

Indigo XS™ Installation Guide

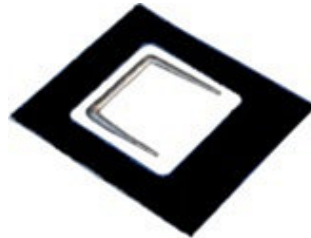
This product is intended for installation only by expert users. Please consult with a qualified technician for installation. Improper installation may result in damage to your equipment. Enerdyne Solutions assumes no liability whatsoever, expressed or implied, for the use of these products, nor their installation. The following instructions are subject to change without notice. Please visit our web site at www.indigo-xtreme.com for updates.

STEP 1: QUICK OVERVIEW

STEP 1.1: Indigo XS:

Engineered Thermal Interface for Socket 1150/1151/1155/1156 (Core™ i5 and Core™ i7 processors)

Indigo XS™ is an Engineered Thermal Interface (ETI) that fits neatly between a CPU lid and water block or heat sink to keep CPUs cooler. Unlike greases, metallic thermal interface pads or liquid metal alloys, Indigo XS is a self-contained and sealed structure, deploying a Phase Change Metallic Alloy (PCMA) which reflows and fills surface defects on the CPU lid and water block/cooler. The resultant interfacial layer is void-free and robust, with low thermal contact and low bulk resistance.



Important: Unlike most thermal interface products, the Indigo XS form-factor is optimized for each application.



Attempting to use Indigo XS with CPUs or heat sinks other than those specified will result in degraded performance or interfacial failure (See: Supported Hardware).

STEP 1.2: Compatibility List:

Supported Hardware:

Supported CPUs: Socket 1150/1155/1156

- Core™ i5
- Core™ i7



Supported Water block/Heat Sink Types:

In general, water blocks and coolers that contact entire surface of CPU lid are compatible with Indigo XS.

Unsupported Heat Sink Types:

Heat sinks that do not contact entire surface of CPU lid, or surfaces with channels between mounting base and heat pipes are incompatible with Indigo XS.



Prior to the installation and reflow of Indigo XS **do not disable** the Thermal Control feature that protects your CPU from overheating.

STEP 1.3: ETI Kit Contents:

The Indigo XS ETI is offered as part of an Engineered Thermal Interface Kit. This kit includes several cleanroom-grade surface cleaning products for (2) complete installations.

The ETI kit includes:

- Indigo XS ETIs (2 installations)
- Cleanroom-grade dry wiper cloths
- Indigo Xtreme Clean™ (sample size)
- Pair of powder-free nitrile gloves
- Detailed Installation Guide



Check the condition of the ETI kit before installation; if any problem is found, contact Enerdyne Solutions for a replacement.

STEP 2: INSTALLATION PROCEDURE

STEP 2.1: Pre-Installation Notes:



The Indigo XS installation steps differ from those found in the Indigo Xtreme guide. Therefore, read entire instructions before beginning installation. Computer operating system and temperature monitoring utilities (such as SpeedFan™ and Prime95™) must be installed prior to use; clock frequency and voltage must be set back to default.



See the applicable Application Note (on the Indigo Xtreme website) with installation tips and recommendations for your specific water block, cooler, or heat sink. Contact Enerdyne Support if you have any questions.

STEP 2.2: Thermal Interface Compound (grease/paste) Removal:

Using a supplied dry wiper cloth, apply pressure to thoroughly remove any existing interface grease from the CPU lid and water block/cooler. Clean with fresh areas of the wiper cloth until no visible grease residue is detected on the wiper.



If removing metal pad or liquid metal TIM residue, refer to manufacturer's specific cleaning methods.

STEP 2.3: Put on Gloves:

Prior to the final degreasing step, the supplied powder-free nitrile gloves should be worn to prevent any finger oils or contaminants from contacting the CPU lid, water block/cooler, and ETI surfaces and to prevent skin contact with Indigo Xtreme Clean™.



Stray grease compound can be mitigated as gloves are applied immediately following the Thermal Interface Compound Removal step.

STEP 2.4: Degrease CPU lid and Water Block/Cooler Surfaces:

Saturate a dry wiper cloth with Indigo Xtreme Clean™; use ~1/2 trial size bottle per ETI installation; thoroughly wipe the CPU lid; repeat with the water block/cooler interfacial surfaces. Continue to wipe each surface with fresh areas of the wiper until no visible residue is detected on the wiper. Wipe all surfaces of any visible lint, fibers, or particulates.



Be prepared to wipe the CPU lid and water block/cooler surfaces immediately upon saturating each dry wiper cloth as the Xtreme Clean™ solvent will quickly evaporate. When finished, seal the used wiper in the ETI kit clear bag. New CPUs or coolers must be degreased as well. Use only the supplied Indigo Xtreme Clean™ for the degreasing step.



Use the Xtreme Clean™ solvent in a well-ventilated area. Avoid contact with plastics (such as keyboards, computer cases, cooling fans, some water block housings, coolant tube fittings, cables, etc.). Also, avoid contact with coolant tubing, gaskets, etc.

STEP 2.7: Alignment and Placement:



Orientation and alignment of the ETI to the CPU lid and socket is critical. Orient the ETI such that the "Bottom" side is facing the CPU lid.



Hold the ETI on the black edges (with both hands). Ensure that the ETI is oriented with CPU lid/socket as shown. Center the narrow, black alignment ring (large red arrows) to the CPU lid top surface before making contact. Carefully lower the ETI onto the CPU lid surface. With moderate, downward finger pressure, completely press down all ETI surfaces onto the CPU lid by following the black alignment ring. Additionally, thoroughly press down the adhesive area to the CPU lid (as indicated by the small red arrows).



It is critical that the narrow black alignment ring is completely on the CPU lid and all black ring surfaces are thoroughly pressed down.

STEP 2.5: Indigo XS Handling:

The Indigo XS ETI may be handled on the black surfaces only within a lint-free environment.



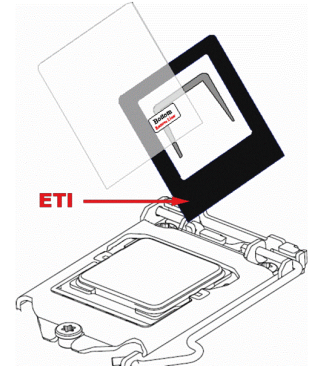
Do not remove the clear Top and Bottom liners prior to the specific installation step. Do not bend, flex or puncture any portion of the ETI. Keep all chemical agents (Indigo Xtreme Clean™, etc.) away from the ETI.

STEP 2.6: Bottom Side Liner Removal:

Remove the "Bottom" side rectangular clear liner by slowly peeling the liner, beginning from the corner with the white BOTTOM" label. Hold the ETI on the black edges (to prevent any wrinkling or warping). **Do not** remove the "Top" liner at this step.



Do not touch the exposed adhesive area after removal of the clear liner. Once the liner has been removed, proceed immediately to Step 2.7: Alignment and Placement.

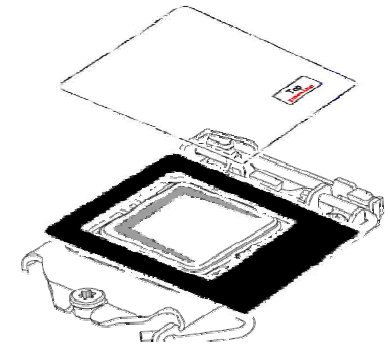


STEP 2.8: Top Side Liner Removal:

Remove the "Top" side rectangular clear liner by slowly peeling the liner, beginning from the corner with the white "TOP" label.



Do not touch any of the clear surfaces after removal of the clear liner. Once the liner has been removed, proceed immediately to Step 2.9: Heat Sink/Block Mounting.



STEP 2.9: Heat Sink/Block Mounting:



It is imperative that the water block/cooler is aligned correctly before it makes contact with the ETI. Avoid any twisting on the ETI as the block is bolted/clamped down. Apply a uniform pressure to the water block/cooler (while clamping) to prevent it from shifting.



For Clip and Bolt mounted sinks/blocks: Initially tighten each bolt to latch onto the clip support threading. Apply uniform torque to all of the bolts (by alternating the tightening of bolts) until tightened to the recommended level. **Application Notes (on the Indigo Xtreme website) provide tightening recommendations for specific water blocks, coolers, and heat sinks.** **For plastic Push-Pin mounted sinks/blocks:** Start with the two push-pins adjacent the socket hinge lever and apply enough force to lock the final two push-pins.

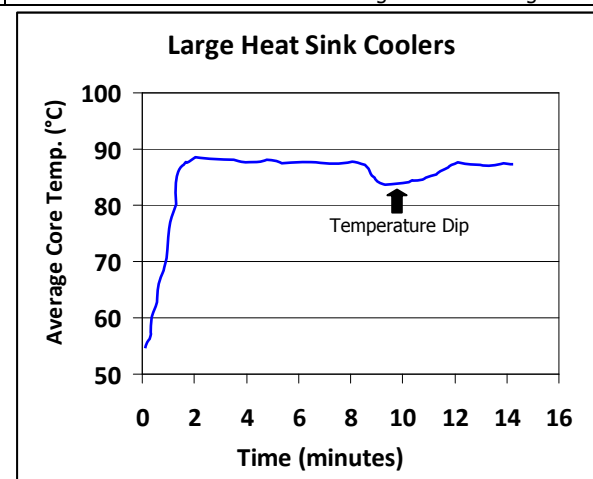
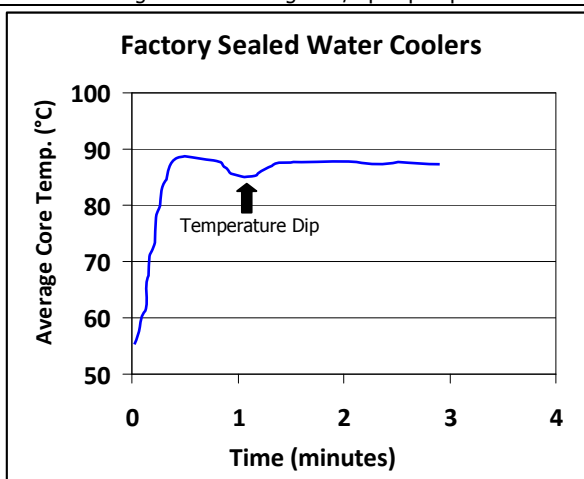
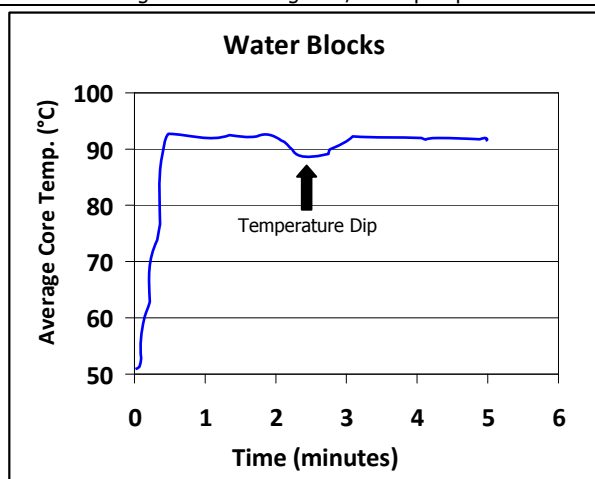
STEP 3: ETI REFLOW PROCEDURE:

Follow the reflow steps below for your cooler type; the motherboard must be in a horizontal position for proper reflow.



As part of installation, the Indigo XS ETI must first be heated with the CPU running under load in order to reflow (melt) the PCMA alloy. Failure to perform the exact reflow procedure may result in unacceptable thermal performance. Video demonstrations of ETI reflow can be found on the Indigo Xtreme website at: <http://www.indigo-xtreme.com>

Step	Water Blocks	Factory Sealed Water Coolers	Large Heat Sink Coolers
3.1	Connect up any water block liquid lines and turn on pump.	Turn on the liquid pump.	See the "Indigo XS/Xtreme Application Note for Noctua NH-D14 CPU Coolers" for large heat sink reflow instructions.
3.2	Boot the computer into Windows (stock freq. and voltage).	Boot the computer into Windows (stock freq. and voltage).	Boot the computer into Windows (stock freq. and voltage).
3.3	Open SpeedFan™, select the "Charts" tab, and check all core boxes to track the core temperatures during reflow.	Open SpeedFan™, select the "Charts" tab, and check all core boxes to track the core temperatures during reflow.	Open SpeedFan™, select the "Charts" tab, and check all core boxes to track the core temperatures during reflow.
3.4	Open Prime 95™ or equivalent burn program and run a "Torture Test" for (8) threads.	Open Prime 95™ or equivalent burn program and run a "Torture Test" for (8) threads.	Open Prime 95™ or equivalent burn program and run a "Torture Test" for (8) threads.
3.5	Immediately following the launch of Prime 95™, disconnect the water pump.	Immediately following the launch of Prime 95™, disconnect the water pump.	Be certain there is no airflow within the PC (case fans, etc); it is recommended to close up the PC case reflow complete.
3.6	Follow the average core temperature profile (with SpeedFan™ in chart mode) illustrated in the chart below.	Follow the average core temperature profile (with SpeedFan™ in chart mode) illustrated in the chart below.	Follow the average core temperature profile (with SpeedFan™ in chart mode) illustrated in the chart below.
3.7	The Temperature Dip will indicate reflow.	The Temperature Dip will indicate reflow.	The Temperature Dip will indicate reflow.
3.8	Following the Temperature Dip and rise back to ~85°C or after 5 minutes of Prime 95™ Torture Testing, shut down PC.	Following the Temperature Dip and rise back to ~85°C or after 3 minutes of Prime 95™ Torture Testing, shut down PC.	Following the Temperature Dip and rise back to ~85°C or after 14-15 min. of Prime 95™ Torture Test, shut down PC.
3.9	Allow PC and water block to cool for at least 45 minutes before booting and connecting fans/water pumps.	Allow PC and water cooler to cool for at least 30 minutes before booting and connecting fans/liquid pump.	Remove cloth shroud and open PC case. Allow PC and sink to cool for at least 30 min. before booting and connecting fans.



Intel multi-core CPUs have built-in protection (Adaptive Thermal Monitor) that prevents the CPU from exceeding maximum core temperatures, thereby preventing damage to the CPU.



Avoid any bumping or excessive pressure on the heat sink/water block and keep the computer in the horizontal position while cooling down. If the average core temperature does not follow a similar temperature profile as seen in the previous graphics, then improper reflow may have occurred. Proceed to "Removal" and re-install a new ETI.

STEP 4: REMOVAL OF INDIGO XS:

To disassemble, release the clamping force from the heat sink/water block. The ETI may then be removed (intact) by first slowly peeling each corner. The ETI is designed to adhesively capture excess alloy (from differences of CPU lid/heat sink interfacial roughness and planarity) on their surfaces. Any residual adhesive on the CPU or heat sink/water block may be removed with Xtreme Clean, acetone, or xylene and a clean wiper or cotton cleaning swab. Residual alloy is best removed by wetting a swab with Xtreme Clean and gentling rotating the swab to loosen and collect the alloy particles.



Indigo XS is a single-use interface product and any removal of the heat sink (pre/post-reflow) will require a new ETI. All interface material and adhesive residue must be removed and the CPU and heat sink re-cleaned (with the surface cleaning supplies included in the ETI kit only) prior to the re-installation of a new ETI.

REFERENCES:

Burn-in/Torture Testing Program: Prime95™: <http://www.mersenne.org/freesoft>

Temperature monitor: Although, numerous temperature monitoring programs exist, SpeedFan™ provides the real-time charting/graphing mode necessary for reflow: <http://www.almico.com/speedfan.php>

The Material Safety Data Sheet (MSDS) for Indigo Xtreme Clean™ can be found at: <http://www.indigo-xtreme/documentation>

Contact us for more information about this or other Indigo XS applications at: info@enerdynesolutions.com

Store Indigo XS at room temperature conditions of 22°C (72°F) and 50% R.H., preferably in the original sealed enclosure and plastic bag.

DISCLAIMER:

Enerdyne Solutions is not responsible for any damages due to external causes, including but not limited to, improper use, accident, neglect, alteration, repair, improper installation, improper testing, or damages caused by overclocking.

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PO Box 2660,
North Bend, WA., 98045 United States of America



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