

WASC 2198 ●

Diagram  
of Manufacturing  
Process for  
American  
Solventless Process  
for Rocket  
Composition JPN

WASC 2198-00

Subject:

Diagrammatic Representation  
of  
American Manufacturing Process  
for  
Extruded Double Base Propellant

Date:

1945

Diagram Title:

The Solventless Cordite Process for American Rocket  
Composition

10 BAGS EACH CONTAINING 30½ LB DRY WEIGHT OF N/C MADE UP TO A PULP WITH 350 GALLONS N/C BACK WATER IN A TINNED COPPER TANK DIAM. 5 FT DEPTH 4½ FT.

N/C SLURRY STIRRED FOR 10 MINS AT A STIRRER SPEED OF 100 RPM. BEFORE PUMPING ROUND THE TUNDISH.

DIETHYL PHTHALATE WEIGHED OUT IN CHARGES OF 38 LB 4 OZ INTO ALUMINUM DELIVERY VESSEL.

TUNDISH A TINNED VESSEL 2' 6" DIAM 6" IN HT. WITH TANGENTIAL OUTLET & SPIRAL UPSTAND. THE SLURRY MAKES 3 CIRCUITS.

NITROGLYCERINE BURETTE DELIVERS 259 LB N/C INTO THE N/C PULP AS IT CIRCULATES IN THE TUNDISH THROUGH A ROSE SPRAY.

HORIZONTAL PRESS STEEL WATER JACKETED PRESS CYLINDER HEATED TO 72°C. CHARGE TEMP 40-50°C. PLUNGER SPEED DURING EXTRUSION 3.75"/MIN. CHARGE EXTRUDED AT 26"/MIN. THE EXTRUSION IS CUT HOT INTO LENGTHS OF 40½" ON A PNEUMATIC GUILLOTINE.

PRESS DIE 4" 04" CRUCIFORM DUSH.

AFTER 48 HRS COOLING THE STICKS ARE TRIMMED ON MILLING CUTTERS TO A WEIGHT OF 24 LB ± 8 OZS & FINISHED LENGTH OF 39-39½"

PRESS CHARGE 108 LB FOR 15" PRESS 60 LB FOR 10½" PRESS.

CARBAMITE 12 LB CANDELILLA WAX & CARBON BLACK 2 LB 6 OZ ADDED AFTER THE DIETHYL PHTHALATE ASA SLURRY WITH 5 GALL WATER.

ROLLING MILL 12" DIAM ROLLS 24" WIDE. SURFACE TEMP OF ROLLS 45-55°C. PERIPHERAL SPEED 26 FT/MIN.

TRIMMED STICKS READY FOR INSPECTION & ISSUE.

AFTER CIRCULATION OF COMPLETE DOUBLE MIX ROUND THE TUNDISH THE DIETHYL PHTHALATE IS INJECTED INTO THE MIXING TANK BY STEAM AT A PRESSURE OF 50 LB/SQ IN.

MIXING TANK 6' 6" DIAM 5' 5" DEEP OF TINNED COPPER WITH CONICAL STIRRER. STIRRER SPEED 79 RPM.

100 MESH POTASSIUM SULPHATE IS PASSED THROUGH A 20 MESH SIEVE AND ADDED TO A MEASURED AMOUNT OF WATER IN A CALIBRATED ALUMINUM TANK TO GIVE A 10.1% SOLUTION. THE TANK IS FITTED WITH A STEAM COIL AND AIR AGITATION TO AID SOLUTION. AFTER ADJUSTMENT SOL<sup>n</sup> IS RUN TO A SMALLER DELIVERY TANK AS REQUIRED.

21 LB PASTE & REWORK ROLLED AT THE ONE TIME.

FULLY COLLOIDED SHEET CUT INTO STRIPS WHICH ARE ROLLED UP ROUND SOLID CORES PREVIOUSLY PRESSED FROM THE SAME MATERIAL. THESE ROLLS ARE MADE OF A SUITABLE SIZE FOR THE PRESS CYLINDER.

PASTE SLURRY STIRRED 30 MINS. AFTER ADDITION OF CARBAMITE THEN PUMPED TO THE SHEETING TABLE.

HOT AIR CURRENT AT 2060 CU FT/MIN AND TEMP 45-50°C.

SPRAY CAN FILLED LEVEL FULL FROM SMALL ALUMINUM STORAGE TANK & EMPTIED OVER EACH SHEET.

**THE SOLVENTLESS CORDITE PROCESS FOR AMERICAN ROCKET COMPOSITION.**  
J.F.N.  
THE PROCESS IS DETAILED FOR THE TUNDISH METHOD OF WET MIXING WITHOUT THE USE OF THE RING-MAIN SYSTEM.

**SHEETING TABLE**  
REEL CLOTH BAND MOVING AT 6 FT/MIN OVER ROLLERS & VACUUM SHOES. FILTERING PASTE EMERGING FROM THE COUCH ROLLER IS CUT BY A ROTARY KNIFE INTO SHEETS OF 10 TO 12 LBS DRY WEIGHT, CONTAINING 20-24% MOISTURE.

EACH PASTE SHEET LEAVING THE TABLE IS SPRAYED WITH 1.5 LB OF A 10% SOLN. OF K<sub>2</sub>SO<sub>4</sub> FROM A COPPER WATERING CAN CALIBRATED TO HOLD 1.5 LB SOLUTION WHEN FILLED LEVEL FULL.

PASTE DRIED IN 100 TRAY TRUCKS FOR 22 HRS 11 HRS AT OUTLET POSITION & 11 HRS AT INLET. V.M. OF DRY PASTE < 1.0% N/C AND WATER VAPOUR PASS OUT THROUGH AN ALUMINUM COWL INTO THE POND WHERE THEY ARE TRAPPED.