BOMBARDIER
Toronto Site
PROPRIETARY INFORMATION

PPS 30.27

PRODUCTION PROCESS STANDARD

ANNEALING COPPER TUBING

Issue 4
- This standard supersedes PPS 30.27, Issue 3.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS related questions to christie.chung@aero.bombardier.com or (416) 375-7641.
- This PPS is effective as of the distribution date.

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	Quality	

TABLE OF CONTENTS

Sections **Page**

1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure for annealing and strain relieving copper tubing which has been work hardened.

1.1.1 This PPS complements the engineering drawings that specify its use as an authorized instruction. The procedure specified in this PPS shall be followed to ensure compliance with all applicable specifications. In general, if this PPS conflicts with the engineering drawing, follow the engineering drawing. The requirements specified in this PPS are necessary to fulfil the engineering design and reliability objectives.

1.1.2 Refer to PPS 13.26 for the subcontractor provisions applicable to this PPS.

1.1.3 Procedure or requirements specified in a Bombardier BAPS, MPS, LES or P. Spec. do not supersede the procedure or requirements specified in this PPS. Similarly, the procedure and requirements specified in this PPS are not applicable when use of a BAPS, MPS, LES or P. Spec. is specified.

2 HAZARDOUS MATERIALS

2.1 Before receipt at Bombardier Toronto, all materials shall be approved and assigned Material Safety Data Sheet (MSDS) numbers by the Bombardier Toronto Environment, Health and Safety Department. Refer to the manufacturer's MSDS for specific safety data on any of the materials specified in this PPS. If the MSDS is not available, contact the Bombardier Toronto Environment, Health and Safety Department.

3 REFERENCES

3.1 PPS 13.26 - General Subcontractor Provisions.

3.2 PPS 31.06 - The Cleaning of Copper and Copper Alloys.

4 EQUIPMENT

4.1 Use only controlled atmosphere furnaces for heating copper tubing. The furnace atmosphere shall be neutral or slightly oxidizing. The use of a reducing atmosphere is prohibited.

5 PROCEDURE

5.1 Cleaning

5.1.1 Before annealing or strain relieving, clean all copper tubing according to PPS 31.06 to remove oil, grease and other contamination. Ensure parts are free of entrapped cleaning fluid before placing in furnace.

5.2 Annealing

5.2.1 Perform annealing of copper tubing as follows:

Step 1. Insert cleaned parts into a furnace operating at 900°F to 1300°F and soak only long enough for the copper to reach furnace temperature.

Step 2. Withdraw and immediately quench in cold water.

5.3 Strain Relieving

5.3.1 Strain relieve as follows:

Step 1. Insert cleaned parts into a furnace operating at 400°F to 600°F and soak only long enough for the copper to reach the furnace temperature.

Step 2. Withdraw and immediately quench in cold water.

5.4 Post Cleaning

5.4.1 After quenching and if required, re-clean parts according to PPS 31.06.

6 REQUIREMENTS

6.1 Ensure parts are processed according to the engineering drawing and as specified herein.

7 SAFETY PRECAUTIONS

7.1 Safety precautions applicable to the materials and procedures specified herein shall be defined by the subcontractor performing the work for Bombardier Toronto.

8 PERSONNEL REQUIREMENTS

8.1 Personnel responsible for annealing copper tubing shall have a good working knowledge of the applicable procedure and requirements as specified herein and shall have exhibited their competency to their supervisor.