MONITORING INSTRUCTION FOR COMPONENT INSPECTION	Issue No. 02 Rev. No. 04
	Date of Issue 12/04/10
ADAPTOR FORGING	**HAPP/QA/SC/ZD/002**

DRAWINGG NO. : HAPP DRAWING NO.O ADF 155 2 010 REV 8

RAW MATL SPECN. NO. : STEEL BAR AS PER SPECIFICATION.
BS 970 Pt.-I 1983 GR **709 M40**

CONDITION OF SUPPLY : AS FORGED, SHOT BLASTED & PROOF MACHINED

END USE : FOR ADAPTOR

A **INSPECTION CHECK TO BE CARRIED OUT AT FIRM'S PREMISES.**

(I) AT RAW MATERIAL STAGE.

SL. NO.	CHARACTERITICS	SPECIFICATION / REQUIREMENT	SAMPLE SIZE
1	CHEMICAL ANALYSIS (%)	CARBON - **0.36 to 0.44** MANGANESE - **0.70 to 1.00.** CHROMIUM - **0.90 to 1.20** MOLYBDENUM - **0.25 TO 0.35** OTHERS – AS APPLICABLE PER SPECIFICATION	1 SAMPLE / HEAT
2	ULTRASONIC TESTING	RAW MATERIAL IS ROLLED BAR AND SHALL BE ULTRASONICALLY INSPECTED TO USCO PROCEDURE 1261/0003.	100%
3	MECHANICAL TESTING	BARS SHALL BE CUT, FORGED AND HEAT TREATED TO OBTAIN MECHANICAL PROPERTIES IN ACCORDANCE WITH **CONDITION - V.** BS970 PART 1, 1983. UTS - 1000 TO 1150 N/MM^2 0.2 % PROOF STRESS - 835 N/MM^2 MIN. YIELD STRENGTH - 850 N/MM^2 MIN. % ELONGATION – 12 MIN. IMPACT TEST - 42 J MIN. HARDNESS – 239 TO 352 HB / 32-37 HRC	2 SAMPLE / HEAT.

Note :

1. **Raw material Sample will be selected from the bulk by HAPP rep./ Inspector at Firm's premises for the characteristics mentioned at Sl. No. 1 TO 3.**
2. **Raw material test certificate (physical, chemical, mechanical, ultrasonic etc.) from manufacturer co-relating purchase order of the firm clearly indicating Quantity, Heat No., color code, ultrasonic test details to be submitted by the firm.**
3. **On obtaining raw material clearance from HAPP, the firm should under take manufacture of forging.**

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II) FORGING STAGE (INSPECTION AT MANUFACTURER'S END)

SL. NO.	CHARACTERITICS	SPECIFICATION / REQUIREMENT	SAMPLE SIZE
1	VISUAL	THE FORGING SHOULD BE FREE FROM CRACKS, FLAWS, RUST, SCALING, MIS MATCH, SURFACE DEFECTS , PIT MARKS (ON SPECIFIC AREA(X) IN DRG.) AND OTHER INJURIOUS FORGING DEFECTS.	100 %
2	DIMENSIONS AND EST. MASS	AS PER DRAWING.	DEF 131
3	MARKING OF LOT NUMBER	MANUFACTURER'S LOT NUMBER TO BE MARKED (PUNCHED OR WITH PERMENANT MARKER) IN EVERY HEAT TREATMENT LOT.	EVERY HEAT
4	MAGNAFLUX CRACK DETECTION	FORGINGS SHALL THEN BE 100% MAGNAFLUX FOR CRACK DETECTION AT FORGING MANUFACTURER. NO CRACK / FLAW SHALL BE ACCEPTABLE.	100 %
5	MECHANICAL TESTING	BARS SHALL BE CUT, FORGED AND HEAT TREATED TO OBTAIN MECHANICAL PROPERTIES IN ACCORDANCE WITH CONDITION - V. BS 970 PART 1, 1983. UTS – 1000 TO 1150 N/MM^2 0.2 % PROOF STRESS - 835 N/MM^2 MIN. YIELD STRENGTH - 850 N/MM^2 MIN. % ELONGATION – 12 MIN. IMPACT TEST (CHARPY) - 42 J MIN.	2 SAMPLE / HEAT.
6	HARDNESS	HARDNESS OF EACH FORGING SHALL BE TESTED AT MANUFACTURER END. THE FORGING SHALL BE MARKED FOR SL. NO. & HARDNESS VALUE WITH PERMENANT MARKER. HARDNESS : 32 – 35 HRC	100 %

Note :

1. **Firm should supply forgings with all Inspection reports as mentioned below.**

a) **Dimensional report & estimated mass report.**
b) **Hardness Test report for 100 %.**
c) **Mechanical Test report.**
d) **Magna flux test report for 100 %.**

2. **Raw material test certificates (physical, chemical, mechanical, ultrasonic etc.) from manufacturer, co-relating purchase order of the firm clearly indicating Quantity, Heat No., color code, ultrasonic test details to be submitted by the firm along with each supply. ALL TEST REPORTS / CERTIFICATES MUST BE COUNTER SIGNED BY FIRM'S HEAD OF QUALITY AND SHOULD HAVE LINK TO HAPP SUPPLY ORDER NO. AND QTY. IN EACH CASE.**

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B **INSPECTION CHECK TO BE CARRIED OUT ON RECEIPT AT FACTORY.**

SL. NO.	CHARACTERITICS	SPECIFICATION / REQUIREMENT	SAMPLE SIZE
1	VISUAL	THE FORGING SHOULD BE FREE FROM CRACKS, FLAWS, RUST, SCALING, MIS MATCH, SURFACE DEFECTS , PIT MARKS (ON SPECIFIC AREA(X) IN DRG.) AND OTHER INJURIOUS FORGING DEFECTS.	100 %
2	PACKING	EACH SUPPLY SHOULD BE ACCOMPANIED WITH PACKING SLIP / TAG INDICATING LOT NO. QTY, SUPPLIER CODE, SUPPLY ORDER NO. ETC.	EACH CONSIGNMENT
3	DIMENSIONS, EST. MASS & MARKING	**AS PER DRAWING**	DEF 131
4	CHEMICAL ANALYSIS(%)	CARBON - **0.36 to 0.44** MANGANESE - **0.70 to 1.00.** CHROMIUM - **0.90 to 1.20** MOLYBDENUM - **0.25 TO 0.35** OTHERS – AS APPLICABLE PER SPECIFICATION	1 SAMPLE / HEAT
5	MECHANICAL TESTING	ON RECEIPT 1 FORGING SHALL BE SELECTED AT RANDOM FROM EACH FORGING/HEAT TREATMENT LOT AND SUBJECTED TO MECHANICAL TESTING TO OBTAIN MECHANICAL PROPERTIES UTS – 1000 TO 1150 N/MM^2 0.2 % PROOF STRESS – 835 N/MM^2 MIN. YIELD STRENGTH - 850 N/MM^2 MIN. % ELONGATION – 12 MIN. IMPACT TEST (CHARPY) - 42 J MIN.	2 SAMPLE / HEAT.
6	HARDNESS	HARDNESS OF EACH FORGING SHALL BE TESTED AT MANUFACTURER END. THE FORGING SHALL BE MARKED FOR SL. NO. & HARDNESS VALUE WITH PERMENANT MARKER. HARDNESS : 32 – 35 HRC	100 %
7	MAGNAFLUX CRACK DETECTION	FORGINGS SHALL THEN BE SUBJECTED TO MAGNAFLUX TEST FOR CRACK DETECTION. NO CRACK / FLAW SHALL BE ACCEPTABLE.	5 %

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C. **VERIFICATION OF INSPECTION DOCUMENTS.**

FOLLOWING INSPECTION DOCUMENTS MUST BE ENCLOSED ALONG WITH EACH SUPPLY OF RAW MATERIAL.

SL. NO.	INSPECTION DOCUMENTS
1	TEST CERTIFICATES FOR PHYSICAL, CHEMICAL , MECHANICAL. ULTRASONIC, HARDNESS AND 100% MAGNAFLUX CRACK DETECTION REPORT FROM **NABL ACCREDITED LAB OR GOVT. APPROVED LABORATORY.**
2	PACKING SLIP DETAILS (INDICATING SUPPLY ORDER, LOT NO. , QTY. & H/T CONDITION)
3	DIMENSIONAL INSPECTION REPORT FROM SUPPLIER.
4	GAURANTEE / WARRANTY CERTIFICATE,

ALL TEST REPORTS / CERTIFICATES MUST BE COUNTER SIGNED BY FIRM'S HEAD OF QUALITY AND SHOULD HAVE LINK TO HAPP SUPPLY ORDER NO. AND QTY. IN EACH CASE.

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