The Zinsco Electrical Panel, Zinsco Circuit Breakers - Hazard Information Website

Zinsco Electrical Panel Advice for Homeowners and Home Buyers

Zinsco and Zinsco-Sylvania circuit breakers of the design described here do not offer the level of overcurrent and fire protection provided by most other electrical panels and circuit breakers.

Zinsco Panel Field Failure Reports

With the exception of the more seriously failing FPE Stab-Lok electrical panels, we have not received any significant number of field failure reports concerning *other* electrical panel brands that also use aluminum parts and that are or were priced in the same range as Zinsco. This means homes with this equipment may be at greater risk of fire or other electrical hazard.

Zinsco Electrical Panel & Breaker Test Results

Limited test results reported by J. Aronstein indicate that the central Zinsco electrical panel and circuit breaker failure problem appears to be burn ups at the clip-to-bus connections such as shown in our photo of a burned Zinsco electrical panel bus and breaker. The few circuit breakers tested by Dr. Aronstein were reported to trip within normal overcurrent limits. However a circuit breaker whose bus connection burns can lead to overheating damage to the circuit breaker itself, rendering it non-functional.

Photo (left) of a burned and failed Zinsco main circuit breaker, courtesy of J. P. Simmons - Mr. Electric. Simmons adds: "In this case the failure damaged the main wire to a mobile home also (you can see the melted wire to the left of the main). This is a good example of why I do not like to see anyone remove these breakers. You cannot tell how bad they are damaged by looking at them.

Zinsco & Zinsco-Sylvania Panel Replacement Recommended

Where Zinsco and Zinsco-Sylvania electrical panels are discovered in buildings they should be replaced to reduce some very real fire and shock hazards.

Building owners or electricians encountering problems with this equipment are asked to contact us to add that information to our electrical failure data base in an effort to develop accurate safety information which is then shared with appropriate federal and state agencies. Thanks to Mr. James Simmons, a licensed electrician with extensive field experience and the contributor of most of the photos and case reports at this web page.

Where Zinsco electrical panels and Zinsco circuit breakers are in use, arcing, contact-point burn, and even circuit breaker case blow-out have been observed in the field.

Our photo (above left) illustrates a burned-up electrical receptacle whose circuit was *protected* by a Zinsco circuit breaker that failed to trip and in fact had burned itself in the panel.

Zinsco Sylvania Panel Breaker-to-Bus Connection Arcing

A principal Zinsco™ circuit breaker (or Sylvania™ or GTE-Sylvania™ or Kearney™ electrical panel using this circuit breaker) point of failure appears to be at the point of contact where the circuit breaker contacts clip onto the electrical panel bus, combined with the use of an aluminum electrical panel bus.

As described at ZINSCO FAILURE REPORT PROCEDURE, expert testing on this equipment has shown that circuit breakers do not trip about 25% of the time when exposed to overcurrent - risking overheating, fire and other hazards. The failure rate of competitive-brand circuit breakers is much less than 1%.

Readers wanting to read specific advice on what to do if their building contains a Zinsco electrical panel should first read ADVICE FOR ZINSCO OWNERS, then also see ZINSCO FAILURE REPORT PROCEDURE to homeowners when a Zinsco Sylvania™ electrical panel is observed by a contractor, home inspector, or electrician.

In addition to advice on identifying Zinsco™ panels, inspecting Zinsco electrical panels, and repair/replacement advice, we provide field photographs of circuit breaker failures: overheating, burnups, failures to trip, overcurrent protection failure. This document includes field reports of failures and additional anecdotal evidence. See ZINSCO FAILURE PHOTOGRAPHS and ZINSCO FAILURE REPORTS.

Zinsco Panel Repairs

Repair advice (replace the equipment) is provided at ZINSCO REPLACEMENT PANELS and at REPAIR ELECTRICIANS we list electricians who have informed us that they have specific experience with this equipment. Lots of other licensed electricians are also qualified to replace electrical panels; it's best if your electrician is one who is familiar with this issue.

Replacement Zinsco circuit breakers and replacement copper-plated bus bars for Zinsco / Zinsco-Sylvania electrical panels are advertised. Without evidence of a design change in the product or support from independent expert testing, the effectiveness of these replacements is not clear.

As a not-for-profit activity, we have been collecting information and field failure reports for Zinsco/Sylvania electrical components since 1996 in an effort to develop credible failure-rate information which is then shared with the U.S. CPSC and with other electrical failure researchers and educators.

Frequently Asked Questions (FAQs) about Zinsco & Zinsco-Sylvania electrical panels and circuit breakers

Question: I am selling my house and it has a Zinsco electrical panel - are they all a fire hazard risk?

I am selling my house and just had an inspection done. I have a zinsco circuit breaker panel and would like to know is every model the same and are all of the circuit breaker panels a fire hazard risk? - Suzanne

Reply:

Thanks for the important Zinsco breaker model question. We don't know if there are Zinsco-brand circuit breakers whose design is different from the ones discussed here (I don't think so), and we don't yet know if there are age or model differences among Zinsco circuit breakers and their performance, because not enough Zinsco breaker testing has yet been completed.

However it is reasonable to note that because the Zinsco failure reports we've received and physical inspection of that equipment focus attention on the bus and breaker-to-bus-connection design, unless your electrical panel uses a different circuit breaker and bus connection design than the models shown here, it would be prudent to treat your panel as a potential electrical fire and safety hazard.

I appreciate that nobody likes to have any question come up when selling a home. Fortunately, for this particular question, the costs unambiguous - they are confined to the electrical panel and circuit breakers.

House prices vary by region in the U.S. but taking the lowest current average price of $125,000, the cost of a replacement electrical panel should run around one percent or less of the home value - certainly that's not a cost issue that is substantial enough that it should jeopardize the sale.

Question: How do I identify a Zinsco electrical Panel or a Sylvania Zinsco Panel & How do I know if My Panel is Bad?

How do I know if my Sylvania electrical breaker is a Zinsco? – Marie

How do I know if my Sylvania electrical panel is bad? - Wallace

Reply:

Wallace: unfortunately it is not possible nor even safe to try to assure the safety of certain electrical problems by visual inspecting (you can't see hidden problems behind or even inside the circuit breaker) nor by testing in place the circuit breakers (you risk starting a building fire, and even a "tests-ok" breaker may fail the next time it is subjected to an overcurrent). Worse, testing in some cases (FPE in particular) can significantly INCREASE the chances that in the future the breaker will fail to trip.

For that reason, experts recommend replacement of FPE equipment. IN the case of Sylvania equipment ... it depends. If your panel is Zinsco brand, previous burn-ups of breakers are physically visible on disassembly and inspection by an electrician where bus burns and breaker burns can be seen. But that inspection is no assurance that an un-burned component will work as needed in the future. For that reason we also suggest replacing Zinsco panels.

Marie: see IDENTIFY ZINSCO ELECTRICAL PANELS for help in identifying Zinsco brand electrical panels and circuit breakers.

Question: My Zinsco Main Breaker is in the "Off" Position but power is still on in my panel. Help?

Have a Zinsco 100 amp service, turn the main off but still get power have very little cash. So I can't replace it at this time, if I replace the main, is it safe to still use this panel? Is it safe to add new breakers? - Tim

Reply:

Tim:

If you still have power when the main electric panel disconnect is in the "OFF" position then this is a VERY dangerous condition as you cannot, using normal homeowner controls, turn off electrical power in an emergency, and more, it is likely that the main disconnect is not going to trip on a large overcurrent and so is not protecting the equipment and building from an electrical fire.

I'd like to see photos of the equipment and all identifying labels and markings. Use the CONTACT link found at page top, left, or bottom to send us photographs.

Presuming that you don't have a back-fed panel from a second electrical source then you immediately need a licensed electrician to replace the faulty circuit breaker or as I would recommend, replace the entire panel.

"Replacement" Zinsco circuit breakers are certainly sold as well as entire panel bus assembly replacement parts using copper-plated bus bars that might perform better than the original aluminum bus bars - we have not seen any independent supporting study data that confirms that anticipated improvement.

A key ingredient in some Zinsco breaker burn-ups is arcing at the bus to breaker connection. It is difficult or impossible to see the arcing burns before the equipment fails, as disassembly would be required, and because every time a breaker is pulled and removed the bus and even a copper plated bus surface is cut and scratched further, we worry about increasing the arcing and failure rate by examining or plugging breakers in and out.

We might be tempted to say go ahead and replace breakers onto an unused bus position but as you have ALREADY had a very serious fail-to-trip in your Zinsco panel, continuing to use it doesn't sound safe to me. Also see DIRECTORY OF ELECTRICIANS - FPE Zinsco for electricians who assert that they are familiar with Zinsco electrical panel hazards.

Question: Single Breaker Zinsco-Sylvania 100A Main Service Switch feeds a new GE Panel. Isn't this OK?

I have a Sylvania panel on an exterior wall that simply has 100 amp service to the main breaker and then a single 100 amp breaker on the branch that leads to a new GE panel inside the house with its own 100 amp main breaker.

All power comes off of the GE panel. That being said, this seems safe as to take out the Sylvania I would just have a wire from the meter to the GE panel, which would provide no overcurrent protection anyway. With the Zinsco/Sylvania I have two additional breakers to try to trip if for some reason the 100 amp main in the GE failed, plus I can kill power to the GE panel from the outside if ever I needed to in case of a fire.

Does this sounds fine or is the Sylvania still a problem? - Bob Welderman

Reply: The service entry cable between meter and new panel may be under-protected

Bob,

If I understand correctly, because you find that the outside Zinsco/Sylvania panel simply duplicates the main breaker on the inside panel you figure it's safe to leave it in place.

Here are some concerns with that approach:

1. The outside panel and breaker is protecting the SEC feeder wire between the meter and the inside panel. Depending on the inside panel distance from the meter and location and wire routing, that protection could be important and even code required. So you want that protection to be reliable. Though a problem with an indoor individual circuit is more likely, failures do occur on the SEC wire, including shorts and overheating that can lead to a fire.

2. Leaving in place a circuit breaker that has frequent bus arcing and overheating could be more dangerous than just the point above: the product you leave in place cannot just fail to respond to an overcurrent, it can initiate a problem by overheating, arcing, burning itself.

Dan

Reader Follow-Up:

Thank you for the response. To be more specific. The wire from the meter to the Sylvania is about 4 feet and then the one from the Sylvania to the GE is about 4-6 feet as it is just on the other side of the wall. The breaker from the Sylvania to the GE is a brand new refurbished one that was tested by the electrical supplier about a year ago. - Bob.

Comment: testing by the electrical supplier? Unusual. But the basic electrical failure risk remains.

Bob, in the arrangement you've described, it is the SEC between the Zinsco-Sylvania breaker and the new GE panel that is left unprotected should a short occur in that wire or should the main breaker in the GE panel fail to trip. I agree that the risk that remains in those components is likely to be lower in frequency than risks of the need to trip a circuit breaker protecting an individual branch circuit in the building. However, because of the chances of a higher current draw at a major failure in a panel or in an SEC, the protection of that wiring is very important. Indeed we attended a house fire that occurred in just those circumstances - an SEC or main panel short.

1. It is very unusual to read that an electrical supplier is performing testing on circuit breakers, and one is left wondering just what testing of tests were performed, to what standard, and with what scope and reliability. For example some electricians will "test" a breaker by applying a dead short and observing that it trips.

   Circuit breaker standards, including the partially inadequate (in my OPINION) UL 486 specify that circuit breakers are tested at different overcurrent levels. A breaker is given more time to trip at a lower overcurrent than at a higher one. If your supplier is actually testing to standards the test might be reliable - we'd sure like to see any documentation on what is being done (use the CONTACT link found on any of our pages to send us that information if you can obtain it).

2. Even if the breaker was tested and appeared to perform successfully, some important warnings pertain. Presuming we are talking about a Zinsco-Sylvania product, the failures that occur most often are at the breaker clip - to - panel bus bar connection. Arcing and overheating appears to occur there - hidden from easy view without disassembling the equipment.

   Therefore even if a breaker starts out in healthy good operating condition, the in-service conditions can create a serious failure whose point of origin is actually outside the breaker and inherent in the combination of materials used and design of the breaker-to-bus connector - not something that is adequately addressed by testing the

breaker alone, nor would it be adequately addressed by a short term breaker test mounted in a panel. Rather, arcing that occurs at an in-use breaker and panel over time seems to be the failure source.

Just to be clear, the main switch protects equipment that is *downstream* from itself.

At this point, if I understand your schema, the service entry cable passes from meter to Zinsco-Sylvania breaker and from there to a main panel of another brand. So the risk of a no-trip or burn up in the service panel is less than before when Zinsco breakers were in use in that location.

Nevertheless, it's the main switch that does the heavy lifting when safety and shorts are concerned.

Question: where can I buy replacement electrical panel covers for a Zinsco ?

looking for two electric panel covers for Zinsco 14" w x 20 L - Hank Vance

Reply:

Hank, take a look at the article ZINSCO REPLACEMENT PANELS - This article describes replacement electrical panels and covers.

Question: was there a Sylvania Panel recall?

Sylvania Panel GRTE, 390-205-08, 380-025-15, e-52977, albiz (20-20)-c. Home Inspection comments this could be a recall item. Please advise 650-576-0777 Thank you, B Oliveira - 12/19/11

Reply:

Brenda, I'm not sure what advice you are asking; please be sure to read the above articles on the hazards of Zinsco and Zinsco-Sylvania electrical panels and circuit breakers. Simply deciding on the presence or absence of a safety hazard based on whether or not there was a product recall is unreliable.

Question: What is Sylvania-Zinsco's responsibility for a faulty product?

What is Sylvania-Zinsco's responsibility for a faulty product? Were there any recall notices? Is there any compensation for their faulty product? - G Butler 5/7/12

Reply:

Mr. Butler:

The assignment of responsibility for product defects is a legal and technical question that we InspectAPedia do not directly address. We report on building and environmental inspection, diagnosis, and repair topics with as much impartiality as possible. I agree that it's a fair question nevertheless, and as with other controversial product defects such as the FPE Stab-Lok hazard, we will report if there are product recalls or legal actions in the matter.

Keep in mind that in all fields there can be defective or hazardous products notwithstanding the existence of regulatory bodies and the court structure. By comparison, crimes occur even though there are law enforcement and a legal justice system.

Question: where do I find a licensed electrician to do Zinsco Panel Replacements?

Where to find licensed electrician for Zinsco panel in my area - David Rue 5/16/12

Reply:

David, ANY licensed electrician can replace a Zinsco electrical panel. The reason we like to use electricians who know about the Zinsco hazard is to avoid wasting time with someone who makes the mistake of telling you there is no possible hazard.

At DIRECTORY OF ELECTRICIANS we list some, not all, electricians who assert that they have experience with Aluminum wiring, FPE, and Zinsco electrical equipment repairs or replacements. There are no listing fees and InspectApedia has no business nor other financial relations with any topic or service provider discussed here.

Question: Zinsco Field Failure Report 7/15/12

I am a Master Electrician in Florida. I recently received a call from a customer who was having a new central A/C installed. The Installer told him that the Main 100A Zinsco breaker was turned off, but the house still had power. I assessed the situation, and told the homeowner he needed a service change. I would not even attempt to touch the service disconnect. I had the Power Company disconnect the power at the transformer, before I started. When it was safe, I attempted to remove the old Zinsco breaker, and it crumbled in my hands. If someone had attempted to work the breaker they would have been subject to a terrific arc flash - burn - explosion. I,m glad I took the safety first approach. Hank Kline DeBary FL. - Hank Kline 7/15/2012

Reply:

Thanks so much for your important Zinsco field failure report Hank. It illustrates how one real-world experience is worth a dozen arm-waving speculations from a few writers who think we've made the whole thing up. Glad you knew to be safe.

Indeed, though it was from a different root cause, a GA electrician was killed simply in the course of removing the cover from an electrical panel. The release of the cover screws allowed faulty components in that panel to move, shorting and causing an arc explosion that blew the cover and panel parts into him. I've also received reports of workers burned from situations such as the one you described.

If you come across iffy products like this again and have an opportunity to take a photo to show other readers it'd be helpful; also we welcome questions & content suggestions from everyone, but from an experienced master electrician your views are particularly helpful.

Best, Daniel

Question: is there a recall on Zinsco Electrical Panels / Circuit Breakers - or recourse?

Is there a recall or some recourse from the company that manufactured the faulty Zinsco Electric Panel / Circuit Breaker? Do you have a contact for the company? Thanks! - Cynthia 7/23/12

Reply:

Sorry, Cynthia, no.

Question: is it safe to replace a Zinsco-design electrical panel if I have the electric company drop power at the meter?

I have a Zinsco Panel it is listed as a Sylvania but looks exactly like the photo above. I have a friend that is a electrician and told me he would replace the panel with a new square D 200 amp service. If I have the power company turn my meter off then no power will be running through the panel how is this job still dangerous? - Ryan 8/23/2012

Reply:

Ryan,

If your electrician friend is qualified and knows what s/he is doing, and if power is dropped at the meter, the job MIGHT be not dangerous. I say might because an electrician who failed to confirm that power was off risks being killed by

electrocution, and a time or two I've found that electrical power was not off when we thouht it was.

The second hazard would be if wiring were not done correctly - which is therefore unsafe.

In sum, if the work is done by someone qualified and properly then the job is being handled properly.

Question: Reader comment: burned-up Zinsco Circuit Breaker Photos

I manage the electrical department at a hardware store, and a customer brought in the breaker in the photos, looking for a replacement.

We suggested they immediately get a licensed electrician to come out and replace the panel, but they just wanted to replace the breaker, worryingly enough.

The truly scary part, though, is that apparently this breaker was not the one that originally failed, it was set on fire by the failure of the adjacent breaker. One can only imagine what that one must have looked like, if there was anything left of it.

Feel free to include the photos in the Zinsco section of the website, if you'd like. I think I may end up making a display case in the store for this and a similarly failed FPE breaker. Maybe it'll give people a hint as to why we recommend that they replace these panels.

On a somewhat related note, I regularly recommend your site to customers with electrical safety questions, as does my father (a licensed electrician with over 40 years in the industry). Thanks for all the work you've put into it, and for trying to bring electrical safety issues to people's attention. - A.K.

Reply:

Dear A.K.

Thank you for the Zinsco burn-up photos and the case report of another Zinsco circuit breaker failure. Your report is a reminder of Aronstein's frequent caveat that unless the remains of a fire are examined by a very expert forensic expert, we cannot always be sure exactly what went wrong.

Nevertheless in the case you describe, and considering that based on an impartial review of the history of Zinsco product failures and field reports, our OPINION is that the product is defective, suffering from both design and performance issues.

What that fancy talk means in plain English is that simply installing a "replacement breaker" into a Zinsco panel is not a safe repair since it does nothing to address the design and product failure issues in the product. As with a few other replacement circuit breaker lines like FPE, there is unfortunately not a shred of independent test data nor field data that would support just replacing the breaker. Replacing the panel is what one should recommend.

The stumbling block for electricians and their customers is that too often all the customer has noticed is that power has been lost on one or two circuits in the building (where a breaker melted or failed to trip until the circuit wiring burned up). The customer figures that "all I need is a new $7.00 circuit breaker" and treats with suspicion the electricians' suggestion that the panel should be replaced.

To offer impartial assistance in problems like this you are welcome to provide your customers with printed copies of InspectApedia articles that you find helpful, and for a few cases listed just below we also provide special web pages that can be freely copied to other websites so long as they are not modified without our permission. Your email prompted us to make a new hazard summary page for Zinsco, Kearney, Zinsco-Sylvania electrical panels & circuit breakers. I've also added your Zinsco burn-up photos here and your report and photos appear also at ZINSCO FAILURE REPORTS as well as at ZINSCO Hazard Summary Page for Reproduction.

- Aluminum Wiring Summary Page for Public Use - aluminum wiring warning summary
- FPE Stab-Lok® Hazard Summary Page for Reproduction - Federal Pacific Electric Stab-Lok breakers & panels summary
- ZINSCO Hazard Summary Page for Reproduction - Zinsco Circuit Breaker & Panel Hazards [New 3/10/2013]

CONTACT US if you have suggestions for that material or if you have questions or content suggestions about other material at InspectApedia. Working together we're smarter than working alone. Thanks again, Daniel

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