

TPU 柔性护油池现场铺装与使用技术说明

TPU Flexible Oil Containment Pool – Site Installation and Operation Manual

产品型号 / Model: TPU-1550-500-30

产品尺寸 / Dimensions: 15.5m (L) × 5m (W) × 0.3m (H)

适用工况 / Application Lifting operations, vehicle access onto the pool, temporary or semi-permanent oil collection

一、产品结构与特点

I. Product Structure and Features

主体材料 / Main Material: High-strength polycarbonate-based TPU composite fabric with reinforced mesh, thickness 1.2~1.5mm, oil-resistant, abrasion-resistant, tear-resistant.

设计用途 / Designed Use: Serves as an oil containment pool for lifting operations, capable of withstanding short-term vehicle access (e.g., crane, truck) and operation on the pool surface.

- 配套组件 / Included Accessories**:

- GEO geotextile fabric (bottom protection layer)
- Rubber mats (load distribution, pool bottom protection)
- Inlet/outlet ports with sealing caps
- Anti-static grounding device

二、铺装前准备

II. Pre-Installation Preparation

1. 场地要求 / Site Requirements

- 地面应平整、压实、无尖锐物（石块、钢筋、焊渣、树根等）。建议提前用压路机碾压平整。

The ground must be **level, compacted, and free of sharp objects** (stones, rebar, welding slag, tree roots, etc.). Rolling with a vibratory roller in advance is recommended.

- 场地坡度应 $\leq 3^\circ$ ，避免护油池倾斜导致油液偏向一侧。

Site slope $\leq 3^\circ$ to prevent oil from accumulating on one side due to tilting.

- 确认作业车辆（吊车、卡车）的最大轮压，确保设计承重能力满足要求（一般按轮压 $\leq 2.5\text{MPa}$ 设计，具体以厂家核算为准）。

Confirm the maximum wheel load of the operating vehicles (crane, truck) to ensure the design load capacity is met (typically designed for wheel load $\leq 2.5\text{MPa}$; final value subject to manufacturer verification).

2. 工具与辅料 / Tools and Auxiliary Materials

- 人工或小型叉车（用于展开池体） / Manual labor or small forklift (for unfolding the pool)

- 橡胶锤、地锚钉或沙袋（用于固定池边） / Rubber mallet, ground anchors, or sandbags



(for edge fixing)

- 防静电接地线、接地极 / Anti-static grounding wire, grounding rod
- 备用橡胶垫片、修补包 / Spare rubber gaskets, repair kit

三、铺装步骤（详细）

III. Installation Procedure (Detailed)

第 1 步：铺设 GEO 土工布（底层保护）

Step 1: Lay GEO Geotextile Fabric (Bottom Protection)

1. 将 GEO 土工布展开，铺设在已平整的场地上。

Unfold the GEO geotextile fabric and lay it on the prepared leveled ground.

2. 土工布尺寸应大于护油池外缘，建议每边宽出 0.5~1.0 米，以保护池体边缘不受地面磨损。

The geotextile dimensions should be larger than the outer perimeter of the pool; it is recommended to extend 0.5~1.0 m beyond each edge to protect the pool edges from ground abrasion.

3. 土工布搭接处应重叠 $\geq 30\text{cm}$ ，并用 U 形钉或沙袋固定，防止移位。

Overlaps of the geotextile should be $\geq 30\text{ cm}$ and secured with U-shaped pins or sandbags to prevent shifting.

4. 检查：确保土工布表面无褶皱、无破损，完全覆盖作业区域。

Inspection: Ensure the geotextile surface is wrinkle-free, undamaged, and fully covers the working area.

第 2 步：展开 TPU 护油池

Step 2: Unfold the TPU Oil Containment Pool

1. 将折叠的 TPU 护油池运至土工布中央，多人配合小心展开，严禁在地面拖拉。

Transport the folded TPU pool to the center of the geotextile. With multiple personnel, carefully unfold the pool. Dragging on the ground is strictly prohibited.

2. 调整池体位置，使池体四周均匀分布在土工布上，进出油口朝向便于接管的方向。

Adjust the pool position so that the entire pool is evenly placed on the geotextile, with the inlet/outlet ports facing a direction convenient for hose connection.

3. 将池体四角及边沿展平，避免出现折叠或扭曲。

Flatten the four corners and edges of the pool to avoid folds or twists.

第 3 步：铺设橡胶垫（轮压保护层）

Step 3: Lay Rubber Mats (Wheel Load Protection Layer)

1. 根据作业车辆计划行驶的路线，在池体内部铺设橡胶垫。

Lay rubber mats inside the pool according to the planned driving path of the operating vehicles.

2. 铺设要求 / Installation Requirements**:

- 橡胶垫厚度建议 $\geq 12\text{mm}$ ，硬度（邵氏 A）70~80，耐油耐磨。

Recommended rubber mat thickness $\geq 12\text{mm}$, hardness (Shore A) 70~80, oil-resistant

and abrasion-resistant.

- 行驶路线应覆盖车辆所有轮迹范围，包括进出通道和吊装作业停留区域。

The driving path shall cover all tire contact areas, including access routes and crane positioning zones.

- 橡胶垫之间搭接 $\geq 10\text{cm}$ ，搭接处用胶带或重物压牢，防止车辆起步时掀起。

Rubber mats shall overlap by $\geq 10\text{ cm}$; overlapping areas shall be secured with tape or heavy objects to prevent lifting when vehicles start moving.

- 若车辆需在池内转向或大范围移动，建议满铺橡胶垫。

If vehicles need to turn or move extensively inside the pool, full coverage of rubber mats is recommended.

3. 非行驶区域：可不铺橡胶垫，但需保持清洁，防止工具掉落损坏池底。

Non-driving areas: Rubber mats may be omitted, but they must remain clean to prevent tools from falling and damaging the pool bottom.

第 4 步：固定池体

Step 4: Secure the Pool

- 沿池体四周边缘，每隔 1.5~2.0 米用**地锚钉（硬质地面）或沙袋（软质地面）固定，防止车辆上下池时池边滑移或卷起。

Along the pool perimeter, secure with ground anchors (on hard surfaces) or sandbags (on soft surfaces) every 1.5~2.0 m to prevent the pool edge from sliding or curling up when vehicles enter or exit.

- 若使用地锚，锚钉应打入地面深度 $\geq 30\text{cm}$ ，并通过绳索与池体边缘拉环连接，保持适度张紧。

If using ground anchors, they shall be driven into the ground to a depth of $\geq 30\text{ cm}$ and connected to the pool edge loops with ropes, maintaining moderate tension.

第 5 步：连接管路与接地

Step 5: Connect Piping and Grounding

1. 安装进出油口快速接头或法兰，确保密封圈完好、连接紧固。

Install the quick couplings or flanges at the inlet/outlet ports, ensuring the seals are intact and connections are tight.

2. 防静电接地 / Anti-static Grounding: 将防静电接地线一端连接池体金属接地端子，另一端连接打入地下的接地极（深度 $\geq 1\text{m}$ ），接地电阻应 $\leq 10\Omega$ 。

Connect one end of the anti-static grounding wire to the metal grounding terminal on the pool, and the other end to a grounding rod driven into the ground (depth $\geq 1\text{ m}$); the grounding resistance shall be $\leq 10\ \Omega$.

3. 连接排油管路至集油罐或油桶，排油口应处于低点位置，便于排空。

Connect the oil discharge hose to an oil collection tank or drum. The discharge port shall be positioned at a low point to facilitate complete drainage.

第 6 步：铺装后检查

Step 6: Post-Installation Inspection



- 池体内部无杂物、无尖锐颗粒。
The pool interior is free of debris and sharp particles.
- 橡胶垫铺设平整，无翘边。
Rubber mats are laid flat with no curling edges.
- 所有固定点牢固，接地可靠。
All fixing points are secure, and grounding is reliable.
- 可进行试水：注入约 10cm 深度清水，静置 30 分钟，检查有无渗漏及池体变形。
A water test may be conducted: fill with clean water to a depth of approximately 10 cm, let it stand for 30 minutes, and check for leaks or deformation.

四、使用方法（含车辆上池作业）

IV. Operation Method (Including Vehicle Access onto the Pool)

1. 车辆上池前检查 / Pre-Access Inspection

- 确认池内橡胶垫已按行驶路线铺设到位。
Confirm that the rubber mats have been laid along the driving path.
- 检查作业车辆轮胎表面无石子、无铁屑、无焊渣，必要时用钢板或木方垫在轮胎下方过渡。
Inspect the vehicle tires to ensure they are **free of stones, metal chips, and welding slag**. If necessary, use steel plates or timber as transition ramps under the tires.
- 严禁履带式车辆直接上池（需额外铺设钢板分散压力）。
Crawler vehicles are strictly prohibited** from directly accessing the pool (additional steel plates must be laid to distribute the load).

2. 车辆上池操作规范 Vehicle Access Operation Specifications

步骤 Step | 操作要求 Operation Requirements

上池 Access | 车辆以 $\leq 5\text{km/h}$ 的速度缓慢上池，不得急冲、急刹。上池点应选择池边有加固的位置，避免池边受力过大 Vehicle shall access the pool slowly at $\leq 5\text{ km/h}$, with no sudden acceleration or braking. The entry point shall be at a reinforced edge to avoid excessive stress on the pool edge.

行驶 / Driving | 严格沿铺设橡胶垫的路线行驶，不得随意碾压无保护区域。 Strictly drive along the rubber-mat-covered path; do not run over unprotected areas. |

吊装作业 Lifting Operations 吊车支腿应垫在专用支腿垫板上，且支腿垫板下方必须加铺橡胶垫+钢板，分散压力，严禁支腿直接压在池体上。 Crane outriggers shall be placed on dedicated outrigger pads, with rubber mats + steel plates laid underneath to distribute pressure. Outriggers are strictly prohibited from bearing directly on the pool fabric.

停留 Parking 车辆停留期间，发动机熄火，防止高温排气管烫伤池体。 While the vehicle is parked, the engine shall be turned off to prevent the hot exhaust pipe from burning the pool fabric.

下池 Exit 同样缓慢驶出，避免轮胎打滑。 Exit slowly as well to avoid tire slippage.



3. 油液注入与收集 Oil Filling and Collection

- 吊装作业前，池内可预先注入少量清水（约 5cm 深）形成液封，便于后续清理。

Before lifting operations, a small amount of clean water (approximately 5 cm depth) may be added to form a liquid seal, facilitating subsequent cleaning.

- 作业过程中，油液自然流入池内，液面高度不得超过设计安全线（0.3m 池高，建议液位 $\leq 0.25\text{m}$ ）。

During operations, oil flows naturally into the pool. The liquid level shall not exceed the design safe limit (pool height 0.3 m, recommended level $\leq 0.25\text{ m}$).

- 定期（每 2 小时）检查液位，接近上限时及时通过排油口转移至储油罐。

Inspect the liquid level regularly (every 2 hours); when approaching the upper limit, promptly transfer oil to a storage tank via the discharge port.

4. 排空与清理 / Draining and Cleaning

- 作业结束后，用排油泵将油液全部抽出。

After operations, use an oil transfer pump to completely drain the oil.

- 残留油污用吸油棉或干布擦拭干净，不得使用强溶剂清洗。

Remove residual oil with oil-absorbing pads or dry cloths. Do not use strong solvents for cleaning.

- 检查池底有无被尖锐物刺穿，如有破损及时修补。

Inspect the pool bottom for punctures from sharp objects; repair any damage promptly.

五、使用年限与维护

V. Service Life and Maintenance

1. 设计使用寿命 / Design Service Life

- 正常使用条件下（无尖锐物损伤、无超负荷碾压、无长期日晒）：3~5 年。

Under normal operating conditions (no damage from sharp objects, no overloading, no prolonged UV exposure): 3 to 5 years.

- 若仅用于临时作业且妥善保管，寿命可达 5~8 年。

If used only for temporary operations and properly stored, the service life can reach 5 to 8 years.

- 影响因素 / Influencing Factors: 紫外线照射、油温、化学腐蚀、机械损伤。

UV exposure, oil temperature, chemical corrosion, mechanical damage.

2. 日常检查（每次使用前） / Daily Inspection (Before and After Each Use)

| 检查项 | Item | 内容 | Inspection Content |
|-----|-------------|-------------------|---|
| 池体 | Pool | 有无划伤、刺孔、接缝剥离、老化裂纹 | Scratches, punctures, seam separation, aging cracks |
| 橡胶垫 | Rubber Mats | 有无破损、移位 | Damage, shifting |

GEO 土工布 / GEO Geotextile | 有无破损、移位, 如有破损需更换 Damage, shifting; replace if damaged |

固定装置 / Fixing Devices | 地锚、沙袋是否松动 Loose ground anchors or sandbags |

接地线 / Grounding Wire | 是否连接可靠, 接地电阻测试
 Secure connection, ground resistance test |

3. 定期维护 (每 3 个月或使用 10 次后) / Periodic Maintenance (Every 3 Months or After 10 Uses)

- 彻底清洁池体内外, 检查热合缝强度。
Thoroughly clean the pool inside and out; inspect the strength of heat-sealed seams.
- 检查进出油口密封圈, 老化则更换。
Inspect inlet/outlet port seals; replace if aged.
- 检查橡胶垫磨损情况, 磨损严重则更换。
Inspect rubber mats for wear; replace if severely worn.
- 补充或更换地锚、拉绳等易损件。
Replenish or replace consumable parts such as ground anchors and pull ropes.

4. 存储要求 / Storage Requirements

- 使用后彻底清洁并晾干, 折叠存放于阴凉、干燥、避光处。
After use, thoroughly clean and air-dry, then fold and store in a cool, dry, dark place.
- 不得与化学品、尖锐物混放。
Do not store together with chemicals or sharp objects.
- 堆放高度不超过 1.5m。
Stacking height shall not exceed 1.5 m.

六、特别注意问题 (关键安全事项)

VI. Critical Safety Considerations

△□ 1. 车辆碾压风险 / Vehicle Load Risk

- 绝对禁止车辆轮胎直接碾压无橡胶垫保护的池体区域, 否则瞬间高压会刺穿或撕裂 TPU 材料。

Strictly prohibited: vehicle tires directly contacting the pool fabric without rubber mat protection. The instantaneous high pressure will puncture or tear the TPU material.

- 车辆上池前, 必须由专人检查轮胎及橡胶垫表面清洁度。

Before vehicle access, a designated person must inspect the cleanliness of tires and the surface of the rubber mats.

- 车辆上池时, 池边应有专人指挥, 严禁超速、急转。

During vehicle access, a spotter shall guide the vehicle at the pool edge; speeding and sharp turns are strictly prohibited.

△□ 2. 高温与火源 / High Temperature and Ignition Sources

- 车辆排气管、吊车发动机高温部位不得接触池体，建议安装防火罩或保持 $\geq 50\text{cm}$ 距离。
Hot components such as vehicle exhaust pipes and crane engines shall not contact the pool fabric. It is recommended to install a spark arrestor or maintain a distance of $\geq 50\text{ cm}$.
- 池体周围 5m 内严禁明火、电焊、切割等热作业。
No open flames, welding, cutting, or other hot work within 5 m of the pool.
- 现场应配备灭火器（干粉或泡沫型）。
Fire extinguishers (dry powder or foam type) shall be available on site.

△□ 3. 防静电与防爆 / Anti-Static and Explosion Prevention

- 在油气环境下，必须连接防静电接地线，作业前测试接地电阻 $\leq 10\Omega$ 。
In an oil and gas environment, the **anti-static grounding wire must be connected**, and the ground resistance shall be tested before operations, with a value $\leq 10\ \Omega$.
- 所有电气设备（泵、照明）必须使用防爆型。
All electrical equipment (pumps, lighting) shall be explosion-proof.

△□ 4. 尖锐物防范 / Sharp Object Prevention

- 铺设 GEO 土工布前，必须彻底清理地面尖锐物。
Before laying the GEO geotextile, thoroughly remove all sharp objects from the ground.
- 作业人员进入池内必须穿软底鞋，严禁携带尖锐工具。
Personnel entering the pool must wear soft-soled shoes; carrying sharp tools is strictly prohibited.
- 吊装过程中，防止吊钩、钢丝绳、构件掉落砸伤池体。
During lifting operations, prevent hooks, wire ropes, or components from falling and striking the pool.

△□ 5. 泄漏应急处理 / Leak Emergency Response

- 若发现池体破损泄漏，立即停止作业，转移油液。
If damage or leakage is detected, **stop operations immediately** and transfer the oil.
- 用厂家提供的专用修补包进行冷补或热补，修补后需进行压力测试方可继续使用。
Use the manufacturer's special repair kit for cold or hot patching. The repaired area must undergo a pressure test before the pool can be returned to service.
- 泄漏油液应立即围堵回收，防止环境污染。
Any spilled oil shall be immediately contained and recovered to prevent environmental pollution.

△□ 6. 环境限制 / Environmental Limitations

- 遇大风 (≥ 6 级) 时，空池状态应加固或排空折叠，防止被风吹翻。
In strong winds (\geq Beaufort Force 6), the empty pool shall be reinforced or drained, folded,

and secured to prevent being lifted by wind.

- 遇大雨时，应加盖防雨布或及时排空，防止池内积水溢流造成油水混合。

In heavy rain, a rain cover shall be installed, or the pool shall be drained promptly to prevent overflow and oil-water mixing.

七、技术参数简表

VII. Technical Data Summary

项目 / Parameter | 参数 / Value |

|-----|-----|

有效容积 / Effective Volume | 约 23 m³ (设计容积，实际使用建议 ≤20 m³)
 Approximately 23 m³ (design volume; recommended working volume ≤20 m³)

池体自重 / Pool Self-Weight | 约 120~150 kg / Approximately 120~150 kg |

适用油温 / Applicable Oil Temperature | -20°C ~ +80°C |

最大轮压 (静态) / Maximum Wheel Load (Static) | ≤2.5 MPa (需配合橡胶垫)
 ≤2.5 MPa (with rubber mat protection) |

接地电阻要求 / Grounding Resistance Requirement | ≤10 Ω |

抗拉强度 / Tensile Strength | ≥3000 N/5cm (经向/纬向)
 ≥3000 N/5cm (warp/weft)

耐油性 / Oil Resistance | 120#溶剂油、柴油、原油浸泡无溶胀
 No swelling after immersion in No. 120 solvent oil, diesel, or crude oil |

八、联系方式

VIII. Contact Information

Bill 13625863196

如在使用过程中遇到任何技术问题，请联系制造商获取支持。

If you encounter any technical issues during operation, please contact the manufacturer for support.

本文件随产品交付，请妥善保管。

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