

MIL-STD-21A
 NOTICE 1
15 April 1974

MILITARY STANDARD

WELDED-JOINT DESIGNS, ARMORED-TANK TYPE

TO ALL HOLDERS OF MIL-STD-21A

1. The following pages of MIL-STD-21A have been revised and supersede the pages listed:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
11	15 April 1974	11	26 November 1968
1	15 April 1974	1	26 November 1968
2	15 April 1974	2	26 November 1968

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-21A will verify that page change and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until Military Standard is completely revised or cancelled.

Custodians:

Army - AT
 Navy - SH

Preparing Activity:

Army - AT

Review Activity:

Army - EL

Project No. DRPR-0170

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MIL-STD-21A
15 April 1974

DEPARTMENT OF DEFENSE

WASHINGTON, D. C. 20301

WELDED-JOINT DESIGNS, ARMORED-TANK TYPE

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1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense.
2. Recommended corrections, additions, or deletions should be addressed to the U. S. Army Tank-Automotive Command, Warren, Michigan 48090.

Supersedes page 11 of 26 November 1968.

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1. SCOPE

1.1 Purpose. This standard covers the design of joints for structures when one or more of the materials being joined is armor and welding is performed using the shielded metal arc process (stick electrodes).

1.2 Application. The joints specified in this standard are intended for use in military vehicles or other structures that are to be subjected to ballistic attack. Each application shall be subject to the approval of the procuring activity. The provisions of this standard refer entirely to full penetration-weld joints. In many armor vehicle designs, partial penetration type weld joints (joints not welded through the complete thickness of a plate) are being used. Some of these contribute mechanical strength to a welded joint to defeat ballistic impacts. The choice of these designs is very numerous. The different types of armor materials currently being used or contemplated coupled with various plate thickness combinations, plate angles, and other considerations make it impractical to include this immense variety in a general type armor joint design specification.

2. REFERENCED DOCUMENTS

2.1 Other publications. The following documents form a part of this standard to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

Welding Symbols	AWS A2.0-68
Terms and Definitions	AWS A3.0-69

(Copies may be purchased from the AMERICAN WELDING SOCIETY, 2501 Northwest 7th Street, Miami, Florida 33125)

3. DEFINITIONS

Supersedes page 1 of 26 November 1968.

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3.1 Welding terms. Unless otherwise specified herein, terms used in referring to the joints shall have the meanings defined in AWS A3.0-69.

4. GENERAL REQUIREMENTS

4.1 Selection of joint types.

4.1.1 Exposed surfaces. Surfaces subjected to ballistic attack, other than external attachments, generally shall be designed in accordance with joints 1-7, however fillet welds may be used for surfaces directly exposed to ballistic attack provided they have mechanical reinforcement inherent in the part design. This reinforcement shall be effective from all possible directions of ballistic impact. (see figure 10).

4.1.2 Other surfaces. Surfaces not subjected to direct ballistic attack and attachments may be designed using joint types 8(a), 8(b), 9 and 10.

4.2 Tolerances on design openings. The design opening tolerances shown for various joint types are assembly tolerances and should not be considered as tolerances available for plate size variation but should include all other tolerances that may affect design opening, such as plate flatness, but not weld shrinkage.

4.3 Sample drawing. The isometric drawing (fig. 11) is included as a guide only to show typical locations of various joint designs in an armored structure or vehicle. Encircled numbers on the drawing should be taken as referring to the particular type of joint described in this standard. Suffix letters (joints 1-7 inclusive) have been omitted, since they identify plate thicknesses and other details, which will vary with the design of a specific structure of vehicle.

5. DETAIL REQUIREMENTS

5.1 Groove type. Grooved joints shall be as shown in 5.1.1 to 5.1.7 as selected in accordance with design requirements.

5.1.1 Type No. 1. Single-V-grooved butt joint, welded both sides.

5.1.1.1 The information in the table and following notes shall be included on drawings when this type of joint is used. When so placed on the drawing, or when this joint design is made a part of the contract, the information shall be considered as part of the requirements.

Supersedes page 2 of 26 November 1968.