



INDUSTRIAL FRP FIELD REFERENCE / 2026 FIELD EDITION

FRP TANK INSPECTION FIELD CHECKLIST

A low-ink field companion for planning, external and internal documentation, photograph records, and follow-up.

The illustration shows a white rectangular card with rounded corners. At the top, there is a large circle containing the number '99' in a bold, blue font. Below the circle, the text 'CONDITION CHECKLIST' is written in a smaller, blue, sans-serif font. At the bottom of the card, there are three horizontal lines, each preceded by a small square checkbox.

Presented by Plastech Services, Inc.

www.plastechservices.com

(410) 737-4700

EDUCATIONAL PLANNING AND DOCUMENTATION AID

TANK INFORMATION

Record the asset, materials, service, and inspection objective.

Use additional sheets or the editable XLSX workbook when a field needs more space.

FACILITY AND AREA

TANK ID AND ASSET NUMBER

TANK TYPE AND ORIENTATION

MANUFACTURER / MODEL / SERIAL

YEAR MANUFACTURED / INSTALLED

CAPACITY / DIAMETER / HEIGHT OR LENGTH

RESIN AND LAMINATE, IF KNOWN

CORROSION BARRIER OR LINER

CURRENT PRODUCT AND CONCENTRATION

OPERATING AND MAXIMUM TEMPERATURE

PRESSURE / VACUUM / VENTING

PIPING, SUPPORTS, VALVES, AND EQUIPMENT

PRIOR INSPECTIONS / REPAIRS / RELINING

KNOWN EXCURSIONS OR EVENTS

INSPECTION OBJECTIVE

QUALIFIED REVIEW CONTACT

PRE-INSPECTION PLANNING

Assemble records and coordinate the facility work.

This checklist supports planning and documentation. It does not authorize entry or establish an inspection or safety procedure.

- ☐ Manufacturer drawings, data, laminate information, and instructions
- ☐ Product, concentration, temperature, pressure, vacuum, and venting history
- ☐ Prior inspection, photograph, repair, reline, and condition-map records
- ☐ Nozzle, piping, support, foundation, anchorage, and change records
- ☐ Operations and EHS contacts assigned
- ☐ Tank operating state and product hazards confirmed by the facility
- ☐ Access, lighting, weather, working-at-height, and surrounding hazards reviewed
- ☐ Photography restrictions and documentation method reviewed
- ☐ Required permits and authorizations identified
- ☐ Inspection methods and acceptance basis assigned to qualified personnel

PAGE NOTES / PHOTO IDS / FOLLOW-UP

EXTERNAL WALKDOWN

Follow a repeatable route from the surroundings to the roof.

Begin with the surrounding area and support condition, then document the tank from bottom to top. Include connections, attachments, prior repairs, and connected piping. Record what is visible without assuming a cause or structural significance.

- ☐ Standing liquid, staining, deposits, or product in secondary containment
- ☐ Foundation cracking, settlement, unevenness, or support voids
- ☐ Tank tilt, movement, uplift, or flotation evidence
- ☐ Damaged anchors, lugs, saddles, skirts, or hold-downs
- ☐ Corroded, loose, or missing metallic hardware
- ☐ Color change, staining, fading, chalking, or loss of gloss
- ☐ Fiber blooming, fiber prominence, or exposed glass
- ☐ Crazeing, matrix cracks, larger shell cracks, or whitening
- ☐ Scratches, gouges, cuts, grinding, impact, or crushing
- ☐ Blisters, bubbles, porosity, or voids
- ☐ Delamination, hollow areas, or disbonded secondary laminates
- ☐ Chemical spill or vapor exposure
- ☐ Softness, resin loss, unusual roughness, or abnormal surface texture

PAGE NOTES / PHOTO IDS / FOLLOW-UP

EXTERNAL WALKDOWN

Follow a repeatable route from the surroundings to the roof. / continued

Continue the same route and documentation method. Record location, photographs, extent, comparison, and follow-up for every observed condition.

- ☐ Wrinkles, waviness, print-through, or geometric irregularity
- ☐ Bulging, out-of-roundness, buckling, or creep deformation
- ☐ Nozzle-to-shell or manway-to-shell cracking
- ☐ Nozzle-neck or flange laminate cracking
- ☐ Leakage, seepage, staining, or deposits at a connection
- ☐ Flange-face damage, forced fit-up, or gasket-related leakage
- ☐ Unsupported pipe, valve weight, misalignment, vibration, or thermal movement at a nozzle
- ☐ Cracking or movement at ladders, platforms, handrails, mixer mounts, or roof attachments
- ☐ Condition of repairs, patches, and exterior overlaminates
- ☐ Roof cracking, deformation, or collapse
- ☐ Evidence of pressure or vacuum damage
- ☐ Wind, flood, freeze, heat, fire, or seismic damage
- ☐ Active through-wall leakage or severe deformation

PAGE NOTES / PHOTO IDS / FOLLOW-UP

INTERNAL INSPECTION PLANNING

Document internal conditions only within the facility's approved program.

Qualified personnel select inspection methods and direct the inspection. Record authorized observations in a consistent route from the access opening to the roof, shell, knuckle, bottom, nozzles, internals, and prior repairs.

Important

Internal inspection begins with the facility's authorization and control of the work. The owner or operator determines the operating state, isolation, cleaning, decontamination, access classification, atmospheric evaluation, ventilation, permits, rescue provisions, personal protective equipment, and other requirements. This workbook does not authorize entry and is not an entry permit or safety procedure.

- ☐ Discoloration, deposits, staining, or loss of gloss
- ☐ Roughness, softening, swelling, embrittlement, or other material change
- ☐ Resin loss, veil erosion, corrosion-barrier thinning, or washout
- ☐ Chemical attack, permeation, or absorption indicators
- ☐ Crazeing, pinholes, pitting, matrix cracks, or liner cracks
- ☐ Blisters, blister rupture, bubbles, or porosity
- ☐ Exposed fibers, fiber attack, or fiber-matrix debonding
- ☐ Knuckle cracking or erosion
- ☐ Bottom degradation, cracking, sediment-related wear, or standing residue
- ☐ Drain-neck erosion or degradation
- ☐ Jet impingement opposite an inlet, return, sparger, or mixing device
- ☐ Abrasion, worn tracks, scraping, or cleaning damage

PAGE NOTES / PHOTO IDS / FOLLOW-UP

INTERNAL INSPECTION PLANNING

Document internal conditions only within the facility's approved program. / continued

Continue the same route and documentation method. Record location, photographs, extent, comparison, and follow-up for every observed condition.

- ☐ Liner-to-structure disbondment or peeling
- ☐ Interlaminar delamination
- ☐ Voids, dry glass, incomplete wet-out, resin starvation, or resin-rich areas
- ☐ Wrinkles, folds, bridging, or reinforcement distortion
- ☐ Foreign inclusions or contamination
- ☐ Abnormal cure or hardness indications identified by qualified testing
- ☐ Uneven corrosion-barrier or structural thickness
- ☐ Chemical attack at nozzle bores, flange faces, necks, or transitions
- ☐ Nozzle-to-shell internal bond cracking
- ☐ Nozzle, manway, repad, or transition delamination
- ☐ Manway edge, neck, flange, or internal-surface degradation
- ☐ Abrasion, impact, or cracking from internal hardware, baffles, or mixers

PAGE NOTES / PHOTO IDS / FOLLOW-UP

INTERNAL INSPECTION PLANNING

Document internal conditions only within the facility's approved program. / continued

Continue the same route and documentation method. Record location, photographs, extent, comparison, and follow-up for every observed condition.

- ☐ Structural cracks
- ☐ Fiber fracture
- ☐ Wall thinning or structural-laminate loss
- ☐ Thermal or mechanical fatigue indicators
- ☐ Repair, patch, liner, or relined deterioration
- ☐ Through-wall seepage, leakage, or severe structural change

PAGE NOTES / PHOTO IDS / FOLLOW-UP

99-CONDITION CHECKLIST

External condition reference

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	E1 Exterior discoloration, staining, and loss of gloss	LOCATION / PHOTO / FOLLOW-UP
	Color change, streaks, deposits, or dull patches indicate exposure or aging but do not prove structural damage.	
☐	E2 UV degradation, chalking, and exterior resin weathering	LOCATION / PHOTO / FOLLOW-UP
	Fading, powdery chalk, roughness, and shallow cracks develop in the resin-rich exterior.	
☐	E3 Fiber blooming, fiber prominence, and exposed glass	LOCATION / PHOTO / FOLLOW-UP
	White, threadlike glass becomes visible or raised as surface resin recedes or microcracks.	
☐	E4 External crazing and fine surface cracking	LOCATION / PHOTO / FOLLOW-UP
	A network of fine hairline cracks appears in the exterior resin surface.	
☐	E5 Nozzle-to-shell bond cracking	LOCATION / PHOTO / FOLLOW-UP
	Curved or radial cracks form at the nozzle fillet, secondary bond, or shell transition.	
☐	E6 Nozzle-neck cracking	LOCATION / PHOTO / FOLLOW-UP
	Axial, circumferential, or localized cracks develop in the exposed nozzle neck.	
☐	E7 Nozzle weeping or leakage	LOCATION / PHOTO / FOLLOW-UP
	Dampness, droplets, or a narrow liquid trail appears at the neck, repad, flange, or shell bond.	
☐	E8 Flange leakage	LOCATION / PHOTO / FOLLOW-UP
	Wetness or droplets emerge between mating flange faces.	
☐	E9 Flange-face damage and non-flatness	LOCATION / PHOTO / FOLLOW-UP
	Scratches, chips, cracks, warpage, or an uneven mating gap interferes with gasket seating.	

99-CONDITION CHECKLIST

External condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	E10 Flange laminate cracking or delamination	LOCATION / PHOTO / FOLLOW-UP
	Cracks or separated laminate plies appear in the ring, hub, neck, or transition.	
☐	E11 Improper bolt-torque damage or leakage	LOCATION / PHOTO / FOLLOW-UP
	FRP is crushed or radially cracked below a washer, a gasket is extruded, or compression is visibly uneven.	
☐	E12 Flange misalignment and forced fit-up	LOCATION / PHOTO / FOLLOW-UP
	Pipe and nozzle axes are offset, flange faces meet unevenly, or the pipe appears pulled into position.	
☐	E13 Connected-pipe dead-load damage at nozzles	LOCATION / PHOTO / FOLLOW-UP
	A nozzle sags or distorts, often with whitening or cracking near the loaded side of its bond.	
☐	E14 Thermal-expansion load damage at nozzles	LOCATION / PHOTO / FOLLOW-UP
	Directional nozzle displacement, opposing bond cracks, or localized stress whitening indicates restrained movement.	
☐	E15 Vibration and fatigue damage at nozzles or attachments	LOCATION / PHOTO / FOLLOW-UP
	Multiple short, similarly oriented cracks or a whitening halo develops around a nozzle or attachment.	
☐	E16 External chemical attack from spills, overflow, or vapors	LOCATION / PHOTO / FOLLOW-UP
	A spill path shows bleaching, roughness, softened gloss, resin loss, or exposed fibers.	
☐	E17 Surface scratches, gouges, cuts, and grinding damage	LOCATION / PHOTO / FOLLOW-UP
	Linear scratches or localized gouges remove smooth resin and may reveal pale reinforcement.	
☐	E18 Impact damage, indentation, and crushing	LOCATION / PHOTO / FOLLOW-UP
	A dent, white stress halo, radial cracks, or crushed surface marks a concentrated impact.	

99-CONDITION CHECKLIST

External condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	E19 External matrix cracking and larger shell cracks	LOCATION / PHOTO / FOLLOW-UP
	A distinct crack extends beyond fine surface crazing and may branch across the shell.	
☐	E20 External delamination and hollow areas	LOCATION / PHOTO / FOLLOW-UP
	A subtly raised, whitened, or hollow-sounding area indicates separation between laminate plies.	
☐	E21 Repad or secondary-laminate disbonding	LOCATION / PHOTO / FOLLOW-UP
	An edge lifts from a nozzle pad, manway pad, lug overlay, platform pad, or repair laminate.	
☐	E22 Manway-neck and manway-to-shell cracking	LOCATION / PHOTO / FOLLOW-UP
	Curved or radial cracks appear at the manway neck, fillet, or shell transition.	
☐	E23 Manway flange, cover, gasket, or fastener leakage	LOCATION / PHOTO / FOLLOW-UP
	Wetness emerges at the cover gasket, often near unevenly seated bolts or an extruded gasket.	
☐	E24 Repair-patch or external-overlamine failure	LOCATION / PHOTO / FOLLOW-UP
	A previous patch cracks, peels, blisters, lifts, or differs sharply from the surrounding laminate.	
☐	E25 Dry glass and incomplete wet-out	LOCATION / PHOTO / FOLLOW-UP
	Cloudy white or opaque reinforcement remains visibly under-saturated with resin.	
☐	E26 Voids, air pockets, porosity, and bubbles	LOCATION / PHOTO / FOLLOW-UP
	Small subsurface cavities or larger irregular air pockets interrupt an otherwise continuous laminate.	
☐	E27 Resin-starved or resin-rich areas	LOCATION / PHOTO / FOLLOW-UP
	A matte, fiber-prominent region lies beside a glossy or amber resin pocket, sometimes with shrinkage cracks.	

99-CONDITION CHECKLIST

External condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	E28 Wrinkles, bridging, waviness, and fiber distortion	LOCATION / PHOTO / FOLLOW-UP
	Raised folds, bridged hollows, or distorted fiber paths interrupt smooth laminate geometry.	
☐	E29 Foreign inclusions or laminate contamination	LOCATION / PHOTO / FOLLOW-UP
	Dirt, moisture, wax, dust, or another inclusion is trapped beneath resin, sometimes with a discolored halo or nearby voids.	
☐	E30 Improper cure, low hardness, or exterior softness	LOCATION / PHOTO / FOLLOW-UP
	Uneven gloss, amber color, softness, impressions, burn discoloration, shrinkage cracks, or voids indicate abnormal cure.	
☐	E31 Uneven thickness, thin laminate, or missing reinforcement	LOCATION / PHOTO / FOLLOW-UP
	Local depressions or geometry changes may mark a thin area or absent reinforcement.	
☐	E32 Print-through, waviness, and geometric irregularity	LOCATION / PHOTO / FOLLOW-UP
	Fiber patterns, ripples, or low-amplitude geometry become visible under glancing light.	
☐	E33 Shell deformation, bulging, and out-of-roundness	LOCATION / PHOTO / FOLLOW-UP
	A broad shell quadrant moves outward or loses cylindrical geometry.	
☐	E34 Creep deformation	LOCATION / PHOTO / FOLLOW-UP
	Permanent sagging or smooth long-term bulging appears near sustained shell, nozzle, attachment, or roof loads.	
☐	E35 Mechanical or thermal fatigue cracking	LOCATION / PHOTO / FOLLOW-UP
	Families of short cracks grow near a repeatedly loaded nozzle, attachment, roof transition, or shell zone.	
☐	E36 Foundation settlement and tank tilt	LOCATION / PHOTO / FOLLOW-UP
	The tank leans, one knuckle is compressed, a base gap opens, or piping becomes misaligned.	

99-CONDITION CHECKLIST

External condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	E37 Bottom-support voids or foundation irregularity	LOCATION / PHOTO / FOLLOW-UP
	A localized base gap, washout, debris point, or missing support permits bottom flexure.	
☐	E38 Anchor-lug or hold-down damage	LOCATION / PHOTO / FOLLOW-UP
	Cracked overlays, lifted lug laminates, elongated holes, or damaged bolts appear at a hold-down.	
☐	E39 Ladder, platform, handrail, mixer, and roof-attachment damage	LOCATION / PHOTO / FOLLOW-UP
	Indentation, whitening, cracks, or shifted pads appear around an attachment.	
☐	E40 Corroded, loose, or failed metallic attachments and hardware	LOCATION / PHOTO / FOLLOW-UP
	Metal bolts, clips, supports, or ladder parts show corrosion, looseness, or failure, sometimes staining the FRP.	
☐	E41 Shell buckling or wrinkling	LOCATION / PHOTO / FOLLOW-UP
	Broad circumferential or localized folds alternate inward and outward in the shell.	
☐	E42 Vacuum buckling or implosion	LOCATION / PHOTO / FOLLOW-UP
	The upper shell or roof is pulled inward with broad concave deformation and buckle ridges.	
☐	E43 Overpressure bulging and cracking	LOCATION / PHOTO / FOLLOW-UP
	The upper shell or roof bulges outward and may crack around transitions or fittings.	
☐	E44 Roof cracking or collapse	LOCATION / PHOTO / FOLLOW-UP
	A roof depression, radial cracking, or displaced fitting indicates localized or broad roof failure.	
☐	E45 Wind damage	LOCATION / PHOTO / FOLLOW-UP
	Directional shell or roof buckling, strained anchors, or displaced attachments follows a wind event.	

99-CONDITION CHECKLIST

External condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	E46 Uplift or flotation	LOCATION / PHOTO / FOLLOW-UP
	The base lifts, anchors stretch or fail, and lower piping moves out of alignment.	
☐	E47 Freeze damage	LOCATION / PHOTO / FOLLOW-UP
	A nozzle, drain, jacket, or low point bulges or splits, sometimes with a crack into adjacent laminate.	
☐	E48 Fire, heat, charring, or thermal decomposition	LOCATION / PHOTO / FOLLOW-UP
	Tan-to-black discoloration, charring, blistered resin, distortion, or exposed fibers follows external heat.	
☐	E49 Seismic damage	LOCATION / PHOTO / FOLLOW-UP
	Tank shift, anchor cracking, knuckle whitening, and nozzle or piping misalignment occur in a common direction.	
☐	E50 Nozzle pullout or separation	LOCATION / PHOTO / FOLLOW-UP
	The nozzle bond opens or the connection partially separates, exposing layered FRP edges and radial shell cracks.	
☐	E51 Through-wall shell crack or active shell leak	LOCATION / PHOTO / FOLLOW-UP
	Seepage, a stream, or spray emerges from a crack that crosses the corrosion barrier and structural wall.	
☐	E52 Creep rupture or catastrophic shell rupture	LOCATION / PHOTO / FOLLOW-UP
	A large irregular opening with peeled laminate plies and broken fibers follows rapid structural separation.	
☐	E53 Bottom blowout	LOCATION / PHOTO / FOLLOW-UP
	The bottom or bottom-to-shell joint separates, often with failed anchors and a major release at the base.	
☐	I1 Inner-surface resin attack and normal-to-abnormal resin degradation	LOCATION / PHOTO / FOLLOW-UP
	The resin-rich surface becomes dull, rough, soft, discolored, or locally depleted; normal aging must be separated from progressive damage.	

99-CONDITION CHECKLIST

Internal condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	I2	Chemical attack of the corrosion barrier	LOCATION / PHOTO / FOLLOW-UP
		Whitening, amber discoloration, roughness, pitting, or softening spreads through the veil and resin-rich liner.	
☐	I3	Permeation and chemical absorption	LOCATION / PHOTO / FOLLOW-UP
		Diffuse discoloration, subsurface darkening, swelling, softness, or blistering indicates fluid or vapor movement into resin.	
☐	I4	Veil erosion	LOCATION / PHOTO / FOLLOW-UP
		The smooth surfacing veil is worn away, revealing coarser glass texture below.	
☐	I5	Corrosion-barrier thinning, erosion, or washout	LOCATION / PHOTO / FOLLOW-UP
		A worn channel or broad shallow area shows reduced liner thickness toward the structural laminate.	
☐	I6	Internal discoloration, staining, deposits, and loss of gloss	LOCATION / PHOTO / FOLLOW-UP
		Liquid-level rings, streaks, crystalline deposits, or dull zones record service exposure but may conceal the substrate.	
☐	I7	Crazing and fine inner-surface cracks	LOCATION / PHOTO / FOLLOW-UP
		Dense networks of hairline cracks remain at or near the resin-rich surface.	
☐	I8	Osmotic, chemical, gas, or vapor blistering	LOCATION / PHOTO / FOLLOW-UP
		Intact rounded or elongated blisters rise beneath the liner or inner surface.	
☐	I9	Blister rupture	LOCATION / PHOTO / FOLLOW-UP
		An opened blister has curled resin edges and exposed glass or deeper laminate.	
☐	I10	Internal matrix or resin cracking	LOCATION / PHOTO / FOLLOW-UP
		A distinct crack penetrates farther than crazing but may leave most fibers intact.	

99-CONDITION CHECKLIST

Internal condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	I11 Exposed glass fibers and fiber attack	LOCATION / PHOTO / FOLLOW-UP
	Pale reinforcement becomes visible, etched, softened, or frayed after resin loss.	
☐	I12 Knuckle-radius erosion and cracking	LOCATION / PHOTO / FOLLOW-UP
	Veil loss, scoring, whitening, or cracks follow the internal shell-to-bottom radius.	
☐	I13 Bottom-surface degradation and cracking	LOCATION / PHOTO / FOLLOW-UP
	Dullness, resin loss, deposits, and branching cracks affect the internal bottom.	
☐	I14 Drain-nozzle neck erosion and degradation	LOCATION / PHOTO / FOLLOW-UP
	Directional scoring, thinning, rough resin, or veil exposure affects the drain bore and transition.	
☐	I15 Inlet, return, sparger, or jet-impingement damage	LOCATION / PHOTO / FOLLOW-UP
	A fan-shaped or elongated wear patch forms directly opposite a nozzle or mixing device.	
☐	I16 Internal abrasion	LOCATION / PHOTO / FOLLOW-UP
	Scrape marks, worn tracks, and roughened veil appear on the bottom or lower wall.	
☐	I17 Pitting, pinholes, and localized resin loss	LOCATION / PHOTO / FOLLOW-UP
	Small cavities or porous openings interrupt the inner resin surface.	
☐	I18 Liner cracking	LOCATION / PHOTO / FOLLOW-UP
	A defined crack opens through the corrosion liner while the structural wall may still appear intact.	
☐	I19 Liner-to-structure disbondment and peeling	LOCATION / PHOTO / FOLLOW-UP
	The liner, coating, or reline lifts, curls, flakes, or separates from the structural substrate.	

99-CONDITION CHECKLIST

Internal condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	I20 Interlaminar delamination	LOCATION / PHOTO / FOLLOW-UP
	A raised or hollow area marks separation between internal wall plies.	
☐	I21 Fiber-matrix debonding and stress whitening	LOCATION / PHOTO / FOLLOW-UP
	Diffuse white regions indicate microscopic separation between resin and fibers, often near strain or cracking.	
☐	I22 Dry glass and incomplete wet-out	LOCATION / PHOTO / FOLLOW-UP
	Cloudy white or opaque reinforcement remains insufficiently saturated with resin.	
☐	I23 Voids, air pockets, bubbles, and porosity	LOCATION / PHOTO / FOLLOW-UP
	Irregular subsurface cavities or elongated air pockets interrupt the inner laminate.	
☐	I24 Resin starvation or resin-rich areas	LOCATION / PHOTO / FOLLOW-UP
	Fiber-prominent matte zones or glossy amber resin pockets show an unbalanced resin-to-glass ratio.	
☐	I25 Wrinkles, folds, bridging, and reinforcement distortion	LOCATION / PHOTO / FOLLOW-UP
	Folded fibers, bridged hollows, and resin pockets disrupt the intended laminate path.	
☐	I26 Foreign inclusions and contamination	LOCATION / PHOTO / FOLLOW-UP
	A trapped dark or cloudy inclusion, often with nearby voids, lies beneath the resin surface.	
☐	I27 Improper cure and abnormal Barcol hardness	LOCATION / PHOTO / FOLLOW-UP
	Softness, uneven gloss, amber discoloration, impressions, burn marks, shrink cracks, voids, or delamination indicate abnormal cure.	
☐	I28 Uneven corrosion-barrier or structural thickness	LOCATION / PHOTO / FOLLOW-UP
	The liner tapers abnormally, veil is missing, or structural plies are locally thin.	

99-CONDITION CHECKLIST

Internal condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	I29 Internal nozzle chemical attack	LOCATION / PHOTO / FOLLOW-UP
	The nozzle bore, flange face, neck, or transition becomes rough, discolored, pitted, or veil-exposed.	
☐	I30 Nozzle-to-shell internal bond cracking	LOCATION / PHOTO / FOLLOW-UP
	A crescent crack and radial branches form at the internal nozzle fillet or secondary bond.	
☐	I31 Internal nozzle or manway delamination	LOCATION / PHOTO / FOLLOW-UP
	The neck, repad, transition, or field laminate lifts or separates between plies or from the parent wall.	
☐	I32 Manway internal-surface degradation	LOCATION / PHOTO / FOLLOW-UP
	Scuffing, rough edge sealing, chemical staining, chips, or transition cracking affects the manway interior.	
☐	I33 Internal hardware, baffle, or mixer abrasion and impact	LOCATION / PHOTO / FOLLOW-UP
	Rub tracks, impact marks, whitening, or cracking aligns with a loose or moving internal component.	
☐	I34 Radial, axial, circumferential, or helical structural cracks	LOCATION / PHOTO / FOLLOW-UP
	Larger cracks follow load paths around penetrations, transitions, supports, or principal shell stresses.	
☐	I35 Fiber fracture	LOCATION / PHOTO / FOLLOW-UP
	Broken glass bundles cross a crack or damaged zone rather than remaining continuous.	
☐	I36 Wall thinning and structural-laminate loss	LOCATION / PHOTO / FOLLOW-UP
	A broad internal depression shows loss beyond the corrosion barrier into structural plies.	
☐	I37 Swelling, softening, embrittlement, or dimensional change	LOCATION / PHOTO / FOLLOW-UP
	Resin becomes swollen and soft or dry, brittle, and shrink-cracked, with local dimensional change.	

99-CONDITION CHECKLIST

Internal condition reference / continued

Check only what is visible. Add the precise location, photograph ID, and follow-up in the observation register.

☐	I38 Thermal-shock or thermal-fatigue cracking	LOCATION / PHOTO / FOLLOW-UP
	Closely spaced cracks develop along a temperature-transition zone, often progressing from hairlines to a longer crack.	
☐	I39 Mechanical fatigue cracking	LOCATION / PHOTO / FOLLOW-UP
	Multiple progressively sized cracks and a possible delamination halo appear at a cyclic stress location.	
☐	I40 Internal repair or reline failure	LOCATION / PHOTO / FOLLOW-UP
	A newer patch, coating, or liner blisters, cracks, lifts, peels, disbonds, or leaks.	
☐	I41 Through-wall crack and seepage	LOCATION / PHOTO / FOLLOW-UP
	An internal crack crosses the complete wall and appears externally as a damp spot or slow weep.	
☐	I42 Through-wall leakage	LOCATION / PHOTO / FOLLOW-UP
	A continuous liquid stream passes through a degraded or cracked lower-shell or bottom area.	
☐	I43 Spray or jet leakage	LOCATION / PHOTO / FOLLOW-UP
	Liquid head or pressure drives a narrow energetic release through a hole or crack.	
☐	I44 Overpressure rupture	LOCATION / PHOTO / FOLLOW-UP
	Outward bulging, stretched laminate, radial cracking, or a developing split follows excessive internal pressure.	
☐	I45 Vacuum collapse	LOCATION / PHOTO / FOLLOW-UP
	The shell or roof pulls inward with compressed liner wrinkles and buckle ridges.	
☐	I46 Catastrophic bottom or shell rupture	LOCATION / PHOTO / FOLLOW-UP
	A large opening with peeled laminate layers, broken glass bundles, and separated corrosion barrier causes a major release.	

AST SUPPLEMENT

Aboveground storage tank

Aboveground tanks expose the exterior laminate, supports, attachments, and connections to weather, process spills, mechanical loads, and foundation movement. Photograph the whole tank from fixed viewpoints before recording close details.

FOCUSED CHECKLIST

- ☐ Foundation settlement, cracking, drainage, and support continuity
- ☐ Bottom-edge and lower-knuckle condition
- ☐ Shell plumbness, roundness, bulging, or buckling
- ☐ Anchor lugs, hold-downs, saddles, skirts, and metallic hardware
- ☐ UV exposure, weathering, exterior resin condition, and fiber blooming
- ☐ Nozzle loading from piping, valves, equipment, and thermal movement
- ☐ Roof, vent, overflow, mixer, ladder, platform, and handrail attachments
- ☐ Secondary containment staining, standing liquid, and drainage
- ☐ Flood, uplift, wind, freeze, fire, heat, or seismic history
- ☐ Prior repairs, overlaminates, and recurring locations

SUPPLEMENT NOTES / RECORD REFERENCES

UST SUPPLEMENT

Underground storage tank

Much of an underground tank may be inaccessible during a routine walkdown. Document accessible components and available records without assuming the condition of buried surfaces. The method, testing scope, access plan, and acceptance basis must fit the tank and service.

FOCUSED CHECKLIST

- ☐ Accessible risers, sumps, vaults, covers, and penetrations
- ☐ Fill, vent, withdrawal, and monitoring connections
- ☐ Settlement, movement, loading, or damage at accessible piping
- ☐ Groundwater, flood, uplift, or flotation history
- ☐ Leak-detection or monitoring records
- ☐ Product inventory or reconciliation concerns
- ☐ Access or excavation history
- ☐ Prior lining, relining, patching, or nozzle work
- ☐ Available installation, backfill, anchorage, and test records
- ☐ Buried or inaccessible surfaces identified as not accessible

SUPPLEMENT NOTES / RECORD REFERENCES

TANKER SUPPLEMENT

FRP tanker trailer

A tanker trailer combines chemical service with cyclic road loading, vibration, impact exposure, repeated filling and emptying, and equipment connections. This supplement supports documentation and does not replace manufacturer, carrier, inspection, testing, or regulatory requirements.

FOCUSED CHECKLIST

- ☐ Overall shell shape and exterior laminate
- ☐ Impact, abrasion, gouging, stress whitening, and exposed fibers
- ☐ Saddles, frame interfaces, supports, and attachment points
- ☐ Manways, hatches, gaskets, covers, and fasteners
- ☐ Inlets, outlets, valves, vents, hoses, and connected piping
- ☐ Baffles and internal attachments, when inspection is authorized
- ☐ Road-debris, tire, jackknife, rollover, and collision damage
- ☐ UV and weather exposure
- ☐ Cargo compatibility, cleaning history, and temperature history
- ☐ Prior repairs and recurring conditions

SUPPLEMENT NOTES / RECORD REFERENCES

PHOTOGRAPH LOG

Build a sequence that explains the tank, location, and detail.

Take an overall view for orientation, a medium view for the component and fixed features, and a close view for the condition. Preserve the original file and record annotations separately.

PHOTO 01	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
	CAPTION / SHORT NOTE	_____	

PHOTO 02	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
	CAPTION / SHORT NOTE	_____	

PHOTO 03	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
	CAPTION / SHORT NOTE	_____	

PHOTO 04	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
	CAPTION / SHORT NOTE	_____	

PHOTOGRAPH LOG

Photograph log / continued

Use the same file naming, location, and view conventions throughout the inspection record.

PHOTO 05	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
	CAPTION / SHORT NOTE		

PHOTO 06	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
	CAPTION / SHORT NOTE		

PHOTO 07	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
	CAPTION / SHORT NOTE		

PHOTO 08	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
	CAPTION / SHORT NOTE		

PHOTOGRAPH LOG

Photograph log / continued

Use the same file naming, location, and view conventions throughout the inspection record.

PHOTO 09	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
CAPTION / SHORT NOTE			

PHOTO 10	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
CAPTION / SHORT NOTE			

PHOTO 11	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
CAPTION / SHORT NOTE			

PHOTO 12	PHOTO ID / FILE NAME	TANK ID	EXTERIOR / INTERIOR
	_____	_____	_____
	COMPONENT AND PRECISE LOCATION	CONDITION ID	VIEW / DIRECTION
	_____	_____	_____
CAPTION / SHORT NOTE			

OBSERVATION REGISTER

Turn each visible condition into a traceable record.

Assign a record number, precise location, condition ID when useful, photograph references, surface state, comparison, and follow-up. This register organizes communication; it does not assign a structural rating or fitness-for-service decision.

OBS 01	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 02	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 03	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 04	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 05	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 06	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 07	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		

OBSERVATION REGISTER

Observation register / continued

Continue the same neutral language and traceable references.

OBS 08	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 09	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 10	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 11	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 12	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 13	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 14	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		

OBSERVATION REGISTER

Observation register / continued

Continue the same neutral language and traceable references.

OBS 15	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 16	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 17	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 18	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 19	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 20	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		
OBS 21	CONDITION / LOCATION	PHOTO IDS	STATUS / FOLLOW-UP
	WHAT IS VISIBLE / EXTENT / COMPARISON / ACTION		

REPAIR READINESS

Prepare a complete record before scope development.

A complete condition record helps the owner, inspector, engineer, manufacturer, and repair contractor understand the asset. Repair planning should address the mechanism, affected area, compatibility, laminate requirements, connected loads, access, cure, inspection, documentation, and return-to-service requirements.

- ☐ Tank identification and drawings
- ☐ Manufacturer and laminate information
- ☐ Current and historical product
- ☐ Chemical concentration and contaminants
- ☐ Operating and design temperatures
- ☐ Operating and design pressure or vacuum
- ☐ Specific gravity and liquid level
- ☐ Agitation, flow, solids, abrasion, and impingement
- ☐ Venting and overflow configuration
- ☐ Condition map and observation records
- ☐ Original, unedited photographs

PAGE NOTES / PHOTO IDS / FOLLOW-UP

REPAIR READINESS

Prepare a complete record before scope development. / continued

Continue the same route and documentation method. Record location, photographs, extent, comparison, and follow-up for every observed condition.

- ☐ Measurements and test records from qualified personnel
- ☐ Prior inspection, repair, and reline records
- ☐ Connected piping, valve, equipment, and thermal-movement information
- ☐ Foundation, anchorage, support, and settlement information
- ☐ Facility-controlled access and site-work requirements
- ☐ Required quality records and acceptance basis
- ☐ Required project schedule and outage window

PAGE NOTES / PHOTO IDS / FOLLOW-UP

NEXT-STEP DIRECTORY

Match the observation to the right Plastech service.

Share drawings, service conditions, operating history, photographs, and inspection records. Plastech can help facilities plan the next step for inspection, localized repair, broader relining, nozzle or flange work, onsite FRP service, underground tanks, connected piping, or urgent response after site controls are active.

Inspection and reports

Plan project-specific condition assessment, documentation, and repair planning.

[Fiberglass tank inspection](#)

Tank repair

Discuss localized shell, bottom, roof, support, connection, or laminate damage.

[Fiberglass tank repair](#)

Tank relining

Evaluate broader corrosion-barrier deterioration and internal relining needs.

[Fiberglass tank relining](#)

Nozzle and flange repair

Address reinforced openings, flange faces, nozzle necks, manways, vents, and fittings.

[FRP tank nozzle and flange repair](#)

Onsite FRP services

Coordinate field evaluation, repair, modification, reinforcement, or installation.

[Onsite FRP services](#)

Underground tanks

Explore UST repair, relining, modification, and accessible-component support.

[Underground tank repair and relining](#)

Fiberglass piping

Review connected FRP pipe repair, modification, and installation needs.

[Fiberglass pipe repair](#)

Emergency response

Contact Plastech after facility emergency and site-control procedures are active.

[Emergency response services](#)

TALK WITH PLASTECH

Industrial FRP inspection, repair planning, repair, relining, and field service support.

[\(410\) 737-4700](tel:(410)737-4700)

www.plastechservices.com

[Request a project review](#)

FURTHER READING

Published references for project-specific review.

Standards and regulations apply only within their stated scope, and editions can change. Confirm the requirements that govern the actual tank, stored product, location, and project.

- 01 [ASTM D3299 - FRP corrosion-resistant tanks](#)
- 02 [ASME RTP-1 - Reinforced thermoset plastic equipment](#)
- 03 [ASTM C582 - Contact-molded corrosion-resistant laminates](#)
- 04 [ASTM C581 - Chemical resistance of thermosetting resins](#)
- 05 [ASTM E1067/E1067M - Acoustic emission examination of FRP tanks](#)
- 06 [FRPI standards and AST inspector resources](#)
- 07 [OSHA 29 CFR 1910.146 - Permit-required confined spaces](#)
- 08 [U.S. EPA underground storage tank requirements](#)
- 09 [U.S. Bureau of Reclamation - Condition Assessment of FRP Composite Pipe and Tanks](#)
- 10 [U.S. DOT cargo tank specifications](#)
- 11 [Transport Canada - CSA B620 highway tanks and portable tanks](#)

Use with qualified judgment

This workbook supports inspection planning, consistent documentation, and clearer communication. It does not replace the tank manufacturer's instructions, facility procedures, applicable standards, regulatory requirements, or asset-specific engineering and inspection decisions.