GENERAL REQUIREMENTS:

SOLID NONMETALLIC MATERIALS (SNM) ARE NOT INTENDED TO BE A PERMANENT PART OF PLANT HARDWARE SUCH AS ELASTOMERS, PLASTICS, CLOTHS, SHEET, TUBING, STICKERS, BAGS, GLOVES, AND TAPE. CURED ADHESIVES, SEALANTS, LOCKING COMPOUNDS, AND EPOXIES WHICH ARE IN A SOLID FORM PRIOR TO CONTACT WITH HARDWARE MAY ALSO BE CONSIDERED SNM.

IT IS THE SELLER'S RESPONSIBILITY TO ENSURE THAT ITEMS IN THIS ORDER ARE TESTED AS REQUIRED HEREIN IN (SEE MIL-STD-2041 EXCERPTS THAT FOLLOW BELOW). TRACEABILITY FROM THE MATERIAL MANUFACTURER AND SUBSEQUENT SOURCES (DISTRIBUTORS) MUST BE MAINTAINED. TEST REPORTS SHALL BE CERTIFIED CORRECT AND IN ACCORDANCE WITH THIS STANDARD CLAUSE BY THE SIGNATURE AND DATE OF A AUTHORIZED SELLER'S REPRESENTATIVES AND THE SNM MANUFACTURER'S NAME, NAME OF THE SNM MATERIAL, GENERIC DESCRIPTION OF THE SNM, INCLUDING INFORMATION THAT IS NECESSARY TO DESCRIBE THE ACTUAL CONDITION TESTED (E.G., GLOVES, RUBBER SHEET, ETC.). THIS CERTIFICATION AND COPIES OF THE TEST REPORT SHALL ACCOMPANY ALL SHIPMENTS.

THE SELLER SHALL PROVIDE A TEST REPORT (QUANTITATIVE CHEMICAL ANALYSIS IN ACCORDANCE WITH THE REQUIREMENTS CONTAINED WITHIN THIS STANDARD CLAUSE) WHICH VERIFIES THAT THE VALUES ARE LESS THAN THE LIMITS IN THE BELOW TABLE. IF THE SOLID NONMETALLIC MATERIAL (SNM) HAS BEEN SATISFACTORILY TESTED WITHIN THE LAST FOUR YEARS, A COPY OF THAT TEST REPORT AND A STATEMENT BY THE SOLID NONMETALLIC MATERIAL MANUFACTURER THAT THERE HAVE BEEN NO CHANGES IN THE MANUFACTURING PROCESS IS ACCEPTABLE IN LIEU OF PERFORMING AN ADDITIONAL DETRIMENTAL MATERIAL ANALYSIS.

IN THE EVENT THAT THE SELLER IS UNABLE TO PROVIDE AN ACCEPTABLE TEST REPORT, ON A CASE BASIS WITH THE APPROVAL OF THE BUYER, THE SELLER MAY SUBMIT THE CERTIFICATION REQUIRED BY NOTE (1) BELOW AND ONE REPRESENTATIVE SAMPLE IDENTIFIED WITH THE SNM MANUFACTURER'S NAME, NAME OF THE SNM MATERIAL, GENERIC DESCRIPTION OF THE SNM, INCLUDING INFORMATION THAT IS NECESSARY TO DESCRIBE THE ACTUAL CONDITION TESTED (E.G., GLOVES, RUBBER SHEET, ETC.) TO ELECTRIC BOAT CORPORATION FOR TESTING AND APPROVAL PRIOR TO SHIPMENT OF THE MATERIAL.

ACCEPTANCE CRITERIA:

DETRIMENTAL MATERIAL LIMIT		ASTM METHOD
A) MERCURY (1) SEE NOTE 1	10 PPM	
B) HALIDES		
BROMIDES	250 PPM(TOTAL OR LEACHABLE)(2)(5)	D 1246(4)
CHLORIDES	250 PPM(TOTAL OR LEACHABLE)(2)(3)(5)	D 512(4)
FLUORIDES	250 PPM(TOTAL OR LEACHABLE)(2)(5)	D1179(4)
C) SULFUR	250 PPM(TOTAL OR LEACHABLE)(2)(3)(5)	D 516(4)

NOTES:

(1) THE SOLID NOMETALLIC MATERIAL MANUFACTURER SHALL CERTIFY THAT MERCURY AND MERCURY COMPOUNDS HAVE NOT BEEN ADDED TO THE MATERIAL AND HAVE NOT COME IN CONTACT WITH THE SOLID NONMETALLIC MATERIAL DURING PROCESSING OR THE SOLID NONMETALLIC MATERIAL MANUFACTURER SHALL CERTIFY THAT THE MATERIAL CONTAINS LESS THAN 10 PPM MERCURY, IN LIEU OF PERFORMING A CHEMICAL ANALYSIS.

(2) SOLID NONMETALLIC MATERIAL MAY BE ANALYZED FOR TOTAL HALOGENS AND SULFUR

INSTEAD OF WATER LEACHABLE HALOGENS AND SULFUR. 250 PPM(TOTAL)APPLY FOR HALOGENS AND 250 PPM (TOTAL) APPLY FOR SULFUR.

(3) WATER-LEACHABLE CHLORIDE AND SULFUR LIMITS OF 500 PPM EACH APPLY FOR RUBBER GLOVES AND TAPE, IN LIEU OF 250PPM EACH. RUBBER GLOVES MAY BE LEACHED TESTED A 150 DEG F MINIMUM VICE 200 DEG F MINIMUM.

(4) LON CHROMATOGRAPHY ANALYSIS IN ACCORDANCE WITH ASTM D 4327 AND INDUCTIVELY COUPLED PLASMA (ICP) ANALYSIS ARE ACCEPTABLE ALTERNATIVES FOR THE ASTM LEACHATE ANALYSES.

(5) SNM USED OVER 350 DEG SHALL BE ANALYZED FOR TOTAL HALOGENS AND SULFUR INSTEAD OF WATER LEACHABLE HALIDES AND SULFUR, UNLESS THEY ARE USED BELOW THE MANUFACTURER'S TEMPERATURE RATING.
SELECTED EXCERPTS FROM MIL-STD-2041 APPENDIX A

(6) 60. WATER LEACHING TESTS

60.1 THIS SECTION SPECIFIES TEST METHODS FOR MEASURING WATER LEACHABLE HALIDES (I.E., CHLORIDE, FLUORIDE, AND BROMIDE) AND WATER LEACHABLE SULFUR FROM NONMETALLIC MATERIALS.

60.2 TEST PROCEDURE. THE WATER LEACHING TEST SHALL BE PERFORMED AS FOLLOWS:
A. CUT ONE SPECIMEN FROM THE SELECTED SAMPLE, WEIGHING APPROXIMATELY 15 GRAMS, AND RECORD ITS EXACT WEIGHT TO 0.1 GRAM. THE SAMPLE WEIGHT MAY BE ADJUSTED PROVIDED THE RATIO OF SAMPLE WEIGHT TO FINAL VOLUME OF SOLUTION IS MAINTAINED (I.E., 15 G/500 ML).
B. CUT THE SPECIMEN INTO SMALL PIECES NOT GREATER THAN 1/4 INCH IN ANY DIMENSION.
C. PLACE THE SPECIMEN IN AN 800 MILLILITER (ML) OR LARGER BEAKER.
D. ADD APPROXIMATELY 400 ML OF DISTILLED WATER PER 15 GRAMS OF SAMPLE WEIGHT TO THE BEAKER.
E. COVER THE BEAKER WITH A WATCH GLASS AND HEAT FOR ONE HOUR MINIMUM 200-212 DEG F.
F. ALLOW THE BEAKER TO COOL TO ROOM TEMPERATURE.
G. VACUUM FILTER THE LEACHATE FROM THE BEAKER SEPARATELY THROUGH A PREWASHED FILTER (NO. 41) WHATMAN OR EQUIVALENT COARSE POROSITY FILTER) AND A BUCHNER FUNNEL. WASH THE BEAKER THOROUGHLY WITH DISTILLED WATER USING 10 OR MORE WASHES AND VACUUM FILTER THE WASH SOLUTIONS. DILUTE THE FILTRATE TO 500 ML, OR THE APPROPRIATE VOLUME TO MAINTAIN A 15 G/500 ML RATIO.
H. IF NECESSARY, STORE THE FILTRATE IN A CLEANED POLYETHYLENE OR GLASS CONTAINER COVERED TO PREVENT EVAPORATION.
I. PREPARE A CONTROL FILTRATE WITH NO SPECIMEN FOLLOWING THE INSTRUCTIONS IN D THROUGH H.

60.3 DETERMINATION OF LEACHABLE HALIDE ION CONCENTRATION. USING ALIQUOTS FROM THE CONTROL FILTRATION AND THE SAMPLE FILTRATE, THE CONCENTRATION OF BROMIDE, CHLORIDE, AND FLUORIDE IONS IN EACH FILTRATE SHALL BE DETERMINED BY AN APPROPRIATE METHOD OF ASTM D 1246, ASTM D 512, AND ASTM D 1179, RESPECTIVELY. THE CONCENTRATION OF WATER-LEACHABLE HALIDE IN THE MATERIAL SHALL BE DETERMINED AS FOLLOWS:
BROMIDE, CHLORIDE, OR FLUORIDE, MICRO G/G(PPM) = (C)(VS/M)WHERE:
C = CONCENTRATION OF BROMIDE, CHLORIDE, OR FLUORIDE IN FILTRATE, IN MILLIGRAMS PER LITER (MICROGRAMS PER MILLILITER), AND

VS = FINAL VOLUME OF SOLUTION IN MILLILITERS PER 60.2.G
M = GRAMS OF THE TEST SPECIMEN, PREPARED PER 60.2.A

60.4 DETERMINATION OF LEACHABLE SULFUR CONCENTRATION.
USING ALIQUOTS FROM THE CONTROL FILTRATE AND THE SAMPLE FILTRATE IN 60.2.G, DETERMINE THE CONCENTRATION OF SULFUR AS FOLLOWS:
A. PLACE 25 ML OF THE FILTRATE IN A 50 ML OR LARGER CLEAN BEAKER PROPERLY IDENTIFIED.
B. ADD DISTILLED WATER SATURATED WITH BROMINE DROP BY DROP WHILE STIRRING UNTIL A RED-BROWN COLOR PERSISTS. THEN COVER THE BEAKER WITH A WATCH GLASS.
C. HEAT THE SOLUTION IN THE COVERED BEAKER ON A HOT PLATE UNTIL THE BROMINE COLOR DISAPPEARS.
D. ALLOW THE SOLUTION TO COOL TO ROOM TEMPERATURE.
E. TRANSFER THE SOLUTION TO A VOLUMETRIC FLASK AND ADD DISTILLED WATER RINSES FROM THE BEAKER TO MAKE UP A FINAL VOLUME THAT IS CONSISTENT WITH THE SULFATE TEST METHOD. DETERMINE THE SULFATE ION CONCENTRATION OF THIS FINAL DILUTED VOLUME USING AN APPROPRIATE METHOD OF ASTM D 516.
F. USE THE FOLLOWING FORMULA TO OBTAIN THE WATER-LEACHABLE SULFUR CONCENTRATION OF FILTRATE: SULFUR, MICRO G/G (PPM)=(C)(VS)(V){0.334/((25.0)(M))}

WHERE:
C = CONCENTRATION OF SULFATE ION (SO4(-2)) IN FILTRATE, IN MILLIGRAMS PER LITER (MICROGRAMS PER MILLILITER), DETERMINED IN STEP E.
VS = FINAL VOLUME OF SOLUTION IN MILLILITERS PER 60.2.G
V = MILLILITERS OF FINAL DILUTED VOLUME, AND
M = GRAMS OF THE TEST SPECIMEN, PREPARED PER 60.2.A 60.4.1 NOT APPLICABLE TO THIS PURCHASE ORDER

60.5 ACCEPTABLE ALTERNATE TEST METHODS.
ION CHROMATOGRAPHY ANALYSIS IN ACCORDANCE WITH ASTM D 4327 AND INDUCTIVELY COUPLED PLASMA (ICP) ANALYSIS ARE ACCEPTABLE ALTERNATES FOR THE ASTM ANALYSIS SPECIFIED HEREIN. IN ADDITION, OTHER ALTERNATE ANALYSIS MAY BE USED WHEN APPROVED BY NAVSEA OR ITS AUTHORIZED REPRESENTATIVE.