

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

WARRANTY PROGRAM

FOR

600 GPH REVERSE OSMOSIS WATER PURIFICATION UNIT (ROWPU)
MODEL NUMBERS: WPES-1

Headquarters, Department of the Army, Washington, D.C.

3 JULY 1992

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MMTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

1. General. This Warranty Technical Bulletin (WTB) identifies warranty conditions and procedures that apply to the 600 GPH Reverse Osmosis Water Purification Unit (ROWPU) NSN 4610-01-026-8980, as supplied under Contract DAAK01-87-C-A018. Warranty coverage is for the period of two years from date of issue and not to exceed four years from date of delivery as shown on the Material Inspection and Receiving Report (DD Form 250).

2. Explanation of Terms. The following terms apply to the ROWPU warranty program:

a. Abuse. The improper use, repair or handling of warranted items such that the warranty may become void. Failure to perform preventive maintenance or improperly performed corrective maintenance also constitutes abuse.

b. Acceptance Date. The date an item of equipment is accepted into Department of Defense (DOD) inventory by the execution and signing of a DD Form 250 or an approved acceptance document by an authorized Government representative.

c. Contractor support. Those services that are to be performed and those responsibilities that are placed on the contractor by the Government as specified in the warranty contract/provisions of Contract DAAK01-87-C-A-018. This support, which may include items such as labor, parts, tools, training, technical packages, etc., will be used in support of the warranted equipment during the specified warranty period.

d. Latent defects. Latent defects are defects that are not immediately obvious as a result of systematic engineering review of designs or documentation.

*This manual supersedes TB 5-4610-215-24/3, dated 5 June 1989.

3. Coverage - Specific. Engineered Air Systems, Inc. (EASI), (the contractor) warrants that each 600 GPH Reverse Osmosis Purification Unit (ROWPU) and each component of the ROWPU is manufactured to conform to specific performance requirements identified in Contract DAAK01-87-C-A018. Additionally, EASI warrants that each ROWPU and components of that same ROWPU are free from defects in materials and workmanship that would cause the ROWPU to fail to conform to performance requirements specified in Contract DAAK01-87-C-A018. These conditions apply for a period of two years from date of issue not to exceed four years from date of delivery as shown on the Material Inspection Receiving Report (DD Form 250). This warranty applies only to components originally installed by EASI which can be identified by serial number as factory-installed on a specific ROWPU or to components repaired under the conditions of this warranty. The sole obligation of EASI shall be, at its option, to repair or replace any article or part which is proven to be other than warranted. For EASI to be obligated under this warranty, EASI must be notified, in writing, within thirty days of discovery of a failed component or item. Upon determination that a defect is covered by this warranty, EASI will replace or repair (at its option) without charge to the U.S. Government. If the defect is determined not to be covered by this warranty, EASI will advise the Warranty Control Office (WARCO) and will not proceed until written authorization and costing information is agreed upon. Under this warranty, the contractor is limited to the repair or replacement of a defective article. If repair or replacement is impossible or cannot be accomplished in time to meet Government schedules, the contractor will refund the purchase price including transportation. If the contractor determines that a unit or component is not, for any reason, covered by this warranty, no warranty work will be performed except at the written direction of the Contracting Officer for Contract DAAK-87-C-A018. Thereafter, the matter will proceed through the "Disputes" clause of this document. In the case of Government-furnished equipment or property, EASI warrants that installation to (or of) Government-furnished property by EASI will not degrade the performance or reliability of that Government-furnished property. Modification of Government-furnished property by EASI (other than installation of equipment) is warranted for two years from the date of acceptance.

4. Contractor Responsibilities. EASI is responsible for providing repair or replacement of warranted items/components within 30 days after notification. EASI is located at 1270 North Price Road, St. Louis, MO. 63132, (314) 993-5880). The items determined to be defective due to defective material or workmanship, will be replaced with new or rebuilt items at no cost to the Government. Transportation costs for warranty service will be borne by the contractor.

5. Government Responsibilities. Using activities are responsible for reporting failures to U.S. Army Troop Support Command, 4300 Goodfellow Blvd., Attn: AMSTR-MEPN, St. Louis, Mo. 63120-1798, AUTOVON 693-9393, CMCL (314) 263-9393 during the hours of 0700-1500 CST. U.S. Army Troop Support Command shall be responsible for administering the warranty program for the ROWPU.

6. Government Maintenance. The Government will be responsible for completing preventive and corrective maintenance in accordance with the approved Maintenance Allocation Chart. The Government will also be responsible for maintaining and providing to EASI appropriate maintenance records for each ROWPU by serial number and each maintenance action performed on each ROWPU or ROWPU component by serial number (if applicable). The Government will make these records available for contractor examination to determine warranty coverage for components and/or end items.

7. Owning Unit Responsibilities. The owning unit responsibilities shall be the same as those identified in the **Government Responsibilities** and **Government Maintenance** paragraphs.

8. Warranty Control Office (WARCO) Responsibilities. The WARCO for ROWPU is U.S. Army Troop Support Command, 4300 Goodfellow, St. Louis, MO. WARCO responsibilities are identified in the **Government Responsibilities** paragraph.

9. Army Oil Analysis Program (AOAP). The AOAP does not apply to the ROWPU.

10. Alterations/Modifications. Alterations and modifications shall not be made unless expressly authorized or directed by: U.S. Army Troop Support Command, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798.

11. Design Performance Specifications. Equipment performance is as specified in the appropriate technical manual. The warranty tag for the unit is located on the unit control panel or on the frame.

12. Nullification. Actions taken by Government personnel which will void ROWPU end item or component warranties are:

- a. Failure to operate the ROWPU and/or components in accordance with approved Technical Manuals;
- b. Failure to maintain the ROWPU and/or components in accordance with approved Maintenance Allocation Chart recommendation and Technical Manual procedures;
- c. Failure to properly install, connect, position or adjust the end item and/or components as prescribed by the appropriate Technical Manuals;
- d. Failure to adequately preserve a ROWPU unit before placing said unit into storage or failure to adequately depreserve a ROWPU when said unit is removed from storage;
- e. Transportation or storage of a ROWPU unit under conditions determined to be detrimental to the performance of the unit;
- f. Operation of the end item and/or components outside stated performance parameters;
- g. Operation of the end item and/or components for purposes other than intended (as a water purification system):
- h. Removal of components from one serial-numbered ROWPU for reinstallation on a different serial-numbered ROWPU (cannibalization). (Installation of components that have been repaired under this warranty program being an exception):
- i. Modification or retrofit of components or equipment not expressly authorized by EASI;
- j. Failure to maintain appropriate documentation that would resolve, conclusively, any question concerning the use, maintenance or deployment of the end item resulting in a warranty claim;
- k. Deployment of the end item in a combat zone or exposure of the end item to combat conditions;
- l. This warranty does not apply to damage resulting from latent defects in maintenance philosophy, Maintenance Allocation Charts, Technical Manuals or literature. This warranty does not apply to equipment damaged as a result of incorrect Technical Manuals or literature;
- m. This warranty does not apply to spare parts or equipment supplied by contractors other than EASI or as noted otherwise in this bulletin.

Actions required to keep this warranty in effect are:

- a. Proper maintenance (both preventive and corrective) of equipment as prescribed by approved Maintenance Allocation Charts and Technical Publications;
- b. Transportation, preservation, depreservation and storage in accordance with technical documentation;

- c. Operation of the end item and components within stated performance envelope(s);
- d. Use of the end item for its intended purpose.

13. Abuse Determination. When abuse is suspected but not obvious, it is the Government's responsibility to provide documentation of the maintenance of the item to allow the contractor or a joint contractor/Government panel to determine if abuse has occurred. If abuse (as defined in this bulletin) becomes evident, the Government will reimburse the contractor for the repair and associated repair and transportation costs. Warranties for replacement parts will be the same as the warranty on replacement parts supplied in non-abuse situations.

14. Abuse Avoidance. When abuse (intentional or unintentional) has been determined, a statement shall be made by the abuse determining activity as to how abuse can be avoided in the future.

15. Claim Procedures. When the need for warranty service becomes evident, the following steps must be completed:

- a. **Identification of Failed Items.** Failed items should be identified as follows:

(1) Failed warranty items should be tagged/identified to prevent improper repair or use. DA Form 2402 Exchange Tag shall be completed and attached to the defective component. Refer to Appendix A for instructions on completing DA Form 2402.

(2) DA Form 2407 Maintenance Request is to be completed. Refer to Appendix B for instructions on completing DA Form 2407.

(3) The WARCO and EASI must be notified of the failure in writing within 30 days of failure occurrence.

(4) Non-direct exchange (non-DX) claim items. When the warranted item is not handled through DX, the unit prepares and sends a completed DA Form 2402 (with exhibit) and DA Form 2407 to the installation warranty claims office. The office then deals with the DA Form 2407 as follows:

(a) Send copy #1, #2, and #5 to CDR, TROSCOM, ATTN: AMSTR-MOF, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. One of these copies will go to the item manager to show a supply demand.

(b) Keep copy #3 for 180 days (with exhibit and DA Form 2402) unless you are told differently. If you receive no instructions after 90 days, contact: CDR, TROSCOM, ATTN: AMSTR-MEPN, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798, telephone number 314-263-9393 for information.

(c) Copy #4 gives you the authority to tell the claim creator to get the new item through supply. Copy #4 is kept at most for 180 days or until you get notice that the claim has been honored.

(5) Direct exchange (DX) claim items. When the warranted item is handled through DX, the unit starting the claim action fills out the same forms and deals with them the way they do for a non-DX item except as follows:

(a) The unit running the DX shop starts the replacement action for supported units. The DX shop uses copy #4 of the DA Form 2407 to start the action.

(b) Normal DX replacement actions will be made by the DX shop for like serviceable items in stock.

(6) Final processing of approved claims. Support of depot maintenance units will handle all claims promptly. These units will send approved claims to the creator whose address and MILSTRIP document number is in Block 20 of DA Form 2407. The support or depot unit will also return to the replacing unit all labor costs used in replacing the bad items. Refer to Appendix B for information on completing DA Form 2407 and Appendix A for information on completing DA Form 2402.

b. Disposition of Failed Items. Failed items will be dispositioned in accordance with instructions issued by the appropriate WARCO after review of the documentation submitted.

(1) False Returns. Government units returning items to the contractor for repair which are found to be serviceable will be penalized for the cost, loss of time, nonavailability of items or other restrictions. False returns will be monitored by TROSCOM.

(2) Receipts/verification of contractor repairs.

c. Special Area Requirements. If an item or component is located in the Continental United States (CONUS), the item will be returned to the destination identified for that component or to seller's plant, whichever is advantageous to the Government. In the event components are located outside CONUS, the appropriate WARCO shall be contacted for disposition instructions.

d. Reimbursement for Army Repair. The Army shall proceed with non-contractor repair only after negotiation and settlement with the contractor concerning the scope of repairs to be performed by Army personnel. Army repair of hardware shall proceed only upon receipt of written instructions from the contractor and appropriate WARCO.

e. Claim Denials/Disputes. Claim denials/disputes will be addressed through the WARCO and by EASI. When a dispute arises, settlement will be established by negotiation between TROSCOM and the Contracts department of EASI.

f. Reporting. Reporting or recording action on a failed item shall be as specified in DA Pam 738-750 or DA Pam 738-751.

Appendix A

DA Form 2402

COPY 1

1. SUPPORT AGENCY (DODAAC)		2. DATE	
3. ORGANIZATION (DODAAC)		4. <input type="checkbox"/> EIR EXHIBIT <input type="checkbox"/> EXCHANGE	
5. NSN		6. NOUN NOMENCLATURE	
7. PD	8. PD AUTHENTICATION		
END ITEM IDENTIFICATION	9. END ITEM NOUN NOMENCLATURE		
	10. MODEL	11. SERIAL NO.	
12. DEFICIENCY OR SYMPTOM			
13. DATE ACCEPTED	14. SIGNATURE		15. NMCS
16. JOB		17. INITIALS	
18. DATE REPAIRED		19. INITIALS	

DA FORM 2402
MAY 61

6 shown of Sep 73
in circulation

• U S GOVT PRINTING OFF 1963
754-126

EXCHANGE TAG (TM 38-750)

1. **SUPPORT AGENCY (DODAAC).** Enter the DODAAC of the support activity that will exchange the item for you. When this form is used for other than exchanges, use the DODAAC or UIC.
2. **DATE.** Enter the Julian date the item was prepared for exchange
3. **ORGANIZATION (DODAAC).** Enter the DODAAC of the unit or organization needing to exchange the item. When this form is used for other exchanges, use the DODAAC or UIC.
4. **EIR EXHIBIT/EXCHANGE.** Mark the block to show an exchange or EIR exhibit. When used for warranty claims, put a "W" in the open space to the right of EIR EXHIBIT.
5. **NSN.** Enter the NSN of the item.
6. **NOUN NOMENCLATURE.** Print the noun abbreviation of the item to be exchanged.
7. **PD.** Enter the priority designator (PD) that applies to the action. The unit or organization listed in Block 3 normally assigns the PD. When the exchange supports a customer maintenance request, use the PD of the maintenance request.

8. PD AUTHENTICATION.

- a. The commander or the designated representative signs when a PD of 01 through 10 is in Block 7.
- b. Enter the job order number when a PD of 01 through 10 is taken from a maintenance request.

9. END ITEM NOMENCLATURE. Enter the noun abbreviation of the end item for the part or component in Block 5.

10. MODEL. Enter the model number of the end item.

11. SERIAL NO. Enter the serial number of the end item.

12. DEFICIENCY OR SYMPTOM. Briefly describe the problem.

13. DATE ACCEPTED. When the form is used as a receipt, the exchange facility will enter the Julian date.

14. SIGNATURE. The person who receives the item for exchange, signs.

15. NMCS. Print the word "Yes" for an NMCS condition.

16. JON. The facility that will repair the item enters the job number.

17. INITIALS. The person receiving the item for repair initials in this block.

18. DATE REPAIRED. The person doing the work enters the date the work was finished.

19. INITIALS. The person doing the work initials in this block.

APPENDIX B

DA FORM 2407

MAINTENANCE REQUEST		PAGE NO	NO OF PAGES	ACQUISITION CONTROL SYMBOL
FORM NO. 2407, 1-64; USE PREVIOUS EDITIONS UNLESS SPECIFIED				
SECTION I - EQUIPMENT DATA				
CONTROL NUMBER L08610	WORK ORDER NUMBER	WESDC	ORG PD	PD AUTHENTICATION
<input type="checkbox"/> WORK REQUEST <input type="checkbox"/> MWO <input type="checkbox"/> WARRANTY CLAIM	1a. ORGANIZATION	b. LOCATION		c. UNIT IDENT CODE
1. SERIAL NO	2. NOUN NOMENCLATURE	3. LINE NO.	4. MODEL	5. NATIONAL STOCK NUMBER

Page No/No of Pages. Enter the page number Total pages will be entered when entries in Section II are complete.

Work Order Number. Leave blank.

WESDC. Leave blank.

ORG PD. Leave blank

PD Authentication. Leave blank.

Work Request. Leave blank.

MWO. Leave blank

Warranty. Mark this block.

1a ORGANIZATION. Enter location of organization sending in the report.

1b LOCATION. Enter the name of organization writing the request (overseas list APO only)

1c UNIT IDENT CODE. Enter unit identification code (UIC) of the unit shown in block 1a.

2. SERIAL NO.

a. For nontactical wheeled vehicles, list the USA registration number.

b. For ammunition, put in the lot number.

c. For all other items, list the serial number, if known. For floating craft, list the Department of Army Hull number. If more than one serial number, leave blank.

d. When using this form for more than one item or component, leave blank.

3. NOUN NOMENCLATURE

Put in name abbreviation of equipment for which the form was started.

4. LINE NO. Leave blank

5. MODEL. Put in the item model number

6. NATIONAL STOCK NUMBER. Put in the National Stock Number of equipment in block 3.

When completing this form for many items having several NSNs, leave blank

7 MAINTENANCE ACTIVITY	8 LEVEL	9 UTILIZATION CODE	10 MCSR ITEM	11 ERC	12 PACING ITEM	13 HOURS	14 MILES	15 ROUNDS	16 STARTS
14 FAILURE DETECTED DURING (Select one - use 7 or X)					15 FIRST INDICATION OF TROUBLE (Select one - use 7 or X)				
<input type="checkbox"/> 08 Noisy	<input type="checkbox"/> 06 Type	<input type="checkbox"/> 01 Stopped	<input type="checkbox"/> 04 Paged	<input type="checkbox"/> 008 Intermittent	<input type="checkbox"/> 028 Overheating	<input type="checkbox"/> 790 Out of Adjustment			
<input type="checkbox"/> 02 Hanging	<input type="checkbox"/> 03 Normal Op.	<input type="checkbox"/> 02 Intermittent	<input type="checkbox"/> 04 Other	<input type="checkbox"/> 008 Heavy	<input type="checkbox"/> 387 Low Performance	<input type="checkbox"/> 000 Other			
16 DESCRIBE DEFICIENCIES OR SYMPTOMS ON THE BASIS OF COMPLETE CHECKOUT AND DIAGNOSTIC PROCEDURES IN EQUIPMENT TB 10 and previous versions									
16a. REMARKS									

- 7. **Maintenance Activity.** Put in the name of your support activity.
 - a. **Level.** Put in the code of the maintenance level doing the maintenance.
 - O - Unit
 - F - Direct Support (DS)
 - H- General Support (GS)
 - D - Depot
 - L - Special Repair Activity
 - 8. **Utilization Code.** For nontactical wheeled vehicles in administrative use, use utilization code "V".
 - 9. **MCSR Item.** Leave blank.
 - 9a. **ERC.** Leave blank.
 - 9b. **Pacing Items.** Leave blank.
 - 10. **Hours.** Put in the hour reading (rounded to the nearest hour) from the hour meter on the equipment in block 3.
 - 11. **Miles.** Put in the mileage (rounded to the nearest mile) of the equipment in block 3.
 - 12. **Rounds.** Leave blank.
 - 13. **Starts.** For turbine engines, put in the number of hot starts. If not needed, leave blank.
 - 14. **Failure Detected During.** Mark the box that best describes when the failure was found.
 - 15. **FIRST INDICATION OF TROUBLE.** Mark the box that best describes the conditions when you first found the trouble. Write in a code number from the table below. Leave blank if block 14 is left blank or when listing sampled items for unit maintenance.
- | | |
|------|--------------------------|
| Code | Description |
| 008 | Noisy |
| 068 | Inoperative |
| 258 | Overheating |
| 387 | Low performance |
| 790 | Out of adjustment |
| *380 | Intermittent |
| *432 | Off frequency |
| *580 | Unstable |
| *077 | Accident (motor vehicle) |
| *777 | Accident (motor vehicle) |
| *099 | Other |
- * The asterisk shows code numbers not listed in block 15, DA Form 2407. If you select one of these codes, the proper code number must be put in the space called "Other," block 15.
- 16 & 16a. Leave blank.

SECTION II - WORK ACCOMPLISHED								
1. REPAIR ORGANIZATION/ACTIVITY			2. UNIT IDENT CODE		10. TYPE ORGANIZATION/ACTIVITY AC. COMPLETION CODE (Select one - a, b, c, d, e)		11. AMS ACCOUNT CODE	
3. LOCATION					<input type="checkbox"/> 1 TO <input type="checkbox"/> 2 TO <input type="checkbox"/> 3 CONTRACTOR			
18. ACT CODE	19. FAILURE CODE	4. COMPONENT/PART HOUR SUC OR MFD NO.	5. MANHOURS	6. NATIONAL STOCK NUMBER	7. PARTS COST	8. CITY	9. PARTS COST	10. PARTS COST
		4. CB CODE	5. REF DESIGNATOR	6. UPR CODE				
17. DELAY (Select one) <input type="checkbox"/> 1 Part <input type="checkbox"/> 2 Manpower <input type="checkbox"/> 3 Facilities <input type="checkbox"/> 4 Tools <input type="checkbox"/> 5 Other			16. TOTAL MANHOURS		15. TOTAL MANHOUR COST		14. TOTAL PARTS COST	
23. SUBMITTED BY			22. RECEIVED BY		21. CODE NUMBER BY		20. INSPECTED BY	
JULIAN DATE			JULIAN DATE		JULIAN DATE		JULIAN DATE	
24. DATA TRANSCRIBED			23. TO USER		22. TO USER		21. TO USER	
24. DATA TRANSCRIBED			23. TO USER		22. TO USER		21. TO USER	

DA FORM 2407

EDITION OF JUL 75 IS OBSOLETE.

ORGANIZATION COPY 4

17a thru 18. Leave blank

19. **CONTRACT NUMBER (DAAK01-87-C-A018).**

20d. **CB CODE.** Put In the name of the part or assembly under warranty.

20e. **REF DESIGNATOR.** Put in the serial number of the part or assembly under warranty.

20g. Put In the estimated number of hours needed to replace the bad part. Use the proper technical bulletin time schedule guide to get the estimated hours. If you can't get the guide, use actual hours.

20h. **NATIONAL STOCK NUMBER.** Put in the NSN of the bad part. If an NSN is not found, use the part number.

20i.k.k. Leave blank.

20a thru 20k. Using the remaining spaces in block 20a-20k, put in this information: The

NSN of the defective item.

The name of the defective item.

The date of the failure.

The complete telephone number (AUTOVON/commercial with area code) of the person creating the form. State clearly all factors which added to the failure. Include factors such as type of operation and land and weather conditions. State clearly your opinion as to why the part failed.

20l. **Total Manhours.** Self-explained.

20m. **Total Manhour Cost.** Leave blank.

20n. **Total Parts Cost.** Self-explained.

21 thru 22. Leave blank.

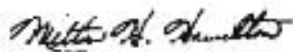
23. **Submitted.** The person authorized to send DA Form 2407 signs here.

24 thru 28. Leave blank.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:




MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
01892

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		FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)	
PUBLICATION NUMBER		DATE SENT	
PUBLICATION DATE		PUBLICATION TITLE	
BE EXACT PIN-POINT WHERE IT IS			
PAGE NO.	PARA- GRAPH	FIGURE NO.	TABLE NO.
<p style="font-weight: bold; margin-top: 0;">IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.</p>			
PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER			SIGN HERE

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 decagram = 10 grams = .35 ounce
 1 hectogram = 10 decagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
----	------------------------	----------------------------	---------------------	----

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