NO.	DATE	BY	JO/EWO	DESCRIPTION
03	JUN92	ESSD JVV		DRAWING DIGITIZED INTO CADD DATABASE WITHOUT CHANGES

REVISIONS

DRAWN BY _____ DATE _____
CHKD. BY _____
OPRG. DEPT. BY _____ DATE _____
ENG. DEPT. BY _____ DATE _____
APP'D. FOR CONSTR. BY _____ DATE _____
CERTIFIED BY _____ DATE _____

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR FOR ORDERING MATERIAL UNTIL CERTIFIED AND DATED.

SAUDI ARABIAN OIL COMPANY

HOW TO USE THE PREHEAT CURVES

FIRST : DETERMINE THE FOLLOWING INFORMATION

(1) WELDING PROCESS TO BE USED.

(2) WELDING HEAT INPUT IN KILOJOULES PER INCH OF WELD FOR THE SELECTED PROCESS. (THIS CAN BE CALCULATED BY USING THE FORMULA ON SH. 001, THE TABLE OF TYPICAL HEAT INPUT VALUES ON SH. 003, OR THE TABLE FOR FIELD DETERMINATION OF HEAT INPUT VALUE FOR WELDING DONE WITH MANUAL ELECTRODES ON SH. 004).

(3) THE CARBON EQUIVALENT OF THE STEEL BEING WELDED. (OBTAINED EITHER FROM THE MILL SHEETS SUPPLIED WHEN THE STEEL WAS PURCHASED OR FROM THE TABLE "C.E. VALUES FOR USE WHEN ACTUAL VALUES ARE NOT KNOWN" ON SH. 003).

(4) THE COMBINED THICKNESS IN INCHES OF THE PIECES BEING WELDED. (SEE THE EXPLANATION ON SH. 003).

SECOND : USE THIS INFORMATION TO DETERMINED THE REQUIRED PREHEAT TEMPERATURE FROM THE GRAPHS ON SH. 001 AS ILLUSTRATED IN THE EXAMPLE BELOW.

EXAMPLE : WHAT IS THE PREHEAT REQUIREMENT TO BUTT WELD 3/4 INCH WALL THICKNESS PIPE WITH C.E.=0.41? WELDING WILL BE DONE WITH 5/32 INCH DIA. E-6010 (CELLULOSIC) ELECTRODES. ON-SITE WELDING CURRENT AND VOLTAGE ARE NOT KNOWN.

STEP 1. SINCE ON-SITE WELDING PARAMETERS ARE NOT KNOWN, THE HEAT INPUT VALUE IS OBTAINED FROM THE TABLE OF TYPICAL VALUES ON SH. 003. FOR 5/32 INCH DIA. CELLULOSIC ELECTRODES, THIS IS 20 KJ/IN.

STEP 2. ENTER THE RIGTH-HAND GRAPH ON SH. 001 AT 20 KJ/IN AND DRAW A VERTICAL LINE UPWARDS UNTIL IT INTERSECTS THE CORRECT COMBINED THICKNESS LINE. USING THE GUIDE ON SH. 003, THE COMBINED THICKNESS FOR A 3/4 INCH THICK BUTT WELD IS C.T. = t1+t2+t3 = 3/4 + 3/4 + 0=1.5. DRAW A HORIZONTAL LINE FROM THIS POINT OVER TO THE LEFT HAND GRAPH.

STEP 3. ENTER THE BOTTOM OF THE LEFT HAND GRAPH AT C.E.=0.41 USING SCALE "A" BECAUSE CELLULOSIC ELECTRODES WERE SPECIFIED. DRAW A VERTICAL LINE UPWARDS UNTIL IT INTERSECTS THE HORIZONTAL LINE DRAWN IN THE PRECEDING STEP. THIS INTERSECTION FALLS ON THE 200°F PREHEAT LINE. THE CORRECT PREHEAT FOR THIS SITUATION IS, THEREFORE 200°F.

NOTE:

1. GENERAL REVISION OF AD-036451-0 & AD-036452-0 THAT COMBINES THESE TWO, FORMERLY SEPARATE DRAWINGS INTO ONE DRAWING. CHANGED DRAWING SIZE FROM "D" TO "E".

DRAWING TITLE	PLANT NO.	INDEX	DRAWING NO.	SHT. NO.	REV. NO.
PREHEAT LEVELS FOR WELDING CARBON STEELS (INCLUDES LOW HYDROGEN PROCESSES)	990	W	AE-036451	002	03
STD. DWG.	JO/E NO-				

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