

# **Weld Pad Gages**

## **Series RMW TMW**



**PENBERTHY®**

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## 1. Introduction

From its beginning in 1886 with the boiler feedwater injector to present-day ISO 9001 certification, Penberthy has utilized advanced technology to anticipate customer needs and solve problems. Many years of research and development, lab and field product testing, and product performance monitoring have resulted in a superior product line used in oil and gas production, transportation, refining, petrochemical, chemical, and power generation industries

## 2. Warranty

Clark-Reliance warrants its manufactured goods as being free from defects in material and workmanship for one (1) year from the date of shipment. If any of the goods are found by the seller to be defective, such goods will be replaced or repaired at the seller's cost. Refer to Clark-Reliance's Terms & Conditions for full warranty details.

## 3. About This Manual

This manual is designed to aid and guide in the installation, operation, and maintenance of the Penberthy RMW & TMW family of weld pads. Authorized personnel must read and understand all instructions before attempting to install, operate, or maintain this equipment. Only persons certified to perform work described herein should attempt any actions suggested. Safety precautions and company safety standards should be adhered to at all times when performing the activities described in this manual.

## 4. Inspection and Delivery

Upon receiving weld pad gages, check all components carefully for damage incurred during shipping. Sign for the shipment noting "damaged" and immediately notify the shipping firm of any such damage and request damage inspection. Confirm that the product model number, and pressure / temperature ratings (on nameplate) meet application specifications. Also confirm that the material of construction is compatible with both the process fluid and surrounding atmosphere.

**CAUTION:** *Penberthy weld pad gages are not to be used for gaging lethal substances as defined by ASME Section VIII*

## 5. Product Description

Penberthy weld pads are an economical means for level indication. The pad of the gage is welded directly to the outer shell, becoming integral with the wall of vessel. The pad can come machined with either a vision slot (standard with transparent glass) or 2-Hole design (standard with reflex glass) (Figure 1). As an option, the pad can also be machined with a radius to conform to the vessel outer diameter. Weld pads are generally used for non-critical applications because the process must be shut down for gage maintenance or replacement.

# Penberthy Weld Pad Gages

## 6. Selection Guide

### Selection Guide

<b>Example:</b>		1	RMW	3	C	C	C	X	F	X	X	X	X	G	S	X	X	X
<b>No. of Sections</b>																		
1	1 Section																	
2	2 Section																	
3	3 Section																	
4	4 Section																	
<b>Gauge Type</b>																		
RMW	Weld Pad Reflex Gauge																	
TMW	Weld Pad Transparent Gauge																	
<b>Glass Size</b>																		
1	Size 1																	
2	Size 2																	
3	Size 3																	
4	Size 4																	
5	Size 5																	
6	Size 6																	
7	Size 7																	
8	Size 8																	
9	Size 9																	
<b>Wetted Parts Material (chamber)</b>																		
C	Carbon Steel (standard)																	
S	316/316L Stainless Steel																	
<b>Cover Materials</b>																		
C	Carbon Steel (standard)																	
S	316/316L Stainless Steel																	
<b>Bolting Material</b>																		
C	STL A193 B7/A194 2H (standard)																	
S	SST A193 B8M/A194 8M																	
<b>NACE MR-01-75 &amp;/OR MR-0103</b>																		
X	None																	
W	NACE Wetted																	
E	Environmental																	
<b>Chamber Type</b>																		
F	Flat Pad (standard)																	
R	Radius Pad (specify)																	

# Penberthy Weld Pad Gages

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## Selection Guide - Part 2

**Example:** 1 RMW 3 C C C X F XXXX G G S X X X

**Tank Radius (1/2 Tank DIA 2-12)**

XXXX None

0000 Inches (first 2 digits = whole inches,  
last 2 digits = fraction of an inch in

### Gasket Material

S Grafoil/SS Insert

T Gore Gr (ePTFE)

A Garlock 5500

### Cushion Material

S Grafoil/SS Insert

A Garlock 5500

### Paint Specification

X None

S Standard

### Option 1

X None

B Mica Shields V-4

C PCTFE Shields (Kel-F)

D Mica Shields V-2

### Option 2

X None

### Option 3

X None

## 7. Welding Instructions

Weld pad gages are shipped loosely assembled (bolting finger tight) and should first be entirely dismantled. Place the pad in the desired location on the vessel so that it can be used as a template for drilling holes or to cut the vision slot.

For 2-Hole style pads, drill a hole at the top and bottom of the visible slot. The hole diameter should be 5/8" [15mm] to match the pad.

For vision slot style pads, the slot should be cut through the wall of the tank. If internal welding is to be performed, the width and length of the slot can be increased by chalking a second cutout line 1/4" [6mm] outside the scribed line. This will provide a suitable shelf on which to lay the bead as shown in Figure 2.

To avoid buckling, the pad should be tack welded at intervals, both internally and externally, in accordance with recognized welding procedures before placing the continuous welds.

As an added precaution against distortion, the weld pad gage can be assembled without gaskets, using a steel spacer instead of the glass inserts. This spacer can be cut from bar stock 1-1/4" x 3/4" [31mm x 19mm]. Its length will be determined by the length of the gasket recess. This procedure will increase the rigidity of the pad and minimize the possibility of distorting the glass seating surface during welding. These spacers are also available for purchase (see spare parts section).

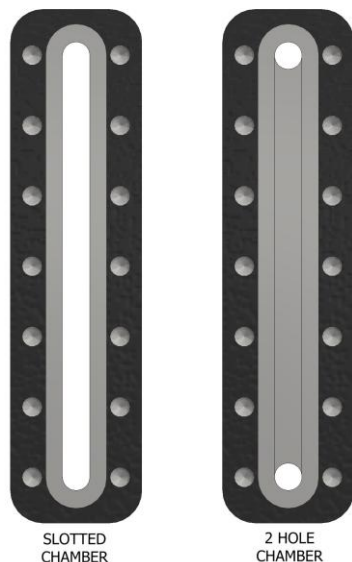


FIGURE 1

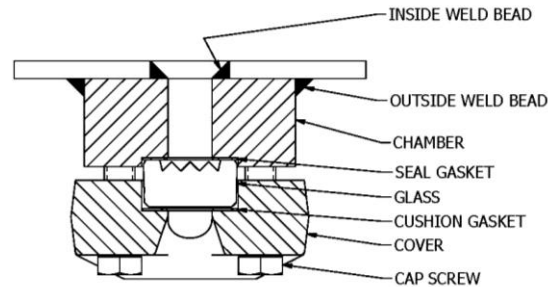


FIGURE 2

### **CAUTION:**

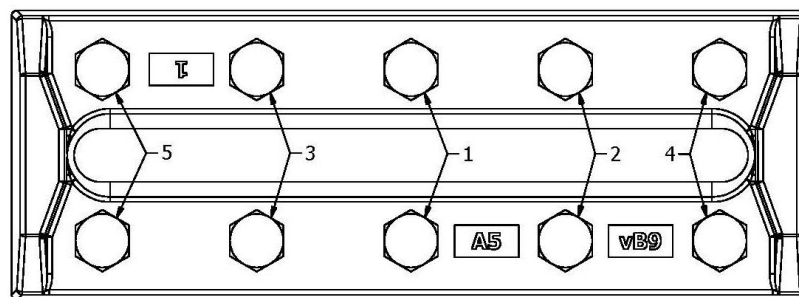
**Pressure Loads:** Where it is necessary to slot the tank because of the nature of the liquid, or there is need to observe the color or interface of the liquid, the following facts must be considered: Standard weld pad gages will withstand loadings due to the pressure within the gage itself, but they are not designed to replace the tank strength lost when the tank wall is cut. The gage manufacturer has no control over the loading which the pressure vessel will impose on the pad. It is therefore impossible to rate weld pad gages. The tank fabricator must provide suitable tank wall reinforcement to prevent the pad from being distorted during weld or while under operating conditions. The user is responsible for performing pressure vessel calculations to determine if acceptable for ASME Sec. VIII.

## 8. Assembly Instructions



**FIGURE 3**

Assemble the weld pad as shown in the exploded view of Figure 3. The glass and gaskets should be centrally located within the recessed seat of the pad to avoid glass-to-metal contact. Take note of the seal and cushion gasket material to confirm the correct material is used for each respective gasket in configurations where the materials differ. Tighten the bolts finger-tight working from the middle set and alternating outward (see Figure 4 below). Next, tighten with a torque wrench in the same sequence in 5 ft.-lb (6.7 N-m) increments until final torque value of 15 ft.-lbs (20.3 N-m) is achieved.



**FIGURE 4**

## 7. Spare Parts

Part#	Material	Description
V16756-X	Tempered Borosilicate	Transparent Glass
V16757-X	Tempered Borosilicate	Reflex Glass
V19980-X	Inorganic Fiber with Nitrile Binder	Garlock IFG 5500
V13143-X	SS Reinforced Graphite	Grafoil
V20610-X	ePTFE	Gore GR
V2M-X-A5	Carbon Steel	Gage Covers
V438-X-TL2	316SS	Gage Covers
P2442-X-A6	Carbon Steel	Steel Spacer for Welding

Note: Replace “X” in all Part Numbers with the Glass Size