Annex No. (1)

Requirements of the Quality Management System

Quality Management System

ISO 9001 standard determines the requirements for a quality management system, including regulatory and procedural requirements of the scheme, and covers elements of quality and operation that will be applied to ensure the continuity of product quality and its compliance with product specifications and customer requirements. The scheme shall include the following requirements:

a. Senior Management Involvement

Evidence proving that there is an effective senior management involvement in the application, development, and continuous improvement to ensure effectiveness of quality management system must be found.

b. Records

Inspection, testing, and certification records must be kept for no less than ten (10) years as of the date of the last test of the production batch. Besides, the system of records must ensure traceability of each shipment to the original batch and each shipment to its specific order. Additionally, any concession granted by the purchaser or the concerned entity, must be traceable to a specific order.

c. Traceability

There must be a detailed procedure in place to ensure the traceability of the batch throughout the production process, including product storage, release and delivery to the customer.

d. Quality Control and Operations

1. The manufacturing company, or the agent appointed by the manufacturing company, must review the product requirements, which must include the manufacturing company's current scope of conformity. Besides, the manufacturer must determine and implement effective arrangements for communication with customers.
2. There must be a specific system for receiving raw materials for steel production, which should include an inspection to determine whether the materials contain acceptable low

levels of radioactivity. Besides, inspection records must be kept, along with the system used for the qualification and measurement of incoming raw materials, such as the chemical analysis of iron ores, if used. Sorting out and classification of scrap materials, including non-metallic content, carbon content, thickness, and dimensions, among other properties, must be conducted according to the procedures applicable in the factory.

3. There must be a documented system for controlling the variables in steel melting and refining. The system should include documented procedures for monitoring the quality of additives. Documented procedures must be in place for controlling the chemical composition to meet specification requirements. The system should also include testing certificates and/or relevant inspection documents for all elements intentionally added to the steel, which should include the casting process used, or continuous casting, with full control over production standards and acceptable chemical composition based on the type and quality of the manufactured billets.
4. There must be a documented procedure for the de-oxidation process in the crucible as required, as well as similar documented procedures to achieve the correct casting temperature and cooling rate. If micro-alloying is used, a documented procedure for controlling the addition of vanadium, among other materials, must exist to manage the grades of steel produced and the process of converting the cast steel into billets or alloys.
5. There must be a documented procedure for the casting sequence process, where the method for separating casts during the change of the cast must be described. The documented procedure must ensure traceability of the batch number, starting from the raw material stage, during operation, to the cooling, storage stages, and product release areas, as well as defining the separation of different casts during continuous production.
6. There must be documented procedures for inspecting and remedying defects in billets, addressing both internal and surface defects that could affect the subsequent production processes or the final product.
7. If the raw materials used in production, whether billets or semi-finished products, are internally produced at the factory, the materials used in rolling the rods must be traceable through records of chemical analysis and other tests as per material specifications, including tests for radioactive activity.

However, if the raw materials, billets, or semi-finished products are obtained from an external supplier, the exporter must possess a valid conformity certificate. The billets must be accompanied by a declaration of conformity to the relevant specifications and/or customer specifications, including the chemical composition of the billets and a radioactive activity test report. Besides, the production, inspection, and delivery of the billets must fulfil the requirements of this Annex, except for clauses (8) to (16).

8. If combining billets from more than one batch during a common rolling stage is required, this must be done under a documented procedure that determines the acceptable range for chemical composition.
9. The reheating process for raw materials that will be rolled must be documented. This must include a documented procedure for approaching the treatment of materials stuck in the furnace. Besides, the system must also include specific reheating cycles, combustion conditions, furnace temperatures, and pulling temperatures.
10. There must be a documented procedure for the rolling process that includes measuring the rolling temperature at the start and end of rolling, and the method for determining such degrees must be known. The procedure must also include a specific process for monitoring and recording dimensions and controlling shape, which should ensure that the product is suitable for further processing into concrete reinforcement. Besides, the procedure must include the rolling values specified for each grade and size, including stress levels, rolling speed, and final rolling temperature for each grade size.
11. The cooling processes for the final product must be fully documented. If the material requires a detailed metallurgical review, critical cooling rates must be measured and recorded. Additionally, a system must be established to monitor any cooling failures that may lead to non-conformity of the product, which might not be detected through routine mechanical tests.
12. With respect to cold working processes, there must be a documented procedure for controlling the cold working temperature, including monitoring and recording control of dimensions and shape during production.
13. Testing, inspection, and all relevant records must comply with product specifications and customer requirements. Specific methods for providing the required test information to

customers must exist. Product test information must be transmitted electronically to a cloud platform under the control of the concerned entity using the data transfer protocol provided by the concerned entity within (24) twenty-four hours as of the time the product is released to the customer.

14. There must be a documented procedure for approaching non-conforming materials, including isolation of such materials and appropriately labelling them.
15. There must be a documented system for product release ensuring that the materials fulfil customer specifications. This shall include handling and packaging of materials up to the final delivery point to the customer in order to ensure the quality during delivery. Additionally, this procedure must include the use of at least two durable ID tags attached to bundles or rolls in a manner that prevents loss of identification data during product handling. These tags must be durable and made of materials that facilitate the ready transfer of required identification data to the next stage, thereby maintaining product traceability.
16. The identification tags must include both a static QR code and a dynamic QR code according to the specifications outlined in Annex (4) attached to this Resolution.
17. A documented procedure must be in place for delivering materials directly to customers on behalf of the manufacturer or supplier. This procedure must ensure that the product fulfils the purchase order requirements, maintains operational identity for each shipment, and provides complete details for each consignment by the product manufacturer at the time of dispatch, as set in the materials order or customer specifications.

e. Efficiency and Training

The manufacturer must:

1. Determine the required efficiency for employees who perform tasks affecting product quality.
2. Provide training or take other procedures to meet these needs.
3. Assess effectiveness of procedures taken.
4. Ensure that their employees are aware of the relevance and importance of their activities and how they contribute to achieving quality objectives.

5. Keep appropriate records for education, training, skills and expertise.

f. Supervising the equipment and tools of monitoring and measurement

All calibration and testing equipment must be regularly maintained according to the specified maintenance program. Besides, calibration of the control equipment and tools in the production process, including laboratory equipment, must be in accordance with ISO 10012: Measurement management systems - Requirements for measurement processes and measuring equipment.

g. Improvement

The manufacturer must continuously improve the effectiveness of its quality management system by utilizing the quality policy, quality objectives, audit results, data analysis, remedy actions, and management reviews. Remedy actions must be documented and include procedures for dealing with customer complaints that relate to materials under the regulation. Besides, records of all received complaints and the actions taken must be kept, and any remedy action resulting from a complaint should include process adjustments and/or material retrieval if necessary.

h. Technical Service

There must be a system in place to provide technical support to customers with respect to the proper use and operation of the products.

I. Product Identification (Rolling Mark)

The rolling mark shall be agreed upon with the concerned entity. The concerned entity must keep a record of rolling marks issued to manufacturers. This mark must be repeated at intervals not exceeding 1.5 metres, and the rolling and marking requirements must comply with the approved standard specifications.

Annex No. (2)

Testing the Product

1. Internal product testing by the manufacturer

Chemical, mechanical, and dimensional properties of bars and coiled rods must comply with the requirements of the relevant rebar specification set forth in this Resolution, and the testing rate must at least fulfil the minimum rate specified in the relevant rebar specification.

The long-term quality levels for each measurement must also be determined in accordance with the method specified in BS 4449, ASTM A615 / 1615 or ASTM 706 / A706, or as per the requirements of the customer. Results should be compiled every three (3) months and reviewed by the concerned entity during audit and assessment processes. If less than 200 results are available for each diameter, the manufacturing establishment must use historical data to ensure at least 200 results are available. The concerned entity may also use data uploaded to the cloud storage system for assessing long-term quality levels.

2. Testing the product by the concerned entity

a. Product testing program

For each manufacturing process and each steel grade, the testing program must include Initial Type Tests (ITT) and subsequent inspections as outlined in Table No. (1). Besides, testing must comply with the relevant rebar specifications at the time of the initial tests. At least 50 tons of steel from each type must be available for sample selection for each diameter, with (10) ten samples, each at least 1.2 meters long, taken from each batch.

Table (1)

Repetition	Diameter	Inspection
3 samples per diameter of rods or coiled rods	Diameter range (Upper, middle and bottom)	Initial assessment (Preliminary Type Test)
3 samples per diameter of rods or coiled rods	One diameter	Periodic inspection

These samples must be tested according to Table No. (2). Testing should be conducted in a manner approved by the concerned entity, with at least 30% of the tests being witnessed by the assessors from the appointing entity.

Table (2)

The number of tests for each cast of the rebar/coil diameter.	Property under test
10	The cross-sectional area and mass per metre.
3 Unless there is a failure in the test, 2-3 additional samples from the same batch must be retested.	(Rm)
10	(Re)
10	Rm / Re
10	(Agt) BS 4449
10	Elongation after a break more than 8 inches or 200 mm
3	Yielding test and/or re-yielding
1	Surface calibration
1	Chemical composition
1	Macro (wherever applicable)

b. Duplicate Samples

A duplicate sample must be taken for examination by an approved laboratory for each test sample conducted at the factory as above-described. Tests may be increased in case there are any deviations or difficulties.

3. Assessment of Test results

a. Statistical Assessment

A statistical comparison must be conducted between the results of the product's final testing, the results of testing on duplicate samples, and the test results from independent laboratories for each testing program. The statistical comparison must consider the form of the product and the path of the production process.

b. Tensile testing (for reinforcement steel BS 4449 **only)**

Samples for tensile testing must be selected according to the requirements of the standard specification (BS 4449) for initial type testing and subsequent monitoring examinations as outlined in Table No. (3).

Table (3)

Repetition	Diameter	Inspection
Upon conducting the preliminary assessment	Diameter range (Upper, middle and bottom)	Initial assessment (Preliminary Type Test)
All measurements must be tested over a period of 5 years from the completion of the initial type test, and every 5 years thereafter.	One diameter	Periodic inspection

Sampling procedure must follow the standard specifications outlined in (BS 4449), and tensile testing must be conducted by an approved laboratory.

4. Performance of interconnection (for reinforcement steel BS 4449 only)

a. Performance through measurement

When the formation and structure of the deformations on rolled bars comply with the requirements of the standard specification (**BS 4449**) through surface calibration measurement, interconnection strength test is not required. Testing frequency must follow the guidelines specified in standard specification (**BS 4449**).

b. Performance through interconnection testing

Interconnection tests must be conducted on rolled rods where its surface geometry is not consistent with the requirements of standard specification (**BS 4449**).

Interconnection tests shall be conducted by an independent approved laboratory.

When using interconnection strength testing to confirm interconnection performance, the minimum dimensions of the deformations being tested must be recorded as part of the manufacturing and inspection procedures of the manufacturer. This should be verified through subsequent inspections by the concerned entity.

c. Sample Selection

All samples of the above-mentioned tests of the program must be selected by assessors of the concerned entity.

Annex No. (3)

Reference Standard Specifications

- (ISO 9001:2015) Quality Management Systems – Requirements.
- ISO 14001 Environmental Management Systems – Requirements with Guidance for Use.
- **BS 4449: 2005** + **A3:2016** Specifications for Steel Bars for the Reinforcement of Concrete – Weldable Reinforcing Steel – coiled bars and de-coiled– Specification.
- ASTM A615/A615M-20 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- ASTM A706 / A706-22 Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
- EN 10204: 2004 Metallic Products – Types of Inspection Documents
- EN 15804:2012 + A2:2019 Sustainability of Construction Works – Environmental Product Declarations.
- ISO 1461:2022 Hot-dip Galvanized Coatings on Iron and Steel Products. Standard Specifications and testing Methods.
- ISO 2178:2016 Non-magnetic Coatings on Magnetic Substrates – Measurement of Coating Thickness – Magnetic Method.
- ASTM E415-21 Standard Test Method for Analysis of Carbon and Low-Alloy Steel by Spark Emission Atomic Spectrometry.
- ISO 15630-1:2019 Steel for the reinforcement and pre-stressing of concrete — Test methods – Part 1: Reinforcing rods and wire.
- GSO ISO 6935-2:2022 Reinforcement for Concrete – Part Two: Ribbed Bars.

Annex No. (4)

Specifications for Static and Dynamic QR Codes

1. Static QR Code:

Static QR code must, at a minimum, provide secure access to the following data kept by the concerned entity:

a. Manufacturer.
b. The place of manufacturing the product.
c. Scope of the consent of the manufacturer.
d. Expiry date of the conformity certificate. Name and/or number of the concerned entity.

2. Dynamic QR Code:

Dynamic QR code must, at a minimum, provide secure access to the following data kept by the concerned entity:

a. Digital Product ID tag
b. Manufacturer.
c. The place of manufacturing the product.
d. The product standard specification and its issue date.
e. Grade of steel.
f. Nominal diameter of steel.
g. Batch number.
h. Product shape.
i. Chemical composition.
j. Mechanical properties.
k. ECAS Mark
l. Marks on the product. Name and/or number of the concerned entity.