**IX500:256.256.16**
**IX500:256.256.22**

# User Guide

## XSENSOR Pressure Imaging System

XSENSOR® Technology Corporation

# 1. Introduction

Thank you for purchasing the XSENSOR pressure imaging system. XSENSOR's goal is to provide you with the highest quality, most technically advanced, and most versatile dynamic pressure imaging system available today while maintaining ease of use. We hope you enjoy using your new XSENSOR pressure imaging system, and we welcome your comments or suggestions for future enhancements.

# 2. Overview

This guide is designed to make recommendations on the proper usage of your sensor pad.
**Testing outside these recommendations may result in damage of the sensor pad.**

# 3. Sensor Pad Usage

The sensor pad can be used to measure pressures up to, but not exceeding the maximum operating pressure of 250 PSI (12,927 mmHg).

1. **Warning:** A slip layer stack up must always be used for all loads applied to the sensor pad (see 4. Slip Layer Usage)
2. **Warning:** The sensor pad must be used on a flat and even surface that will not deform under the applied load.
3. **Warning:** The sensor pad must remain fixed to the test surface during usage.
4. **Warning**: All loads applied must be perpendicular to the surface of the sensor (see Figure 1).

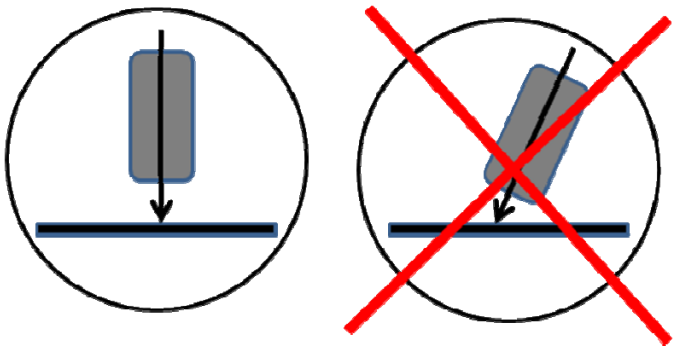

**Figure 1:** Apply load perpendicularly.

5. **Warning:** Do not apply shear loads the sensor pad (see Figure 2).

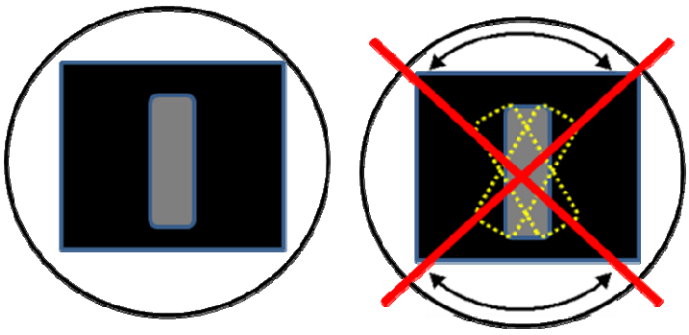

**Figure 2:** Turning a tire in contact with the sensor will apply shear loads to the sensor pad.

6. **Warning:** Do not apply load to the sensor for more than 3-5 minutes. It is best to try to minimize the amount of time that the sensor is under load.
7. **Warning:** The sensor should be allowed to relax for a minimum of 5 minutes between tests.

## 4. Slip Layer Usage

Slip layers reduce/minimize shear on the surface of the sensor pad. Using slip layers will help extend the life of your sensor pad, as wear and tear will be applied to the slip layers and not the sensor pad itself.

Figure 4, below, shows the result of loading the sensor with a mining tire on a vertical press **without** the use of a slip layer stack up. Lug movement (due to compression of the tire) across the sensor causes pinching and pulling of the sensor which will result in damage to the sensor cover and internal components.

Figure 4: Lug movement across sensor without slip layers will damage the sensor.

As can be seen below (Figure 5) correct use of a slip layer stack will cause the lugs to slide across the surface of the sensor.

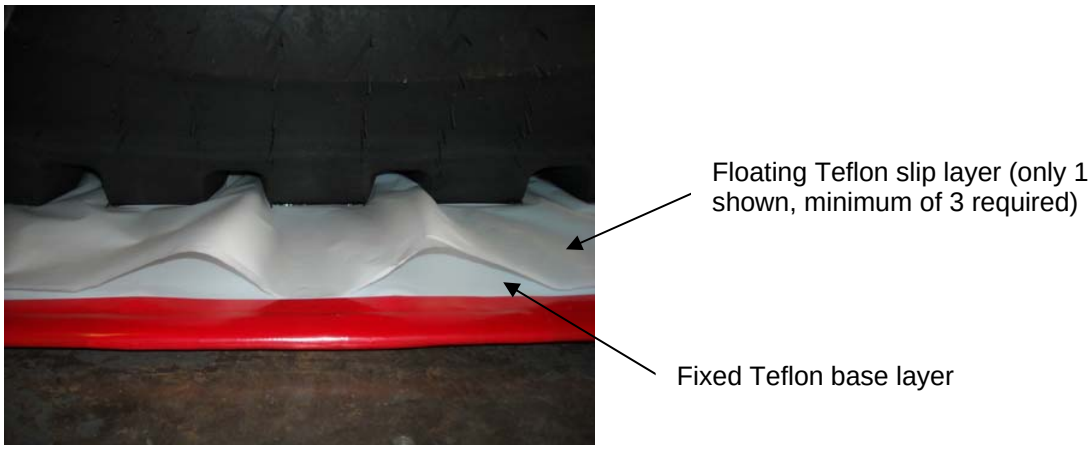


Figure 5: Using slip layers prevent damage to the sensor.

A slip layer stack up consists of a 0.010” THK. Teflon base layer and a minimum of three floating 0.005” THK. Teflon slip layers. The base layer is fixed to the sensor by taping it around the perimeter of the sheet. It is important that the base layer remains fixed otherwise the slip layers will not slip across the sensor surface (Teflon base layer). It is also important to use more than one slip layer, sometimes two layers will bind together due to a large crease in the layer or small object between the layers. If the layers bind they will not slip. The slip is not always removed completely by one layer so multiple layers are required and multiple layers also provide slip redundancy if two layers bind. The floating layers are laid on top of the base layer in a stack.

## Slip Layer Usage Instructions

**1.** Center base layer (0.01” THK. Teflon sheet) on sensor and tape layer completely around perimeter. Ensure that the base layer is securely attached and will not move.

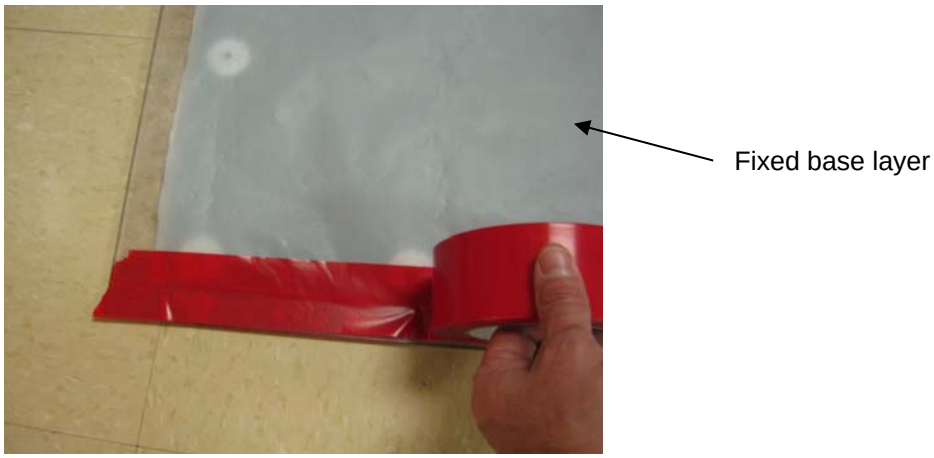


**Figure 5:** Attach fixed Teflon base layer to sensor using tape.

**2.** Apply a minimum of three floating layers on top of the fixed base layer. Ensure that each layer slides in dependently (no binding) and that there is no foreign material between the layers.

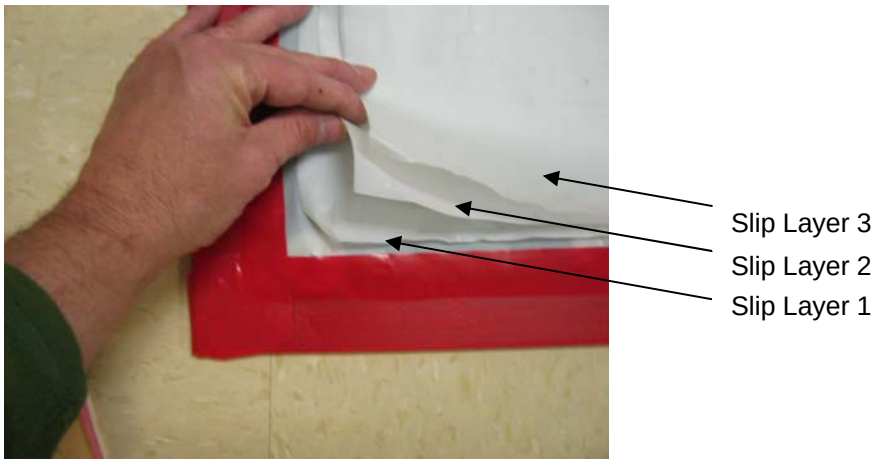


**Figure 6:** Proper placement of slip layers.

**3.** Apply loading to sensor.

4. After each loading and before the next loading the floating slip layers should be removed and individually wiped down to ensure that any layers that are stuck together are unstuck. Also any small objects or dirt between the layers needs to be removed as this will cause the layers to bind.

   **Warning:** No other material (fluid or solid) must lie between any of the slip layers or between the base layer and the sensor pad's surface.
   **Warning:** Floating slip layers should be individually wiped down and un-stuck after each loading.
   **Warning:** Slip layers will become creased over time and will lose their effectiveness and therefore need to be replaced regularly.

## Slip Layer Replacement

As can be seen in the image below the slip layers will become creased over time. As the layers become more and more creased they lose their effectiveness and need to be replaced.

**Figure 6:** Slip layers become creased over time and need to be replaced.

The effective lifetime of the slip layers is dependent on the type and magnitude of the loads applied to the sensor. The following testing was performed successfully on one set of slip layers with a IX500.192.192.016 mining tire sensor. After the completion of this testing the slip layers required replacement.

- Testing was performed on a vertical press.
- Test tire size was approx. 13’ tall by 2.5’ wide
- Each test was approximately 3-5 minutes long.
- Sensor was allowed to relax for 10 minutes between tests.

**Test #1:** 69 PSI inflation and loading too 44,000lbs and 88,000lbs
**Test #2:** 69 PSI inflation and loading too 44,000lbs and 88,000lbs (sensor flipped)
**Test #3:** 83 PSI inflation and loading too 55,000lbs and 100,000lbs
**Test #4:** 83 PSI inflation and loading too 55,000lbs and 100,000lbs (sensor flipped)
**Test #5:** 100 PSI inflation and loading too 74,000lbs and 150,000lbs
**Test #6:** 100 PSI inflation and loading too 74,000lbs and 150,000lbs (sensor flipped)
**Test #7:** 102 PSI inflation and loading too 60,000lbs, 150,000lbs and 120,000lbs
**Test #8:** 102 PSI inflation and loading too 60,000lbs, 150,000lbs and 120,000lbs (sensor flipped)
**Test #9:** 120 PSI inflation and loading too 99,000lbs and 160,000lbs
**Test #10:** 120 PSI inflation and loading too 99,000lbs and 160,000lbs (sensor flipped)
**Test #11:** 145 PSI inflation and loading too 134,000lbs and 160,000lbs
**Test #12:** 145 PSI inflation and loading too 143,000lbs and 160,000lbs (sensor flipped)

## 5. Slip layer stack up material specifications:

### Teflon Spec:

| Slip Layer Specifications | |
|---|---|
| Material | Fluoropolymers |
| Fluoropolymer Material | Virgin Electrical Grade Teflon® PTFE |
| Backing | Plain Back |
| Finish | Smooth |
| Shape | Film |
| Film Style | Standard |
| Thickness | Floating Layer = 0.005" (0.013 cm) , Base Layer = 0.010” (0.026 cm) |
| Thickness Tolerance | ±.0005" (±0.001 cm) |
| Length | Cut-to-Length |
| Available Lengths | 1, 2, 3, 6, 10, and 20 feet (30, 61, 91, 183, 305, and 610 cm) |
| Maximum Continuous Length | 20' (610 cm) |
| Width | 48" (121.90 cm) |
| Width Tolerance | ±1/16" (±0.16 cm) |
| Opaque | White |
| Operating Temperature Range | -350° to +500° F (-212° C to 260° C) |
| Softening Point | Not Rated |

| | |
|---|---|
| Performance Characteristic | Electrical Insulator, Weather Resistant, Very Low Friction,Wash-Down Applications |
| Tensile Strength | Poor |
| Impact Strength | Good |
| Tolerance | Standard |
| Hardness | Rockwell R58 |
| Specifications Met | 3A Sanitary Standards (3A) Compliant, Aerospace Material Specifications (AMS), American Society for Testing and Materials (ASTM), Food and Drug Administration (FDA) Compliant, Underwriters Laboratories (UL) |
| AMS Specification | AMS 3651 |
| ASTM Specification | ASTM D3308 |
| UL Rating | UL 94V0 |
| Note | Also known as skived sheet. Colour varies from translucent white to opaque white. |

**Tape Spec:**

Manufacturer: AWT World Trade Inc.

Description: 2” wide, pressure sensitive, red polyethylene, solvent and water resistant screen tape.

P/N: RT-210

## Contact Information

Information will be made available for the repair or maintenance of the equipment to authorized repair facilities.

For additional information regarding this product, please contact XSENSOR at:

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**IX500:256.256.16, IX500.256.256.22 User Guide Revision 1**

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