ND-4622 PWHT Time and Temperature Requirements
ND-4622.1 General Requirements. Except as otherwise permitted in ND-4622.7, all welds, including repair welds, shall be postweld heat treated. During postweld heat treatment, the metal temperature shall be maintained within the temperature range and for the minimum holding time specified in Table ND-4622.1-1, except as otherwise permitted in ND-4622.4(d). For P-No. 11A, Group 1 material, the complete component shall be postweld heat treated within the temperature range specified in Table ND-4622.1-1 and the provisions of ND-4624.2 and ND-4624.3 shall not be applied. P-Number groups in Table ND-4622.1-1 are in accordance with Section IX, QW-420. Except as provided in ND-4624.3, PWHT shall be performed in temperature-surveyed and -calibrated furnaces, or PWHT shall be performed with thermocouples in contact with the material or attached to blocks in contact with the material. In addition, the requirements of the following subparagraphs shall apply.

THE FOLLOWING FOR INFORMATION

ND-4622.4 Holding Times at Temperature.
(a) The holding time at temperature as specified in Table ND-4622.1-1 shall be based on the nominal thickness of the weld. The holding time need not be continuous. It may be an accumulation of the times of multiple postweld heat treat cycles.
(b) Holding time at temperature in excess of the minimum requirements of Table ND-4622.1-1 may be used, provided that specimens so heat treated are tested in accordance with ND-2200, ND-2400, and ND-4300.
(c) Alternatively, when it is impractical to postweld heat treat at the temperature range specified in Table ND-4622.1-1, it is permissible to perform the postweld heat treatment of certain materials at lower temperatures for longer periods of time in accordance with Table ND-4622.4(c)-1 and (1), (2), and (3) below.
(1) Except for P-No. 1 materials, when welds in the materials listed in Table ND-4622.4(c)-1 are to be postweld heat treated at these lower minimum temperatures, the impact test specimens for the welding procedure qualification required by ND-4300 shall be made using the same minimum temperatures and increased minimum holding time. Welding procedures, qualified at the temperature range and minimum holding time specified in Table ND-4622.1-1 and at the lower minimum temperature and increased minimum holding time permitted by Table ND-4622.4(c)-1, are also qualified for any temperature in between. When such an in-between temperature is used, the minimum holding time shall be interpolated from Table ND-4622.1-1 and the alternative requirements.
of Table ND-4622.4(c)-1.
(2) Except for P-No. 1 materials, when welds in the
materials listed in Table ND-4622.4(c)-1 are to be postweld
heat treated at these lower minimum temperatures,
the welding material certification required by ND-2400
shall be made using the same minimum temperature
and increased minimum holding times. Welding material
certified at the temperature range and minimum holding
time specified in Table ND-4622.1-1 and at the lower minimum
temperatures and increased minimum holding times
permitted by Table ND-4622.4(c)-1 are also certified for
any temperature in between.
(3) Base material certified in accordance with
ND-2200 may be postweld heat treated at the lower minimum
temperatures and increased minimum holding times
without recertification. Postweld heat treatment at these
lower minimum temperatures and increased minimum
holding times may also be the tempering operation, provided
a higher tempering temperature is not required by
the material specification.

ND-4622.5 PWHT Requirements When Different
P-Number Materials Are Joined.

When pressure retaining materials of two different P-Number groups are joined by
welding, the applicable postweld heat treatment shall be
that specified in Table ND-4622.1-1 for the material requiring
the higher PWHT temperature range.