



International Association of
Geosynthetic Installers

Renewal Process
for the Certified Welding Technician (CWT)
Program / Polyethylene



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Table of Contents

Steps for CWT Renewal	3
Checklist for Renewal	4
Rules for Third-party Observer	5
Renewal Application	6
Guidelines for the Hands-on Test	7
GM 19	9

Introduction:

The International Association of Geosynthetic Installers' **CWT Renewal Manual** has been developed to ensure that the renewal process is administered uniformly. Please follow all the guidelines as written in this manual.

IAGI is continually working to enhance this certification program. If you have suggestions for improving this process, please contact IAGI's Managing Director at +1 (720) 353-4977 or iagi@iagi.org.

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Physical address:

IAGI

8357 N. Rampart Range Road, Unit 106

PMB# 154

Roxborough, CO 80125 USA

Telephone: + 1 (720) 353-49775

Fax: +1 (612) 235-6484

E-mail: iagi@iagi.org



Steps for CWT Renewal:

The CWT renewal process has been updated in 2012. Now each CWT must submit one field-welded polyethylene sample for each seam type subject to renewal, made in the presence of a third-party observer, to an approved independent laboratory for testing. IAGI suggests asking a third-party on a job site to oversee this process. The qualifications for a third-party observer are listed on page 5 of this manual.

The renewal process is as follows:

1. Submit CWT renewal order form and renewal fee of \$95 USD (per renewal). This price includes fees for the laboratory tests.
2. Fill out the renewal form.
3. Provide a resume showing 500,000 square feet (45,000 meters squared) welded within the past five years.
4. Submit one field-welded polyethylene sample for each seam type subject to renewal, made in the presence of a third-party observer, to one of the two approved independent laboratories. (see page 8)
5. Have third-party observer sign off on renewal form.
6. The renewal will be processed and successful CWTs will have their certification renewed for another five (5) years. A new wallet card and certificate will be sent to them.



Checklist for renewal

The CWT Renewal Process for CWTs requires a renewal application, resume, field welded sample(s), and renewal fee. The following is a checklist of items needed for renewal:

Checklist for renewal:			
✓	<i>Requirements</i>	<i>Responsible party</i>	<i>Notes:</i>
	Renewal fee paid	CWT candidate/ company	CWT Candidate/company to send directly to IAGI. IAGI will then provide a PO Number needed for the application.
	Renewal Application completed	CWT candidate	Be sure the PO Number received from IAGI is filled in on the application.
	Resume showing 500,000 square feet of seam welding	CWT candidate	Candidate to send directly to IAGI. (info@iagi.org)
	Field-welded sample(s) supervised by third-party witness	CWT candidate	One field welded extrusion weld sample and/or one field welded wedge weld sample.
	Signed renewal application	Third-party observer & CWT candidate	One copy is sent to test lab with field welded sample(s) and one copy is sent to IAGI. <u>Be sure the PO Number received from IAGI is on this form.</u>
	Field-welded sample submitted	Third-party witness	Send directly to laboratory with a copy of the signed renewal application. Shipping is at the expense of the CWT candidate / company.



Rules for Third-party observer:

1. The third-party observer is neither employed by nor has a financial interest in the company where the welding technician is employed.
2. The third-party observer is responsible for checking that the individual taking the exam is also the individual listed on their government issued identification.
3. The third-party observer ensures that only the individual taking the exam makes the weld(s).
4. The third-party observer must provide complete contact information in the event IAGI needs to verify the authenticity of the submission.
5. The third-party is **NOT** responsible for certifying the quality of the weld(s), the proper material usage or equipment suitability. This is the sole responsibility of the technician.
6. Test candidates may test the strength of the weld(s) prior to submission using a field tensiometer. Candidates may weld a total of three samples and choose the one that they want to submit. No other party can influence the candidates decision about which seam should be submitted.
7. Any compensation for this service is privately negotiated between the CWT candidates and the third party. IAGI does not set or recommend rates for this service.

RENEWAL APPLICATION



Third party Information:

Third party observer's name:			
Company Name:			
Address: (no PO Boxes)			
City:		Province/ State:	
Postal Code / Zip Code:		Country:	
Telephone:		Fax:	
e-mail:			
Notes:			
<p>I attest that the welding technician listed on this application has shown me a government issued identification, has performed the weld(s) by himself/herself and has submitted the sample(s) directly to me.</p>			
Signature:			

CWT Applicant Information:

Date of Weld(s):	Wedge Weld HDPE _____mil	Wedge Weld LLDPE _____mil	Extrusion Weld HDPE _____mil	Extrusion Weld LLDPE _____mil
CWT Renewal Applicant:				
Company Name:				
Address: (no PO Boxes)				
City:		Province / State:		
Postal Code / Zip Code:		Country:		
Telephone:		Fax:		
e-mail:				
Company Contact: (person IAGI can contact with questions.)				
Company contact e-mail:		Company Contact telephone:		
Notes:				
<p>I attest that I made the weld(s). I further attest that I am responsible for the selection of material, selection of equipment, I have welded a minimum of 500,000 square feet of geomembrane in the field over the past 5 years, and I have completed this renewal in compliance with the rules of the CWT program.</p>				
Signature:	<div style="border: 1px solid black; padding: 5px; display: inline-block;">PO Number from IAGI:</div>			

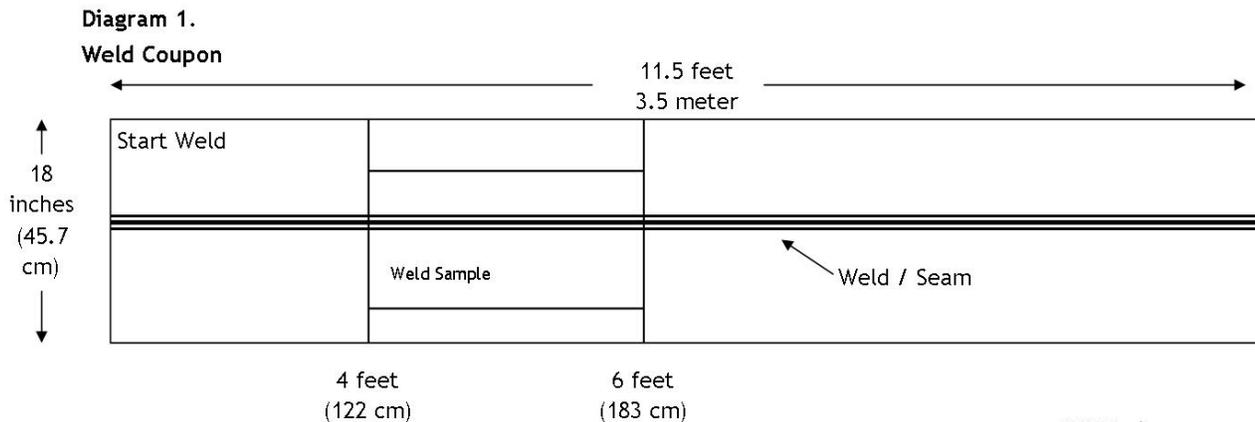
Send one copy of this page to IAGI; One copy of this page to the laboratory with seam sample



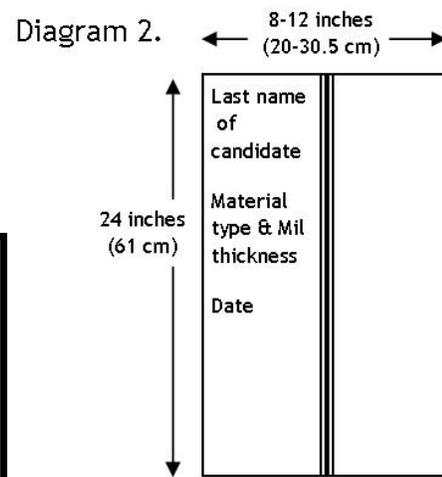
Guidelines for the Hands-on Test

Each candidate can re-weld up to 3 (three) times:

The candidate may seam up to three welds and then choose the best sample to submit. Once the candidate is ready to submit his/her sample(s), have them cut a sample per diagram 1 (below). The submission weld sample(s) should be trimmed to approximately 8-12 inches wide by 24 inches long. The seam will run parallel with the 24-inch edge. Have the candidate label the submission weld sample(s) as described in diagram 2. Place the sample(s) in an envelope / sandbag and send to the laboratory for testing. Also, label the envelope / sandbag with the test candidate's full name and note it is IAGI Certification Renewal Testing.



Cut the submission weld sample starting at the four (4) foot mark. This allows for a temperature drop and recovery period on fusion welds.



NOTE: In some companies the welding technicians do not run the field tensiometer. It is acceptable for the quality control person to run the tests. The QC person can only report the value (number) the specimen pulled on the tensiometer. The QC person cannot indicate "pass or fail" to the candidate. It is responsibility of the test candidate to determine if the strength of the weld and / or mode of failure is acceptable for submission. The third-party observer must monitor the QC person for compliance if this method is used. If the QC person states to the test candidate "pass or fail," then the weld cannot be submitted.

All welds will be graded in accordance with GM19 (see pages 9–10 for the tables)



Guidelines for the Hands-on Test

Lab selection:

The test candidate or candidate's company can choose the testing laboratory that will perform the destructive testing of submitted samples from the following approved list. Send all labeled materials to one of the labs below and write the name of the sponsoring company on the box and internal packing labels. Indicate that this shipment is for IAGI CWT Renewal exams for Polyethylene.

SAGEOS
Contact: Eric Blond
3000 Boullé Street
Saint-Hyacinthe, QC J2S 1H9
Canada
Phone: + 450 778-1870

TRI/Environmental
Contact: Sam Allen
9063 Bee Caves Road
Austin, TX 78733
USA
Phone: + 512-263-2101

Table 2(a) – Seam Strength and related Properties of Thermally Bonded Smooth and Textured Linear High Density Polyethylene (HDPE) Geomembrane (English Units)

Geomembrane Nominal Thickness	30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils
Hot Wedge Seams ⁽¹⁾ shear strength ⁽²⁾ , lb/in. shear elongation at break ⁽³⁾ , % peel strength ⁽²⁾ , lb/in. peel separation, %	57	80	100	120	160	200	240
	50	50	50	50	50	50	50
	45	60	76	91	121	151	181
	25	25	25	25	25	25	25
Extrusion Fillet Seams ⁽¹⁾ shear strength ⁽²⁾ , lb/in. shear elongation at break ⁽³⁾ , % peel strength ⁽²⁾ , lb/in. peel separation, %	57	80	100	120	160	200	240
	50	50	50	50	50	50	50
	39	52	65	78	104	130	156
	25	25	25	25	25	25	25

Notes for Tables 2(a) and 2(b):

1. Also for hot air and ultrasonic seaming methods
2. Value listed for shear and peel strength are for 4 out of 5 test specimens; the 5th specimen can be low as 80% of the listed values
3. Elongation measurements should be omitted for field testing

Table 2(b) – Seam Strength and related Properties of Thermally Bonded Smooth and Textured High Density Polyethylene (HDPE) Geomembrane (S.I. Units)

Geomembrane Nominal Thickness	0.75 mm	1.0 mm	1.25 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
Hot Wedge Seams ⁽¹⁾ shear strength ⁽²⁾ , N/25mm shear elongation at break ⁽³⁾ , % peel strength ⁽²⁾ , N/25mm peel separation, %	250	350	438	525	701	876	1050
	50	50	50	50	50	50	50
	197	263	333	398	530	661	793
	25	25	25	25	25	25	25
Extrusion Fillet Seams ⁽¹⁾ shear strength ⁽²⁾ , N/25mm shear elongation at break ⁽³⁾ , % peel strength ⁽²⁾ , N/25mm peel separation, %	250	350	438	525	701	876	1050
	50	50	50	50	50	50	50
	170	225	285	340	455	570	680
	25	25	25	25	25	25	25

Table 3(a) - Seam Strength and related Properties of Thermally Bonded Smooth and Textured **Linear Low Density Polyethylene (LLDPE) Geomembrane (English Units)**

Geomembrane Nominal Thickness	20 mils	30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils
Hot Wedge Seams ⁽¹⁾ shear strength ⁽²⁾ , lb/in. shear elongation at break ⁽³⁾ , % peel strength ⁽²⁾ , lb/in. peel separation, %	30 50 25 25	45 50 38 25	60 50 50 25	75 50 63 25	90 50 75 25	120 50 100 25	150 50 125 25	180 50 150 25

Notes for Tables 3(a) and 3(b):

1. Also for hot air and ultrasonic seaming methods
2. Value listed for shear and peel strength are for 4 out of 5 test specimens; the 5th specimen can be low as 80% of the listed values
3. Elongation measurements should be omitted for field testing

Table 3(b) - Seam Strength and related Properties of Thermally Bonded Smooth and Textured **Linear Low Density Polyethylene (LLDPE) Geomembrane (S.I. Units)**

Geomembrane Nominal Thickness	0.50 mm	0.75 mm	1.0 mm	1.25 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
Hot Wedge Seams ⁽¹⁾ shear strength ⁽²⁾ , N/25mm shear elongation at break ⁽³⁾ , % peel strength ⁽²⁾ , N/25mm peel separation, %	131 50 109 25	197 50 166 25	263 50 219 25	328 50 276 25	394 50 328 25	525 50 438 25	657 50 547 25	788 50 657 25