



## Behind the Wheels Podcast Transcription

### Season 2, Episode 9

## Heat Indicator: Learn How Heat Buildup Impacts Your Wheels

#### ANNOUNCER

You're listening to Behind the Wheels with Doug Mason, Dave Walters, and Mike Yagley. This is a show where we talk about heavy truck and medium duty axle ends. Doug, Dave, and Mike bring close to 100 years of experience and expertise in the transportation business.

Join us once a month to learn new things about axle ends. Sponsored by Alcoa® Wheels, the global leader in aluminum wheel innovation.

#### MIKE YAGLEY

Welcome to another episode of Behind the Wheels. I'm Mike Yagley.

#### DOUG MASON

I'm Doug Mason.

#### DAVE WALTERS

And I'm Dave Walters.

#### MIKE YAGLEY

One of the things that we hear a lot about from the field, get a lot of questions on heat; if your wheel gets hot, how do you manage that? How do you know what happened? And what do you do? We've had a couple of episodes already; we've talked previously about small wheels, and that is really where it all starts, but this is going to be talking about just the way to identify what we call the heat indicators. Now let's take a step back, and we'll talk just for a minute on the issue, what can heat do to a wheel? Why do wheel manufacturers, specifically Alcoa wheels, have heat indicators on their wheels? Doug, do you want to cover that?

#### DOUG MASON

Yes, sure. Thanks, Mike. And really, the main issue is you're talking about aluminum that has been we'll call heat treated, its strength is imparted by going through a special thermal process. If you take the wheel to too high of a temperature, you can start to undo some of the strengthening that has occurred during the typical processing of the part. And so it's important to know what kind of thermal events a wheel has gone through. There's many types of things that can occur, from breaks to tire fires, to all kinds of things. And it's important to know whether or not that wheel is still in a condition that can and be used, or if there'll be a concern with it. And that's where you were talking about the small wheels.

#### DOUG MASON

If you basically take a wheel, the temper out of it, people would think of it as a temper, perhaps, out of the wheel, you lose strength, and then the open end can reduce in size, and there is a potential for the tire to not seat properly, and possibly come right off and have a high deflation rate, we'll call it, event, which we do not want to occur. And so that's really the main issue that comes about by that, and Dave, I think you've seen a number of heat issues in the field; maybe you can just touch on a few of those as well, from a practical perspective.



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#### DAVE WALTERS

What I always tell people on the field when we have a lot of different types of braking systems, and really what we had to do was come up with a measurement. So the measurement of our heat indicators are 400 degrees for five minutes, and it turns these stickers brown, and then if it becomes black, we tell you that should be taken out to service. But because of the breaking we've seen, even Squiller Band ( ABS Tone Ring) can start activating, wheeler bands can start activating the brake system. And if you build up temperatures, and I'll give you a temperature the tire guys have told me time and time again, you get up to 295 degrees, you're going to start affecting the bead of the tire. Now the good thing about it is a steel, or aluminum wheel can go past that temperature, but at 400 degrees for five minutes is when you could have an issue with the wheel.

#### DAVE WALTERS

So I always tell people in the field, if you're having beads burn up, you better be looking at the wheel also because that wheel's taking a lot of heat too. So it's a dual sword there; the tires will go first, but if you're having tire issues with bead issues, definitely start looking into the wheel and seeing how much heat the wheel's getting.

#### MIKE YAGLEY

Now, Dave, you mentioned the 400 degrees for five minutes is where we start getting a little worried about the wheel, but the heat indicators out there, especially the Alcoa wheels' heat indicator, is a little different than that. When we were designing the heat indicator, it was a function of both time and temperature. So, you could have a very high temperature and would turn that heat indicator black almost immediately, or you could have a relatively low temperature over a long time, and you would start seeing that heat indicator turn black. And that's what causes a lot of questions out in the field where customers will see a heat indicator on their wheel, and it's turned black, they check the wheel, they make sure it's okay, and it is, and we'll talk about how that happens in a minute. They ask us, well, what to do with that? If they have a darkened heat indicator, but the wheel is still good. What do you tell them there, Dave?

#### DAVE WALTERS

In the Alcoa service manual, and we've also written an RP at TMC about it is, there's different types of measurements you can do. In our service manual states, there's the best; there's better, better best, this is the spring, so you have nothing else you can do. If you have a flat surface and you can roll the wheel, if the wheel starts to turn, and it's always going to turn to the open end, then you know you have an issue. And we always tell somebody, it should be about eight feet, but it has to be a flat surface. If you don't have a flat surface, the next best method is simply a carpenter square. They're very cheap; you can get them at any hardware store. And if the carpenter square goes up and over the wheel, you can put that on the face of the wheel and basically make sure you cannot fit 30,000s in between the open end and the carpenter square.

#### DAVE WALTERS

And 30,000s is about as thickness of a credit card, driver's license, something like that, but some people don't have feeler gauges. And we want you to at least check that in four spots. And so there's the next method. The best method is to buy a PRA tape, and they're basically made to measure the max, the min, and here's right in the center. And they're by far the best tools, but unfortunately, they cost some money. And if a tire dealer running a hundred and plus service trucks, they really don't want to put it a hundred and some of these out in the service trucks. So they'll probably put a \$7 carpenter square on every one of their trucks, but not the other one. So there's really three methods that we go to at TMC and that we publish in the Alcoa service manual.

#### DOUG MASON

Yeah. And if you, Dave, just to [crosstalk 00:07:17] follow up on that with the service manual, obviously, that's online for anybody who's listening. And in that, you'd see very clear pictures of what Dave is describing, and it makes it very simple how that would be applied. Also, if you are interested in the tire and rim ball tape, there is an address and information where you could reach the tire rim association for that equipment. So I just wanted to throw that in there.

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##### MIKE YAGLEY

Just to recap, the very best way to measure and the way we do it in our plants is we use that ball tape. That is like Dave called it earlier; that is the supreme method. That is really the way to go. That gives you real accurate information. Unfortunately, those ball tapes are expensive, and a lot of people wouldn't be using them very often. And so the next best method is the carpenter square. And that carpenter square is like, Doug mentioned it, how to use it is in the service manual. There's some pictures in there.

##### MIKE YAGLEY

And if you don't have either one of those, then just roll that wheel on a flat surface. And if it can't keep on a straight line, then you have a problem. If it goes off really quickly to the open end. And all of those, basically the getting back to the heat indicator, the heat is a signal. When that heat indicator turns black, it's a signal to do one of those three tests to find out if you have a good wheel. If you have a good wheel, what do you do next? Dave, do you want to take that one?

##### DAVE WALTERS

Yeah. Technically what I tell anybody, this is the way I tell anybody in the field, if you even see brown, measure the wheel; it's always about safety first. So figure it to make sure it's good. Black, definitely measure it. And those are really the things... Using one of these processes to do that. It's giant safety because if you put a tire on a small wheel, that tire's going to come off. And if you're in a safety cage and following OSHA regulations, okay, we're okay. But unfortunately, we've had some in the field that people did not follow OSHA regulations; the tire comes off, and bad things can happen. So, I tell somebody it's very quick to put a carpenter square in four spots and measure around a wheel. So basically, safety issues. If you see brown, measure it. If you see any tire issues with the beads, measure it.

##### MIKE YAGLEY

Right. We've gotten a lot of questions coming in from customers. The heat indicators, the wheel is good, but the heat indicators turn black. They want to replace the heat indicator. They want to put a new one on, or the heat indicator has fallen off, or they're buying another supplier's wheel. And they would like to put a heat indicator onto that wheel. So they have some sort of methodology to an indication of when to check that wheel. Any thoughts there?

##### DOUG MASON

Yeah, that becomes a really kind of legal issue. Obviously, when we put the initial heat indicator label on there, the wheel has not seen any thermal events at all, and you're going to see accumulation, as you noted, of the thermal events in that sticker heat indicator. If it is removed or lost or comes to a point where, really, you can't see any more change in it and the wheel is still good, they cannot be replaced with one from Alcoa wheels. There are some out on the market that can be used that can be put on the wheel. And then, the current owner can continue to evaluate the thermal events that are going on in the wheel-tire itself. But that's really the only way that that can be added. It cannot come from; it'll say the OEM sticker, OEM heat indicator label because the history would be lost if that's put on the wheel afterward. And that would not be appropriate from a life history of the wheel. I don't know if that answers the question, Mike.

##### MIKE YAGLEY

Yeah. Do we have any guidance? If people are out there looking for heat indicator stickers in the aftermarket date.

##### DAVE WALTERS

Really the biggest thing you have to know is when you look at aftermarket heat indicators, you got to understand they come in ranges. So there's not one that comes from 200 degrees to 400 degrees. So you'll have to get one. They mostly come in about 50 degrees to 60 degrees range. If you're measuring, if the wheel's going to be damaged, you're going to need one that's probably 350 and above.

##### DOUG MASON

Yeah. Correct.

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##### DAVE WALTERS

Measuring one, you want to see if the tire reached what temperature, then you're probably going to do a 240 to 290 or something like that. So just understand there's different ranges. There wouldn't be any problem of running, one for the tire and one for the wheel. If that's what you're trying to look at. There's ranges they work very well for years; when we did heat studies with the tire companies, we used them quite a bit. And that gives you a good max temperature range.

##### DOUG MASON

I guess one other thing to throw in there we didn't mention. And I think most people who would buy our wheels may know this, but there are two heat indicator labels on the wheel. There's one on the open-end brake side, I'm sorry. And near the roll stamp. And then there's also one in the tire side and the tire cavity area in the drop wall of the wheel. Many only see the one is on the outside, and if they lose that one, they think that that's it. But there is also a second one that is inside the tire chamber that can also be evaluated. So there are two, we'll say almost redundant. They are in different areas for different reasons, but you would still have the availability of both.

##### MIKE YAGLEY

So I'm just going to quickly recap, again, like Dave mentioned safety first. The whole point of that heat indicator is to make sure the wheel is safe and should be a signal for the maintenance organization. If that heat indicator turns brown, certainly if it turns black, check the wheel; if you want to get a new heat indicator, you cannot get that from Alcoa wheels, but you can buy the aftermarket ones. Those aftermarket ones come in all sorts of different temperatures. You can get one, you might want to get one for the tire that would be in the 290 range, and you might want to get one for the wheel, which would be a little bit higher, 350 to 400.

##### MIKE YAGLEY

That's sort of the quick overview. We get a lot of questions on heat indicators. So we thought we'd address that.

##### MIKE YAGLEY

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