10. Chemical Analysis

10.1 A sample of the solid electrode or rod stock from which it is made shall be prepared for chemical analysis. Solid filler metal, when analyzed for elements that are present in a coating (copper flashing, for example), shall be analyzed without removing the coating. When the filler metal is analyzed for elements other than those in the coating, the coating shall be removed if its presence affects the results of the analysis for the other elements. Rod stock analyzed for elements not in the coating may be analyzed prior to reducing the rod to finished electrode diameter and applying the coating.

10.2 For composite (stranded or metal cored) filler metals, the sample for analysis shall be taken from weld metal produced with the filler metal and shielding gas with which it is classified.

The sample shall be taken from a weld pad prepared in accordance with Clause 9.3 or from the reduced section of the fractured tension test specimen, or from a corresponding location or any location above it along the weld centerline in the groove weld in Figure 2. In case of dispute, *the area of the groove weld described in Clause 9.1 (including the tension specimen) is the referee method.*

The top surface of the pad described in Clause 9.3 and shown in Figure 4 shall be removed and discarded. A sample for analysis shall be obtained from the underlying metal, no closer than 3/8 in [9.5 mm] above the surface of the base metal in Figure 4 by any means that will not affect the chemical composition. The sample shall be free of slag.

When the sample is taken from the groove weld or the reduced section of the fractured tension test specimen, that material shall be prepared for analysis by any means that will not affect the chemical composition.

10.3 The sample obtained as specified in Clauses 10.1 or 10.2 shall be analyzed by accepted analytical methods. The referee method shall be ASTM E350.

10.4 The results of the analysis shall meet the requirements of Table 1 for solid electrodes or Table 2 for composite electrodes for the classification of electrode under test.

Table 5A — Welding conditions

Diameter	Welding current	Welding voltage	Contact tube distance
mm	A	V	mm
1,2	280 ± 20	[a]	20 ± 3

[a] The welding voltage depends on the choice of shielding gas.

Table 5B — Welding conditions

Diameter	Welding current	Welding voltage	Contact tube distance
mm	A	V	mm
1,2	290 ± 30	[a]	20 ± 3

[a] The welding voltage depends on the choice of shielding gas.

Table 6A — Pass sequence

Electrode diameter	Split weave		
mm	Layer No.	Passes per layer	Number of layers
1,2	1 to top	2[a]	6 to 10

[a] The top two layers may be completed with three passes per layer.

Table 6B — Pass sequence

Electrode diameter mm	Layer No.	Passes per layer	Number of layers
1,2	1 to top	2 or 3	6 to 10

6.3 Post-weld heat-treated (PWHT) condition

6.3A Classification by yield strength and 47 J impact energy

No PWHT condition is used in this document.

6.3B Classification by tensile strength and 27 J impact energy

Test assemblies made with wire electrodes classified in the PWHT condition shall be heat treated at 620 °C ± 15 °C for $60(^{+15}_{0})$ min. The furnace shall be at a temperature not higher than 315 °C when the test assembly is placed in it. The heating rate, from that point to the 620 °C ± 15 °C holding temperature, shall not exceed 220 °C/h. When the holding time has been completed, the assembly shall be allowed to cool in the furnace to a temperature below 315 °C at a rate not exceeding 195 °C/h. The assembly may be removed from the furnace at any temperature below 315 °C and allowed to cool in still air to room temperature.

7 Chemical analysis

Chemical analysis shall be performed on specimens of the wire. Any analytical technique may be used, but in case of dispute, reference shall be made to established published methods.

In the case of chemical elements which do not change during production, chemical analysis of the wire may be substituted by an analysis of product in process or raw material or a report of the ladle chemical analysis of a raw material.

7A Classification by yield strength and 47 J impact energy

The results of the chemical analysis shall fulfil the requirements given in Table 3A for the classification under test.

7B Classification by tensile strength and 27 J impact energy

The results of the chemical analysis shall fulfil the requirements given in Table 3B for the classification under test.