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# Cwb welding symbols chart pdf printable form free

August 2003 185 W59-03 © Canadian Standards Association D1.7 Flare Bevel Groove Weld Symbol The welding symbol for flare bevel groove welds in T-joints indicates the weld face width, w. Double-Fillet Welding Symbol Weld size (length of leg) 5F Specification, process, or other reference 8 12 24. see Notes (2) "R" indicates backing removed after welding. - Symbol: . Single V-Groove Welding Symbol Length -Omission indicates that weld extends between abrupt changes in direction or as dimensioned 75 75 18. Example: (See Joints M1-3 and F1-3 of Clause 10.) G Effective Throat = T Effective Throat = T \*Joints M1-3 and F1-3 of Clause 10. © Canadian Standards Association Welded Steel Construction (Metal Arc Welding) Appendix D Welding Symbols Note: This Appendix is not a mandatory part of this Standard. Figure D1 (Concluded) 188 August 2003 Appendix D - Welding Symbols Figure D1 Standard Welding Symbols (Adapted to Scope of CSA W59-M Standard) 1 1 BASIC WELDING SYMBOLS and THEIR LOCATION SIGNIFICANCE 1 LOCATION OF F L E E M E N T S OF A WELDING SYMBOL Groove Angle; Included Angle of countersink for Plug Welds F-n-sh symbol I/- Contour symbol l Effective Throat Depth of Preparation; size for certain welds Length of Weld Field Weld symbol Pitch (centre-to-centre spacing) of Welds - Arrow connecting Reference Line to arrow-side member of Joint I T Used reference not used) 1 Basic weld symbol or Detail reference Weld All-Around Field Weld MeltThru 1 --reference Line I &:::B, CONTOUR, ....., CONWMMABLE I on vex I ~ - u s h concave breviations are t o be included i n the tail of the weldina symbol, reference is made toTable A. De- Flush con tour symbol indicates face of weld t o be made approximately flush. Weld-All-Around Symbol 1. These finishing symbols indicate the method, not the degree, of finish. Abbreviations With modified groove weld symbol M Joint Not Used G Notes: (1) Material (M) and dimension of backing as specified. Joint with Spacer Arrow side of joint Arrow of welding symbol Not Used First operation shown on reference line nearest arrow Any applicable weld symbol 1 Arrow of welding symbol Not Used Field weld symbol indicates that weld is to be made at a place other than that of initial construction Arrow side of joint Arrow of welding symbol Not Used Convex contour symbol indicates face of weld to be finished to convex contour by grinding 7. STUD WELDING SYMBOL First operation r TLpclr Welding -. Omission o f depth Lengti Om--sionindicates that weld extends between abrupt changes i n direction ar as dimensioned Specification. Pitch The spot weld symbol placed above the reference line indicates that the spot weld is to be made on the "other side" and not the "arrow side" member. 1 Such preparation may be used in the joint after fitting or on the second side of the joint after welding the first side. See Clause 01.2 o f Appendix D. Field Weld Symbol Arrow side of joint Arc Spot Flush contour symbol indicates face of weld to be made approximately flush. Second operation 80-200 Slot length Included countersink angle 30° BACKING WELD OR First operation Note: Location and orientation of welds to be shown on the drawing. Basic Joints — Corner Joint Stud 11. For complete joint penetration groove welds, as specified above, the symbol need not include the designations of the effective throat "(E)" for each side of the joint. o f hole at root) 21 GTSM signifies total effect--vethroat ~ s e q u a lto the thickness of material. 16. a r test informationP With groove-weld symbol 1 5 reference line nearest arrow Second operation. Preparation prior to fitting D1.5 Drawing Convention for Prequalified Joints (Clause 10) Solid lines indicate groove preparation prior to assembly for welding. D1.2 Symbols Convention for Grooves Welded from Both Sides with Back-Gouging The use of GTSM (gouge to sound metal) in the tail of the welding symbol designates that a complete joint penetration groove weld is to be produced. See Clause D1.2 of Appendix D. The Contractor may choose to make the GTSM reference a general note on the shop or erection drawing. Notes: (1) Arc spot weld symbols can be placed above or below the reference line, depending on whether welding is to be done on the "other side" or the "arrow side" member respectively. (3) See Clause D1.6. 10. Double Bevel Groove Welding Symbol Arrow points toward member to be prepared Omission of depth of preparation and effective throat indicates total depth of preparation--symmetrical in case of double groove welds--equal to the thickness of the member and, hence, complete joint penetration groove weld is required (25) (30) Weld size (length of leg) Length of increments Effective throat 19. The only complete and official presentation of the standard welding symbols is in A2.4. FIGURE 19-51 1 k r n wml-d-ng~ y m w Typical welding symbols including use of supplementary symbols. Slot Welding Symbol Depth of filling (omission indicates filling is complete) GTSM Second operation 30° 10 12 10 27. Notes: (1) Stud weld symbol is always below the reference line. i t Indicates weld w i t h out su bsequent finishing BUTT JOINT 1 6 WELD-ALL-AROUND SYMBOL 3 CORNER JOINT 1 8 F ~ r s operation t shown on \ Size (height) n o special height desired 1 9 JOINT W I T H BACKING NOTES - Mater-al ( M ) and See - I BASIC JOINTS A r r o w side o f joint EDGE JOINT supplementary data T h i r d operation. Complete Joint Penetration CJP Indicates complete joint penetration groove weld regardless of type of weld and joint preparation To be used on design drawing only (see Clause 4.1.1.1.4) 14. Example: S G 0 (See Joint S2-2 of Figure 10.3.) Effective Throat = T \*Joints = S2-2, S2-6, S6-1, S6-4, S8-1, S8-4 of Clause 10. Arc Spot Welding Symbol Omission of effective throat without designating the weld as "seal weld" in the tail of the symbol indicates complete joint penetration is required Number of Diameter of spot weld (10) Spot Welds required at faying surface.\* \*Instead of diameter the 0 80 SMAW required shear strength per spot can be specified. (2) See Clause D1. 6. GTSM - Gouge To Sound Metal CJP - Complete Joint Penetration PJP - Partial Joint Penetration 0-30° (Continued) Figure D1 American Welding Society Standard Welding Symbols ADAPTED TO SCOPE OF CSA STANDARD W59 August 2003 187 W59-03 © Canadian Standards Association Basic Welding Symbols and Their Location Significance Square Groove V-Groove Bevel Groove U-Groove J-Groove Flare V-Groove Location Significance Flare Bevel Groove Arrow Side Other Side Both Sides 17. D1.3.3 Single groove welds in joints with steel backing are complete joint penetration groove welds. Depth of filling in m (omission indicates f i l l ~ n g i s c o m ~ l e t e l Second operation Orientation, location, or - Omission indicates LAP JOINT Indicates complete j o i n t penetration groove weld regardless o f type o f w e l d and joint preparation M E L T - T H R U SYMBOL Any applicable weld symbol 4 BASIC JOINTS I Convex c o n t o u r symbol indicates face of weld t o be finished t o convex contour by grinding Flaq points away f r o m the arrow ( ~ 5 recommendarion) 9 Field weld symbol indicates that weld is to be made at a place other than t h a t o f i n ~ t i a construction l i JOINTS CONVEX CONTOUR SYMBOL F ~ n i s h symbol (user's standard) indicates m e t h o d of obtaining specified contour \ b u t n o t degree o f finish - Weld-all.around symbol indicates that weld extends completely around the j o ~ n r Arrow of welding symbol 112 / = 10 dimens--onof backing as specified. Examples: GTSM S G 0 S2 (See Joint M2-1 of Clause 10.) 02 GTSM S1 G 01 August 2003 (See Joint M3-2 of Clause 10.) 183 W59-03 © Canadian Standards Association D1.3 Symbol Presentation of Complete Joint Penetration Groove Welds in Joints of Clause 10 Other than Those Requiring Back-Gouging D1.3.1 Single SAW groove welds in joints\* welded from both sides without gouging to sound metal, for which the symbol shows only the depth of preparation "S", are complete joint penetration groove welds. Finishing of Welds C G M R H - - - - Chipping Grinding Machining Rolling Hammering Finishing of welds other than cleaning is indicated by suitable contour and finish symbols. ----A- When used w i t h o u l a surface finish symbol. Example: S T (T) G (See Joint M2-4 of Figure 10.1.) 0 184 August 2003 © Canadian Standards Association Welded Steel Construction (Metal Arc Welding) D1.4 Drawing Convention for Welding Symbols Dotted lines indicate preparation of U- or J-grooves by the arc-air process. Chain Intermittent Fillet Welding Symbol 8 0 Pitch - distance between centres of increments 50-150 50-150 Depth of preparation 12 (12) 0 60° Effective throat Groove angle Root opening 25. Convex Contour Symbol Finish symbol (user's standard) indicates method of obtaining specified contour but no degree of finish G 13. D1.8 Flare V-Groove Weld Symbol When a flare V-groove is formed as a result of a bevelled edge of a planer surface butting longitudinally along a curved surface, the welding symbol shown shall be as follows: (E) 0 Note: This welding symbol is specific to CSA Standard W59. Welding Symbols D1.1 General Additional welding symbol information and drawing conventions have been used in Clause 10 of this Standard and are shown in the following Clauses of this Appendix. Dotted lines indicate gouging to sound metal. Basic Joints — Butt Joint Plug or Slot Fillet Arrow Side Field weld symbol Elements in this area remain as shown when tail and arrow are reversed Root opening; depth of filling for plug and slot welds Weld All-Around Location Significance Double bevel symbol see Notes Notes: (1) Material (M) and dimensions of spacer as specified. Length of increments Size - diameter of hole at root 26. Basic Joints — Lap Joint With groove weld symbol Other side of joint MR Arrow side of joint 5. process, or other reference Root opening Pitch (distance between centres) of increments Size (length o f leg) 19 - 1 Omission of depth o f preparation and effective throat indicates total depth o f preparation - symmetrical i n case of doublelroovn welds equal t o the thicknessof the member and.hence.complete j o i n t peneyratio groove weld is required points toward Eff.y-yy\ LlllVdl\ be.plepared / L- length of increments STAGGERED I N T E R M I T T E R F I L L E T WELDING SYMBOL -Pitch - 26 13-1& WELDING SYMBOL FOR GROOVES W E L D E D FR-OM BOTH SIDES W I T H BACKGOUGING - Only depth of preparation is required in the weldingsymbol (distance between increments Size (length of leg) incremen ts Pitch (distance between centres) o f welds of countersink (d~arm. D1. Stud Welding Symbol Arrow points to the surface to which the stud is to be welded. 27 PLUG WELDING SYMBOL 20 S L O T WELDING SYMBOL BACK-WELDING SYMBOLS Any single-groove weld with a pass f r o m the Other side w i t h n o special identification i n the tail is considered a groove weld w i t h a back weld. Their effective throat is stated separately. D1.6 Materials for Backing and Spacers S Single V-groove with steel (S)\* backing S Double V-groove with steel (S)\* spacer \*The following letters may be used as applicable: S R T F C - steel or other material as specified - same as S but removed after welding - tape - flux - ceramic Note: This symbolization is specific to CSA Standard W59. GTSM: Gouge To Sound Metal CP - Complete Penetration PP - Partial Penetration See Clause D1.6. W59-M1989 January, 1989 Appendix D - Welding Symbols 1 1 BASIC W E L D I N G SYMBOLS W M D TWEIR LOCATION SIGNIFICANCE S I N G L E - V - G R O O V E WELDING SYMBOL A I Size (length of leg) . Any single groove weld with a pass from one side identified in the tail by "backing weld" is considered to be a groove weld with a backing weld. Joint with Backing 4. (2) The location of the first and last arc spot weld in each single line shall be specified on the drawing. When GTSM is specified in the tail of the symbol, such gouging on the second side shall be to sound metal. " R " indicates backing removed after weldina See Clause D1.6 C-Chipping G-Grinding M-Machining JOINT W I T N SPACER R - Rolling H - Hammering I ABBREVIATIONS W t h m o d i f i e d groove-weld symbol NOTES eEtes - A r r o w of welding symbol Double-bevel symbol - Material (M) and dimensions of spacer as specified. 186 August 2003 © Canadian Standards Association Welded Steel Construction (Metal Arc Welding) Location of Elements of a Welding Symbol Finish symbol Contour symbol F A R Specification; process; or other reference T Tail (omitted when reference not used) S (E) (Both sides) Effective Throat Depth of preparation; size for certain welds Other ( Arrow side ) ( side ) Groove angle; included angle of countersink for plug welds Basic weld symbol or detail reference Basic Welding Symbols and Location Significance Reference line Length of weld Pitch (centre-to-centre spacing) of welds Weld-all-around symbol L-P Arrow connecting reference line to arrow-side member of joint Supplementary Symbols Field Weld Backing, MeltSpacer, or Through Consumable Insert Contour Flush Convex Concave Other Side Groove Weld Symbol Both Sides No Arrow Side or Other Side Significance Arrow of welding symbol Arrow side of joint Not Used Where letter designations of processes are to be used in the tail of the welding symbol, they shall conform to Table 1. "Letter Designations of Welding and Allied Processes and Their Variations of AWS A2.4-98" Flag points away from the arrow (W59 recommendation) Other side of joint 8. Basic Joints — T-Joint Back or Backing Groove Weld Symbol 6. and all dimensions other than depth o f f i l l i n g as shown on the draw i n ^ 22 F L A R E - V AND F L A R E - B E V E L - G R O O V E WELDING S Y M B O L S Effect--vethroat Welded Steel Construction [MetalArc Welding] January, 1989 SA W E C L K D I N G OR 29 I preparation and effective throat indicates complete 10Itpenetration is required. Basic Joints — Edge Joint Not Used Not Used Not Used Not Used When used without a surface finish symbol, it indicates weld without subsequent finishing. Welding Symbols for Grooves Welded from Both Sides with Back-Gouging GTSM Included angle of countersink Omission of depth of preparation and effective throat indicates complete joint penetration is required. Depth of filling (omission indicates filling is complete) 80 21. Multiple Reference Lines Second operation, or supplementary data Third operation, or test information 15. 22. hmtration Ed\* WMing Symbol lcdkxtes mmplete Jant penetrahon ragerdlss of hipe 01 weM or pint pmparallon 2nd operaeon Weld 3rd operatm f 8128 Fluhor Upad Weldtng Symbol awt-T-NSymbol Joint with Bolding Process reference Root rnmforcement \* Joint rvlth Spscsr ~ r u contour h Symbol 'R' ~ndmtesW n g removed after wMng Convex Cantour Symbol With modified groove weld symbol Double bwel gmove 'H should be understood that these charts are intended only as shop aids. Alternatively, the convention of the Contractor identifying clearly to the Engineer all groove welds requiring such back-gouging operations may be used on the drawings, thus qualifying them as complete joint penetration groove welds. W = weld face width (E) W Note: This welding symbol is specific to CSA Standard W59. Weld-all-around symbol indicates that weld extends completely around the joint Arrow of welding symbol 3. Square Groove Welding Symbols For square groove the depth of preparation is omitted in the symbol (4) Effective throat Root opening 5 100 (8) Pitch Number of studs 30. 12 1 Diameter Root opening Root opening 23. t - Stagwvl ltwmlbnt FILM W n g Symbol Prch (diatma PWI (distance between wntem) of incremental CmlWon of length Indicator hat. - I C b l n Int.mttrmla I M Wmlndng Symbol DoubtFILM Wmlndng Sybd Ske ( I s m DI 1 ~ ) - imlsrenb Rack Wmlndng Symbol wsd d amnds between abuptchsnpl In dlnktm w aa d l m s M i d Plug Wldng Symbol Size ( I e r n o f IW) B.cldna Wmlndno Bymbol Includeddang of Stu, ldnhter ( 1 ~ , 1 Depth of Rlln In Inches fnng .i-eta) 1 ~ p o WWng r symbol stud wotlting symbol Increment Slu or Number d studs Size SqWm--ow Wmlndng Symbol pmss Squaw-V-OmowW i n g Symbol Doub-EovmMrww WMing Symbol Weld size Depth 0Ibevel Weld See G m e angle WeM size 1 I Symbol with B.cWunlna I I Fkn-V-Omw Woldlna Symbol AmM points toward member to be ~rspered I Fkw-Bevrl-Qroow Wmlndng Symbol Depm of Muklpb Rofanna Unn 1st oprabon on lln nearest arrow Compkt. Their effective throat is indicated in the respective welding symbol. 12. Staggered Intermittent Fillet Welding Symbol 12 12 Pitch - distance between centres of increments 75-125 75-125 Weld size (length of leg) 20. Plug Welding Symbol 16 OR First operation 28. Flush Contour Symbol Other side of joint 2. Melt-Through Symbol Other side of joint Size (height) -Omission indicates no special height desired 9. D1.3.2 Square groove welds in joints welded from both sides\*, for which the symbol shows neither the depth of preparation "S" nor the effective throat "T", are complete joint penetration groove welds. Back-Welding Symbols Pitch - distance between centres of welds 025 Only depth of preparation is required in the welding symbol GTSM signifies total effective throat is equal to the thickness of material. Backing Welding Symbols Pitch - distance between centres of welds Slot width 28 10 Any single groove weld with a pass from the other side with no special identification in the tail is considered a groove weld with a back weld. (2) The location of the first and last stud weld in each single line shall be specified on the drawing. Flare-V and Flare-Bevel Groove Welding Symbols Flare-V (6) Flare-Bevel 2 Effective throat Effective throat (3) 29. Second operation OR Depth o f filling i n m m i o m ~ s s ~ oindicates n f i l l i ~ n g i s complete) 28 First operation BACKING W E L D I N G SYMBOLS Any single-groove weld w i t h a pass f r o m one side identified i n the tail by "backing weld" is considered t o be a groove weld w i t h a backing weld.



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