirements - Clearances and creepage distances for all electrical and electronic equipment
EN 50124-2	Railway applications - Insulation coordination - Part 2: Overvoltages and related protection
EN 50125-1	Railway applications - Environmental conditions for equipment - Part 1: Rolling stock and on-board equipment
EN 50125-2	Railway applications - Environmental conditions for equipment - Part 2: Fixed electrical installations
EN 50343	Railway applications - Rolling stock - Rules for installation of cabling
IEC 60571	Railway applications - Electronic equipment used on rolling stock
EN 61287-1	Railway applications - Power converters installed on board rolling stock - Part 1: Characteristics and test methods
EN 61373	Railway applications - Rolling stock equipment - Shock and vibration tests
EN 60349-2	Electric traction - Rotating electrical machines for rail and road vehicles - Part 2: Electronic converter-fed alternating current motors
EN 61287-1	Railway applications - Power converters installed on board rolling stock - Part 1: Characteristics and test methods
EN 50155	Railway applications - Rolling stock - Electronic equipment
EN 50119	Railway applications - Fixed installations - Electric traction overhead contact lines
EN 50128	Railway applications - Communication, signalling and processing systems - Software for railway control and protection systems
EN 50129	Railway applications - Communication, signalling and processing systems - Safety related electronic systems for signalling
EN 50206-1	Railway applications - Rolling stock - Pantographs: Characteristics and tests - Part 1: Pantographs for main line vehicles
EN 50264-1	Railway applications - Railway rolling stock power and control cables having special fire performance - Part 1: General requirements
EN 50264-3-1	Railway applications - Railway rolling stock power and control cables having special fire performance - Part 3-1: Cables with crosslinked elastomeric insulation with reduced dimensions - Single core cables

Standard	Title
EN 50264-3-2	Railway applications - Railway rolling stock power and control cables having special fire performance - Part 3-2: Cables with crosslinked elastomeric insulation with reduced dimensions - Multicore cables
EN 50317	Railway applications - Current collection systems - Requirements for and validation of measurements of the dynamic interaction between pantograph and overhead contact line
EN 50318	Railway applications - Current collection systems - Validation of simulation of the dynamic interaction between pantograph and overhead contact line
EN 50388-1	Railway Applications - Fixed installations and rolling stock - Technical criteria for the coordination between electric traction power supply systems and rolling stock to achieve interoperability - Part 1: General
EN 50463-1-3-4-5	Railway applications - Energy measurement on board trains
EN 50463-2	Railway applications - Energy measurement on board trains
EN 50533	Railway applications - Three-phase train line voltage characteristics
EN 50547	Railway applications - Batteries for auxiliary power supply systems
EN 60077	Railway applications - Electric equipment for rolling stock
EN 60322	Railway applications - Electric equipment for rolling stock - Rules for power resistors of open construction
IEC 60099-4	Surge arresters - Part 4: Metal-oxide surge arresters without gaps for a.c. systems
IEC 61984	Connectors - Safety requirements and tests
EN 50500	Measurement procedures of magnetic field levels generated by electronic and electrical apparatus in the railway environment with respect to human exposure
ERA/ERTMS/033281	Interfaces between Control-Command and Signalling Trackside and Other Subsystems
EN 50126-1	Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 1: Generic RAMS Process
EN 50126-2	Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability and Safety (RAMS) - Part 2: Systems Approach to Safety
EN 50129	Railway applications - Communication, signalling and processing systems - Safety-related electronic systems for signalling
IEC TR 62278-4	Railway applications - Specification and demonstration of reliability, availability, maintainability and safety (RAMS) - Part 4: RAM risk and RAM life cycle aspects
EN 60529	Degrees of protection provided by enclosures (IP Code)
IEC 61133	Railway applications - Rolling stock - Testing of rolling stock on completion of construction and before entry into service
EN ISO 2162-2	Technical product documentation - Springs - Part 2: Presentation of data for cylindrical helical compression springs (ISO 2162-2:1993)
EN ISO 3381	Railway applications - Acoustics - Noise measurement inside railbound vehicles
EN ISO 3095	Acoustics - Railway applications - Measurement of noise emitted by railbound vehicles (ISO 3095:2013)
EN ISO 9614-1	Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 1: Measurement at discrete points (ISO 9614-1:1993)
IRS 50561	Railway Application - Rolling Stock, Interconnecting gangway systems between vehicles
IRS 50558	Train Communication network (TCN) based on Ethernet technology (IEC-61375-2-5)
IRS 70017	Railway Application - Fixed Installations - Evaluation of incidents on the railway energy system
IRS 50641	Railway Application - Rolling Stock - Conditions to be fulfilled by automatic vigilant devices used in international traffic
IRS 50405	Railway Application - Rolling Stock - Specification "Diagnostic Data Transmission" from railway vehicles
IRS 70014	Railway Application - Fixed Installations - Maintenance Guidelines for OCL
IRS 70015	Railway Application - Fixed Installations - Diagnosis of OCL Conditions
IRS 70016	Railway Application - Fixed Installations - Safety measures to adopt when working on or nearby OCL
IRS 70017	Railway Application - Fixed Installations - Guidelines on OCL earthing systems for safety in tunnels
IRS 70018	Railway Application - Fixed Installations - Guidelines on OCL earthing systems for safety in tunnels

Standard	Title
IRS 70019	Railway Application - Fixed Installations - Overhead Contact Lines interoperability assessment
EN 16839	Railway applications - Rolling stock - Head stock layout
EN 16404	Railway applications - Re-railing and recovery requirements for railway vehicles
EN 14531-1	Railway applications - Methods for calculation of stopping distances, slowing distances and immobilization braking - Part 1: General algorithms
EN 16207	Railway applications - Braking - Functional and performance criteria of Magnetic Track Brake systems for use in railway rolling stock
EN 14752	Railway applications - Bodyside entrance systems for rolling stock
EN 14067-6	Railway applications - Aerodynamics - Part 6: Requirements and test procedures for crosswind assessment
EN 50388-1	Railway Applications - Fixed installations and rolling stock - Technical criteria for the coordination between electric traction power supply systems and rolling stock to achieve interoperability - Part 1: General
EN 50367	Railway applications - Fixed installations and rolling stock - Criteria to achieve technical compatibility between pantographs and overhead contact line
EN/IEC 62625-1	Electronic railway equipment - On board driving data recording system -Part 1: System specification
EN 1363-1	Fire resistance tests - Part 1: General Requirements
EN 13272-1	Railway applications - Electrical lighting for rolling stock in public transport systems - Part 1: Heavy rail
EN 50553	Railway applications - Requirements for running capability in case of fire on board of rolling stock
EN 16362	Railway applications - Ground based services - Water restocking equipment
EN/IEC 60309-2	Plugs, socket-outlets and couplers for industrial purposes - Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories
EN 15020	Railway applications - Rescue coupler - Performance requirements, specific interface geometry and test methods
EN 50405	Railway applications - Current collection systems - Pantographs, testing methods for contact strips
EN 13674-1	Railway applications - Track - Rail - Part 1: Vignole railway rails 46 kg/m and above
EN 14067-4	Railway applications - Aerodynamics - Part 4: Requirements and test procedures for aerodynamics on open track
EN 14067-5:	Railway applications - Aerodynamics - Part 5: Requirements and test procedures for aerodynamics in tunnels
EN 12663-2	Railway applications - Structural requirements of railway vehicle bodies - Part 2: Freight wagons
CLC/TS 50534	Railway applications - Generic system architectures for onboard electric auxiliary power systems
IEC 61375-1	Electronic railway equipment –Train communication network (TCN) –Part 1: General architecture
EN 16286-1	Railway applications - Gangway systems between vehicles - Part 1: Main applications
IRS UIC 50558	Railway Application - Rolling Stock - Remote control and data cables interfaces - Standard technical features
EN 16186-1	Railway applications - Driver's cab - Part 1: Anthropometric data and visibility
EN 16834	Railway applications - Braking - Brake performance
EN 14478	Railway applications - Braking - Generic vocabulary
EN 15328	Railway applications - Braking - Brake pads
EN 16452	Railway applications - Braking - Brake blocks
UIC 541-6	Brakes - Electropneumatic brake (ep brake) and Passenger alarm signal (PAS) for vehicles used in hauled consists
EN 17065	Railway applications - Braking - Passenger coach test procedure
EN/IEC 62625-2	Electronic railway equipment - On board driving data recording system - Part 2: Conformity testing
EN 16586-1	Railway applications - Design for PRM use - Accessibility of persons with reduced mobility to rolling stock - Part 1: Steps for access and egress
SUBSET-034	Train Interface FIS
EN 17050	Conformity assessment - Supplier's declaration of conformity

Standard	Title
EN ISO 14040	Environmental management - Life cycle assessment - Principles and framework
EN 1559-1	Founding, Technical conditions of delivery
EN 1559-2	Founding – Technical conditions of delivery – Part 3: Additional requirements for steel castings
EN 1559-3	Founding. Technical conditions of delivery. Additional requirements for iron castings
EN 60721-3-5	Classification of environmental conditions- Part 3: Classification of groups of environmental parameters and their severities -Part 5: Ground vehicle installations
ISO 16281	Rolling bearings - Methods for calculating the modified reference rating life for universally loaded bearings
DIN 3990	Calculation of load capacity of cylindrical gears
DIN 743	Calculation of load capacity of shafts and axles
VDI 2230-1	Systematic calculation of highly stressed bolted joints – Joints with one cylindrical bolt
DVS 1612	Design and endurance strength analysis of steel welded joints in rail-vehicle construction
DIN 7190	Interference fits – Calculation and design rules
DIN 3962 (ISO1328)	Tolerances for cylindrical gear teeth
DIN 3963 (ISO1328)	Tolerances for cylindrical gear teeth – Tolerances for working deviations
ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories
EN 13913	Rubber Suspension Components – Elastomer-based mechanical parts
ISO 2230	Rubber products. Guidelines for storage.
EN ISO 286-1	ISO system of tolerance and coupling. Fundamental principles for tolerance, gaps and coupling.
EN 15437-2	Railway applications – Axlebox condition monitoring – Interface and design requirements – Part 2: Performance and design requirements of on-board systems for temperature monitoring
ISO 281	Rolling bearings – Dynamic load ratings and rating life
UIC 822	Technical specification for the supply of helical compression springs, hot or cold coiled for tractive and trailing stock.
EN ISO 2081	Metallic and other inorganic coatings – Electroplated coatings of zinc with supplementary treatments on iron or steel.
EN 13597	Railway application - Rubber Suspension Components - Rubber Diaphragms For Pneumatic Suspension Springs.
EN 14817	Control elements of the secondary suspension.
EN 13802	Railway applications. Suspension components. Hydraulic dampers
UIC 510-2	Trailing stock: wheels and wheelsets. Conditions concerning the use of various diameters
UIC 510-5	Technical approval of monobloc wheels – Application document for standard EN 13979-1
EN 10021	General technical delivery requirements for steel and iron products.
EN 10025-2	Hot rolled products of structural steels.
EN 10029	Specification for tolerances on dimensions, shape and mass for hot rolled steel plates 3 mm thick or above.
EN 10250-2	Open die steel forgings for general engineering purposes.
EN 10204	Metallic products - Types of inspection documents
EN 10160	Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method)
EN 10163-2	Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections - Part 2: Plate and wide flats
EN 7438	Metallic materials - Bend test
EN 10164	Steel products with improved deformation properties perpendicular to the surface of the product - Technical delivery conditions
ISO 148-1	Metallic materials -- Charpy pendulum impact test Test method
ISO 9712	Non-destructive testing - Qualification and certification of NDT personnel - General principles

Standard	Title
EN ISO 9692-1	Welding and allied processes - Recommendations for joint preparation - Part 1: Manual metal-arc welding, gas- shielded metal-arc welding, gas welding, TIG welding and beam welding of steels.
EN ISO 5817	Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections.
EN ISO 13920	General tolerances for welded constructions – Dimensions.
EN 15085-2	Railway applications - Welding of railway vehicles and components - Part 2: Quality requirements and certification of welding manufacturer
EN 8501-1	Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness - Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings
EN 9227	Corrosion tests in artificial atmospheres - Salt spray tests
EN 4628-2	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: Assessment of degree of blistering
EN 4628-3	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: Assessment of degree of rusting
EN 4628-4	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 4: Assessment of degree of cracking
EN 4628-5	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 5: Assessment of degree of flaking
EN 4628-6	Paints and varnishes - Evaluation of degradation of coatings-Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 6:Assessment of degree of chalking by tape method
EN 4628-8	Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 8: Assessment of degree of delamination and corrosion around a scribe
EN 2409	Paints and varnishes - Cross-cut test
EN 1520	Paints and varnishes - Cupping test
EN 6270-2	Paints and varnishes - Determination of resistance to humidity - Part 2: Condensation (in-cabinet exposure with heated water reservoir)
ASTM E446	Reference Radiograph for Steel Castings Up to 2 inch in Thickness
EN 444	Non-destructive testing - General principles for radiographic examination of metallic materials by X and gamma rays
EN 12681	Radiographic testing
EN 1369	Founding - Magnetic particle inspection
EN 1370	Founding - Examination of surface condition
EN 13018	Non-destructive testing - Visual testing - General principles
EN 10027-1	Designation system for steels - Part 1: steel names
EN 10204	Metallic Products – Types of Inspection Documents
EN 10293	Steel castings for general engineering uses
ISO 16810	Non-destructive testing - Ultrasonic testing - General principles
EN 12260-2	Founding - Ultrasonic examination - Part 2: Steel castings for highly stressed components
EN 1371-1	Founding - Liquid penetrant testing- Part 1: Sand, gravity die and low pressure die castings
ISO 3452-1	Non-destructive testing - Penetrant testing - Part 1: General principles
ISO 643	Steels - Micrographic determination of the apparent grain size
ISO 8062-3	Geometrical product specifications (GPS) – Dimensional and geometrical tolerances for moulded parts – Part 3: General dimensional and geometrical tolerances and machining allowances for casting.
ISO 6506-1	Metallic materials – Brinell hardness test – Part 1: Test method
ISO 6892-1	Metallic materials - Tensile testing - Part 1: Method of test at room temperature
ISO 8785	Surface imperfections - Terms, definitions and parameters

Standard	Title
ISO 9000	Quality management systems - basics and terms
ISO 9001: 2000	Quality Management Systems - Requirements
ISO 9934-1	Non-Destructive Testing - Magnetic Particle Testing - Part 1: General Principles
ISO14001	Environmental Management Systems

Table 1 – Reference Standards**END of THE DOCUMENT**