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Visual Welding Inspector (WI) - 2025

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Question: 1313

If a welding symbol indicates a "bevel" with a specified angle of 45 degrees and a depth of 8 mm, what is the minimum base metal thickness required to ensure proper welding?

A. 14 mm
B. 10 mm
C. 12 mm
D. 16 mm

Answer: D

Explanation: A bevel weld at a 45-degree angle typically requires the base metal to be at least twice the depth of the bevel to ensure adequate support, hence a minimum of 16 mm.

Question: 1314

In a scenario where a crack is identified in a weld, how does the type of crack (hot, cold, or crater) affect the choice of repair method, particularly in terms of temperature considerations?

A. Crater cracks need to be ground out before repair
B. Cold cracks can be repaired without preheating
C. Hot cracks require immediate cooling
D. All types need the same repair method

Answer: A

Explanation: Crater cracks typically need to be ground out and repaired carefully to avoid further weakening the joint, as they can propagate easily if not addressed properly.

Question: 1315
A fillet weld throat is specified as 7 mm, but inspection with a gauge measures 5.5 mm. BS EN 970 Level C allows a reduction of 0.1t (max 1 mm), where t = 7 mm. Is this acceptable?

A. Yes, within tolerance
B. No, exceeds reduction limit
C. No, requires re-welding
D. Yes, if leg lengths are met

Answer: B

Explanation: For Level C, reduction ≤ 0.1t or 1 mm, whichever is less (0.1 × 7 = 0.7 mm). The 1.5 mm reduction (7 - 5.5 = 1.5 mm) exceeds 0.7 mm, making it unacceptable.

Question: 1316

A welding inspector is tasked with visually assessing a T-joint weld on a heavy machinery component under ISO 17637, where the fillet weld throat thickness measures 5.8 mm against a specified minimum of 6 mm. Considering the inspector's responsibility, what action aligns with maintaining quality standards?

A. Instruct the welder to add an additional pass to increase the throat thickness
B. Accept the weld as the deviation is within a 10% tolerance of the specified value
C. Use a fillet weld gauge to confirm the measurement and report the shortfall to the welding supervisor
D. Recalibrate the gauge and remeasure to account for potential tool error

Answer: C

Explanation: ISO 17637 requires inspectors to accurately measure and report deviations from specified dimensions, such as a throat thickness below 6 mm, using tools like a fillet weld gauge. Reporting to the supervisor ensures proper quality control action, whereas accepting deviations, directing repairs, or assuming tool error without evidence contravenes the inspector's defined responsibilities.

Question: 1317

A drawing per ISO 2553 specifies a K-joint with a welding symbol: a double-bevel groove weld with s10 on both sides, a 3 mm root face, and a "weld all around" symbol. The brace is 20 mm thick, and the chord is 25 mm thick. What is the minimum throat thickness per side?

A. 20 mm
B. 10 mm
C. 3 mm
D. 25 mm

Answer: B

Explanation: In ISO 2553, "s10" specifies a 10 mm throat thickness for each side of the double-bevel groove weld in the K-joint. This is the minimum required weld size per side, independent of the brace or chord thickness.

Question: 1318

A welding inspector is overseeing a confidential aerospace weld using Plasma Arc Welding (PAW) at 280A. The welder logs detailed process data (e.g., pulse frequency of 120 Hz, peak current 300A) on an unsecured laptop accessible to non-cleared staff. Per ISO 27001 Annex A controls, what should the inspector mandate?A. Encrypt the laptop and restrict access
B. Delete the data and use paper records
C. Transfer data to a secure server immediately
D. Allow logging but limit staff proximity

Answer: A

Explanation: ISO 27001 Annex A requires protection of sensitive data against unauthorized access. An unsecured laptop violates confidentiality, risking exposure of critical PAW parameters. Encryption and access restriction provide immediate, robust security, surpassing deletion or server transfer, which may delay or disrupt workflow.

Question: 1319

In assessing a weld for spatter, what specific surface condition is indicative of excessive spatter that may require corrective action?

A. Smooth and shiny surface
B. Minimal discoloration
C. Uniform bead appearance
D. Rough surface with visible droplets

Answer: D

Explanation: A rough surface with visible droplets indicates excessive spatter, which can affect the aesthetics and potentially the integrity of the weld, requiring corrective action.

Question: 1320

While inspecting a Welder Performance Qualification (WPQ) test coupon for a 6G position pipe weld (45° inclined) using Gas Metal Arc Welding (GMAW), you observe that the welder used a short-circuiting transfer mode with a 1.2 mm ER70S-6 filler wire. The test coupon passed visual inspection and radiographic testing per ASME Section IX, QW-302. However, the WPQ documentation indicates qualification for all positions, including vertical down. Is this qualification acceptable based on the test conditions?

A. Yes, the 6G position qualifies all positions including vertical down
B. No, vertical down requires a separate qualification test
C. Yes, provided the WPS allows short-circuiting transfer mode
D. No, GMAW short-circuiting mode disqualifies vertical down welding

Answer: B

Explanation: ASME Section IX (QW-405.3) states that qualification in the 6G position qualifies all positions except vertical down, which requires a separate test due to its unique welding characteristics. The use of short-circuiting transfer mode does not inherently disqualify the test, but the vertical down position still needs distinct qualification.

Question: 1321

In the classification of welding consumables, which of the following designations indicates a low hydrogen electrode?

A. E6010
B. E6013
C. E7018
D. E7016

Answer: C

Explanation: The E7018 electrode is classified as a low hydrogen electrode, suitable for critical applications.

Question: 1322

In an SMAW fillet weld on a 10 mm thick carbon steel T-joint, you measure the leg length using a steel ruler with 0.5 mm graduations under 1000 lux illumination. The WPS specifies a leg length of 8 mm ±1 mm, and you measure 6.5 mm over a 15 mm length. BS EN ISO 5817 Level C requires WPS compliance. What is the correct reporting action?

A. Report: "Leg length: 6.5 mm, minor deviation, acceptable"
B. Report: "Leg length: 6.5 mm, meets Level C standards"
C. Report: "Leg length: 6.5 mm, within ruler tolerance"
D. Report: "Leg length: 6.5 mm, below WPS minimum, reject"

Answer: D

Explanation: The 6.5 mm leg length falls below the 7 mm minimum (8 mm - 1 mm) specified by the WPS, which BS EN ISO 5817 Level C mandates compliance with, making it a defect requiring rejection. The steel ruler measurement is accurate, and the report must reflect the shortfall, not a tolerance or standard compliance.

Question: 1323

While monitoring the welding of a fillet weld on a 12 mm thick structural component per ISO 17637, a welding inspector notes that the welder is operating at 28 V and 250 A, yielding a heat input of 1.9 kJ/mm, exceeding the WPS maximum of 1.5 kJ/mm for a travel speed of 4 mm/s. What is the inspector's duty at this stage?

A. Allow welding to proceed as the exceedance is within a 30% tolerance
B. Interrupt welding and document the heat input exceedance for quality assessment
C. Adjust the voltage to 24 V to bring heat input within limits
D. Recalculate the travel speed to align with the WPS heat input limit

Answer: B

Explanation: ISO 17637 mandates monitoring welding parameters during the process. A heat input of 1.9 kJ/mm exceeds the WPS limit of 1.5 kJ/mm, requiring the inspector to stop welding and report for quality control, not continue, adjust settings, or recalculate independently.

Question: 1324

A 15 mm thick single V-butt weld (40° bevel) has a root gap of 3 mm and root face of 2 mm. Visual inspection shows a 4 mm protrusion beyond the root. What is this?

A. Incomplete penetration
B. Lack of fusion
C. Root concavity
D. Excess penetration

Answer: D

Explanation: A protrusion beyond the root indicates excess penetration, where weld metal extends past the root face due to a large root gap (3 mm) and thin root face (2 mm). Incomplete penetration lacks fusion depth, root concavity depresses inward, and lack of fusion shows no bonding.

Question: 1325

When interpreting a welding symbol that specifies a "U" shaped groove, what is the primary characteristic of this joint type?

A. It is designed for better penetration
B. It has a uniform depth
C. It requires a backing bar
D. It is used for butt joints only

Answer: A

Explanation: A "U" shaped groove is designed to provide better penetration for the weld metal, enhancing the strength of the joint.

Question: 1326

When welding with GTAW on magnesium alloys, what shielding gas mixture is typically recommended to achieve optimal results?

A. Argon only
B. Argon with a small percentage of helium
C. Helium only
D. Nitrogen with argon

Answer: B

Explanation: A mixture of argon with a small percentage of helium enhances arc stability and improves penetration when welding magnesium alloys.

Question: 1327

If a welding inspector observes that safety barriers are not appropriately placed around welding operations, what is the immediate risk this poses?

A. Increased visibility for passersby
B. Enhanced communication among workers
C. Improved airflow around the workspace
D. Potential for unauthorized access and accidents

Answer: D

Explanation: Improper placement of safety barriers increases the risk of unauthorized access to hazardous areas, leading to potential accidents and injuries.

Question: 1328
A WPS for FCAW on a 30 mm thick plate specifies a wire feed speed of 200–250 mm/min and a contact tip-to-work distance (CTWD) of 15–20 mm. A welder uses 260 mm/min and 25 mm CTWD. Per ASME Section IX, is requalification required?

A. Yes, only the CTWD change is significant
B. No, the changes are within acceptable tolerances
C. Yes, both wire feed speed and CTWD are essential variables
D. No, if the weld quality meets standards

Answer: C

Explanation: ASME Section IX, QW-404.22 (wire feed speed) and QW-409.9 (CTWD), classify these as essential variables for FCAW, affecting deposition and heat input. Deviations beyond the specified ranges necessitate requalification.

Question: 1329

During a visual inspection of an FCAW butt weld on a 50 mm thick carbon steel plate, you use a fillet weld gauge to measure the throat thickness under 500 lux lighting. The WPS requires a minimum throat of 25 mm, and you record a value of 24.5 mm over a 30 mm length at a 30° angle. AWS D1.1 Table 6.1 requires WPS compliance for static loading. What is the reporting format?

A. Report: "Throat thickness: 24.5 mm, below WPS minimum, reject"
B. Report: "Throat thickness: 24.5 mm, minor deviation, acceptable"
C. Report: "Throat thickness: 24.5 mm, within gauge tolerance"
D. Report: "Throat thickness: 24.5 mm, meets AWS standards"

Answer: A

Explanation: The 24.5 mm throat thickness is below the 25 mm WPS minimum required by AWS D1.1 Table 6.1 for static loading, making it a defect requiring rejection. The fillet weld gauge measurement is precise, and the report must reflect the shortfall against the WPS, not a tolerance or standard compliance.

Question: 1330

Which of the following welding processes is most suitable for joining dissimilar metals?

A. FCAW
B. SMAW
C. GTAW
D. SAW

Answer: C

Explanation: Gas Tungsten Arc Welding (GTAW) provides precise control and is ideal for dissimilar metal welding applications.

Question: 1331

In assessing workmanship standards, which specific practice can significantly reduce the likelihood of defects in welded joints?

A. Using a single welding technique
B. Ignoring minor imperfections
C. Regularly training and certifying welders
D. Reducing inspection frequency

Answer: C

Explanation: Regularly training and certifying welders can significantly reduce the likelihood of defects in welded joints, ensuring high-quality workmanship and compliance with standards.

Question: 1332

While overseeing the welding of a butt weld on a 15 mm thick plate per ISO 17637, a welding inspector measures a preheat temperature of 80°C, below the WPS minimum of 100°C, using an infrared pyrometer, with welding already underway. What should the inspector do?

A. Allow welding to continue as the difference is within 20°C tolerance
B. Stop welding and report the temperature shortfall to the welding coordinator
C. Increase the preheat to 100°C using a torch and resume welding
D. Recheck the pyrometer calibration to confirm the reading

Answer: B

Explanation: During welding, ISO 17637 requires adherence to WPS preheat minimums (100°C). A reading of 80°C necessitates stopping welding and reporting for quality control, not continuing, adjusting

heat, or rechecking without action.

Question: 1333

In a visual inspection of a weld, you find evidence of lamellar tearing. What is the primary material property that helps mitigate this defect?

A. Ductility
B. Hardness
C. Tensile strength
D. Yield strength

Answer: A

Explanation: High ductility in the base metal can help mitigate the risk of lamellar tearing during welding.

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