FTC Care Labeling Rule Roundtable
March 28, 2014
Segment 2
Transcript

SPEAKER 1: Well, we will now hear from our second presenter, Charles Riggs, from Texas Woman's University.

CHARLES RIGGS: Good morning. Peter didn't mention, this is probably a continuation of the October 1 meeting on the sidewalk. There were about a dozen of us here. No one from FTC or the government of course, and we had some discussion, but--

SPEAKER 2: Sir, I apologize, I have to make one announcement. Somebody left a wedding ring when they went through security. And if you did that you should go out and grab it now. My wife would kill me if I did that. So it's a ladies wedding ring. They also put a bracelet through, and picked up the bracelet, but not the ring. OK, I'm sorry, sir.

CHARLES RIGGS: I would have expected to see somebody leaving in a panic. No? Don't go home without it, right?

I've been involved in this industry, cleaning industry, for, well, I guess I'm now starting year 41 through the University. My background is in chemistry, and that led to teaching in textiles and in chemistry, and I still do both. I'm two people on campus. Professor of textiles in one building, and professor of chemistry in another building.

We've had a long history of working initially with funding from the state of Texas. With a look at, how do we help to promote the use of fibers grown in the state of Texas? Which was cotton, wool, and mohair, primarily. And of course, in the cleaning process, that means laundering and dry cleaning, so we've been involved in both. Still involved in both.

For about 20 of those years, we had a plant on campus. Which, we actually did production work-- well, I didn't-- but we had a staff that did production work. Took in cleaning for a fee.

And at the same time, under my direction, we would do controlled research studies. Looking at different cleaning parameters for different kinds of fibers. Both dry cleaning and laundering. At one time, we had the most recent model of a wet cleaning machine, and the newest model of a hydrocarbon dry cleaning machine, and the newest model of a perchloroethylene dry cleaning machine.

So we had a chance to do some very good comparative studies backed up with laboratory test data. Including a project funded by EPA through Design for Environment, in partnership with North Carolina State University. So I at TWU, and Manfred Wentz through NCSU, did a lot of data.

And we got involved in the wet cleaning process, actually, not too long after the Europeans began doing it. Wet cleaning is not new to the professional care industry. As far as I know it goes back to at least 1940. And probably before that.

Because you will look-- and so what I'll show you, demonstrate is, it was an essential part of the professional care industry. That is, you could not just use solvents, you also had to use water. Though wet cleaning was often practiced as a scrub-board type process as an adjunct to dry cleaning. In particular, for certain kinds of soils and fabric combinations. That's what I wanted to address today, is, what are our limitations when we start looking at fabrics and soils and wet cleaning or dry cleaning?

So these are the care symbols that-- I think this is the ASTM set. And during part of that time I was also involved with-- this is ASTM D13, I serve on that committee. This was also worked on little bit different symbols in ISO 3758, and I was on that committee also. And then through AATCC, we activated RA 43, which is a professional care test methods for American Association of Textile Chemists and Colorists. And Manfred Wentz and I, for a few years, rotated. He would chair for period, I was secretary, then we'd reverse roles.

So we looked heavily at the test methods. At the 1999 Roundtable, wet cleaning was discussed. And at that time, it wasn't a viable option even to allow the label, because we didn't have a definition for it. Furthermore we didn't have a test method. And rightly so, you needed both.

So I was very much involved in that process. I think in several things, I was the only US delegate there. Through ISO 3175 part four, what's added, which is professional wet cleaning. ISO 3175 parts two and three, I'll get the numbers reversed, one is for perchloroethylene cleaning, one is for hydrocarbon cleaning. And there may be other methods yet to be added as we look at new solvents coming into the industry.

3174 is where we work from a standardized definition and a backing up test method. So that method is there, and that definition is there. And in fact, if you were to test for labels, the way to test for the labels would not be to take it to the corner wet cleaner. It would need to be tested according to ISO 3175, part four. Standardized test method. We were involved with Europe in doing the inter-laboratory correlations, and you get results that do indeed correlate.

So I put these up here, and I think it's going to come up probably during panel discussion. One of the differences between ASTM set, FTC rules, and the ISO, is the use of this Saint Andrew's Cross. FTC requires a reasonable basis, ISO does not.

OK, let me get to the heart of the subject. Here's a typical dry cleaning machine, front and back. It's quite different than what was used in the old days, which led to a lot of environmental pollution.

These machines have no connection to the water. They are standalone machines, they have a steam connection, electrical connection, and everything is self-contained in the machine. All waste is removed from the machine in special containers, solvents delivered and retained in the

machine. The back of it contains filtering processes for cleaning the solvent, and in most cases, and certainly in the recommended cases, a distillation unit for purifying the solvent.

Wet cleaning machine looks pretty similar, except we do have connections to water and sewer. Because, of course, the water is what's used and the products removed in wet cleaning go to the sewer. Transferred to a dryer, and the dryer requires some special conditioning. And the term wet cleaning has become, now, to me, this particular wet cleaning machine and drying process. As opposed to the drycleaner using the scrub board to handle certain kinds of soils.

So I'm gonna look at expectations for a cleaning process. If you're in the professional cleaning business, your customers have two major expectations. One is they want to get it clean.

I keep-- is that better over there at the side? All right, is it picking up all right? All right.

And, same time you want to avoid damage to the item. So I wanted to look at those two factors, and look at what happens in both water and solvents in determining soil removal and protecting the garment.

For the dry cleaning process, well, for any cleaning process, we've got two choices. Peter had this, I think, on his slide also. Aqueous solvent using water. Now, I want to talk about the chemical nature of that. That's a molecule that is, we would describe, as being polar in nature. That is, if you look at the molecule from a chemical basis, there is a separation of positive and negative charges on that molecule. So it's polar.

The non-aqueous solvents are, for the most part, nonpolar. The ones most widely used would be petroleum, or nitro or synthetic petroleum solvents, tetrachloroethylene, that would also include silicone fluids, and I'm now seeing a number of new alternatives. I was exposed to one just recently, dibutoxymethane, which looks like a very interesting solvent. But all of them would have this characteristic of not being a polar molecule.

Now, let's go back to the damage situation for a minute. In solvent cleaning, one of the issues is odor retention. It's solved primarily by newer techniques and newer machines for keeping the solvents clean and pure. There are some kinds of trends, especially polystyrene beads and sequence, that are solvent sensitive that you'd have to be cautious for and test for, and perhaps label those to avoid certain types of solvents. Perchloroethylene being the most aggressive.

In the case of water, the biggest issue we have is shrinkage. Loss of color is more prevalent in the water than it is in solvent. And that loss of color could promote bleeding. It seems that a very popular fashion trend is to have contrasting dark and light fabrics in the same garment. And that's a real issue when it comes to bleeding the dark color on to the lighter color. Black and white is a very fashionable look, it's also a very difficult look to clean.

And then we have some change in surface character, typically with water. I seem to be stuck on the same slide. Uh-oh, that wasn't the right button. Well I'll get to it that way, I guess.

I want to talk about this issue of shrinkage, which we find more common in water. And there are actually two types of shrinkage we would deal with in textiles. One is relaxation shrinkage. And this comes from fabric that has been processed, usually wet. And in the processing, the fabric is stretched. It may, in fact, be in an elongated, stretched state when you buy a new garment.

Water is a very relaxing bath, and we tend to find that that fiber that was elongated now relaxes, and comes back to what would have been a normal length. With the customer very happy, they saw a change of one or two sizes in their garment. The warmer the water, the faster the relaxation. Once you get this relaxation shrinkage relaxed, back to original length, then it stops. And you would live with a stable fabric. That is, unless you stretch it out again.

I know my students on campus love their denim jeans to fit tight, and they buy them tight. And when they wash them, they relax, and they struggle to get them on. End of the day, they're elongated again, and so they're nice and comfortable, but, next time it's washed, it relaxes again. So this could be a repeating process for tight fitting garments. But if you buy something new, and it's been elongated at the mill, you observe shrinkage in a brand new garment. Not to anyone's fault, except for the fact that the fabric was elongated.

The other type of shrinkage is progressive. This is where we have something that the fiber is sensitive to, and once exposed to that, it causes the fiber to actually shorten in length. And this continues for some fibers on an indefinite basis. Wool being one of those, that you could start with a sweater, and progressively shrink it to a tightly knotted ball. So part of our issue in the cleaning process, is controlling these different types of shrinkage. We seem to have to-- OK.

The other thing I would look at are this whole process of getting things clean. You won't be a professional cleaner if you don't accomplish this goal of removing the soils. Some soils simply require agitation. We think of sawdust, loose sand, you just shake it out of the fabric and it's gone. There are some soils which will dissolve in water. And not much else is involved.

And in fact, it's the chemistry that matches. When you have a polar solvent, if the soil is polar, it tends to dissolve in that solvent, and it's readily removed. So if we match them up, polar solvents for water, easily removed. Salt, sugars, blood, urine, most body fluids.

Nonpolar solvent, or nonpolar soils, which would be things like oils, greases, fats, and waxes, are hard to remove in a polar solvent. So if you have water, you're going to have a hard time getting out oils, greases, fats, and waxes. So you add different kinds of detergents, which certainly help in the process. The particular soils, not soluble, and they're going to come out shaking.

The stains we would classify as something different. These are chemically bound to the fabric, and you must do some kind of a chemical treatment to reduce the color of this stain to make it either soluble, or no longer showing its color characteristics. Some stains are professionally removed before cleaning, some are removed after cleaning.

If I could have you go through it twice, once with the remote and once with the cursor.

So in terms of getting things cleaned, and what professional cleaners have known since 1940 and before, you need to match the chemistry to the soil. So if you're a drycleaner, you would have no problem with the nonpolar soils. You would have a problem with the polar soils. That is, match the two up. If the soil readily dissolves in water, it's a problem in dry cleaning. If it readily dissolves in solvent, it's a problem in washing.

So, give you a view ahead to the final statement, in our studies we have found that you actually need access to both technologies. If you want to get all wide range of soils out, you need some water chemistry when you're doing dry cleaning with solvents. If you're doing wet cleaning, you need some solvent chemistry when you're wet cleaning with water. And the professional cleaner would then rely upon their knowledge of soil type to do the appropriate thing for that particular type soil.

In wet cleaning we would find just the opposite. No problem with polar soils, our problem comes from the nonpolar soils. And we would have to add special detergents and multipliers and so on. And [INAUDIBLE], [INAUDIBLE] those oily soils which could become an environmental issue. If you are pre-spotting in wet cleaning with a solvent, and then you put that pre-spotted item into the wet cleaning machine, you have now added solvents to the water. Which is not allowed, or should not be allowed.

So again, you need a knowledge of soil type that's present to make a decision as to, should you use water on this, or should you use a solvent. Click through again. I must have built these slides wrong.

OK, so, I know in some of the news reports of this roundtable, where they talked about wet cleaning as being an environmentally friendly process, which I'll address later. But let's look at the environmental issues with dry cleaning. The process goes back to the 1800s.

Initial quality of the solvent was poor, but still, recycling was part of the standard practice. You would capture and reuse the solvent. But there was no method for disposing of dirty solvent or removed soils. So typically, this was done wherever you could dump it. And at that time, certainly was not illegal. And so we had a lot of contaminated sites that we're now cleaning up where that was dumped on the ground, or heaven forbid, got into the waterway. But, you know, some issues with now cleaning that up--

Now, the risk is certainly minimized with the modern machines and the modern technology. Problem water soluble soils removed by hand wet cleaning. Probably going back to, I can't document, but I would say back in the 1800s, probably. You would realize very quickly that some things coming in simply didn't come out with solvent, you needed to treat them with water either before or after the process. Had to be done that way.

I wanted to show you this one. We found in our studies comparing the three machines, the wet cleaning machine, the [INAUDIBLE] machine, and the hydrocarbon machine. And this was part of the international, inter-laboratory correlations. We used a IWS-- International Wool Secretariat-- test fabric.

And so here's the situation. You can take a wool fiber and talk about it as a fabric, a fiber, not a fabric. And you can elongate it. It will stretch. It doesn't recover very fast, and it doesn't recover completely. So wool in fabrics, quite often, is elongated.

If you increase the humidity, you would speed up that recovery process. In addition, the fiber has scales. I think you can see the cross-section down there that clearly shows the fiber, which are part of our issue with wool. When we expose wool to a combination of heat, moisture, and agitation, which is what you would need to get clean using water, these fibers will migrate or withdraw towards the rut end.

And then those scales can overlap, interlock, and you can't re-extend them. Also, the tip of the fiber becomes mobile, and would inter-tangle with adjacent fibers and adjacent yarns in a process that we would call felting. Which could be desirable if you want to make a felt fabric, but if you have a sweater, you don't want to felt it in the cleaning process.

Here are some examples of different animal hair fibers and some other fibers that would not be issues. But you can see the coarser the texture of the scale, the more the problem you're going to have with that fiber shortening and not be able to recover. Now what can happen with wet cleaning tension equipment, is we could get some felting, we could stretch it out, but we've now replaced a fiber shrinkage issue with a relaxation issue. So the second time it comes back it would relax and felt some more.

Third time, we may not be able to tension it back. And that was our test criteria. ISO 3175 requires a three cycle process to test for compatibility of wet cleaning.

So the history goes. So a traditional wool fabric, you would dry clean it. Had to be concerned about moisture levels. And if it had soils that required a water solvent removal process, you would wet clean it by hand. And wet cleaning, you can do wool. Very mild detergent, minimal mechanical action. In fact, the wet cleaning cycle spends a tremendous amount of time in a soaking cycle, and not much time in rotation and agitation.

Which means you get less mechanical action to remove the soil, because you want to minimize that to avoid the damage to the wool fabric. You get some relaxation still, and you can get some felting. You might recover that by elongation, but that's going to be progressive. Every time you do it you're going to get more felting and less ability to elongate. So after multiple cleanings, you may lose the ability to wet clean it another time. Or it may begin to change in size uncontrollably.

I apologize for these repeating items. Not sure what's happening there.

There are some washable wool fabrics. Which could be an industry trend, but it's been proposed for years and success has been limited. And the way you do that is actually change the character of the fiber. You could chemically remove some of the scale structure, but then you change the way it feels. And you could coat the scales of the finish, which also changes the way it feels and the way it would breathe. So to make wool more wet cleanable, we would have issues in terms of

hand of the fabric, degrading the durability of the fabric, and then, the alkali found in most laundry detergents would also attack the wool protein.

So here's a summary. Again, back to dry cleaning-- current technology-- no connection to the sewer. So all solvents, soils, and additives are captured, filtered, distilled. The solvent is reused in the same machine. Going through filtering distillation steps, and properly done, the reused solvent is as pure and clear as the new solvent would be.

This is getting to be rather amazing. Current dry cleaning technology, with this reuse technology, typically one gallon of solvent lost for every 1,000 pounds cleaned. That's a conservative number. I'm hearing from the people promoting this new solvent I mentioned-- dibutoxymethane-- that they're pushing 5,000 pounds per gallon. So, where does this gallon go? It's lost, but we can talk about where it likely is.

In wet cleaning, we use water to remove those soluble soils. And then the discharge soils and detergents we need to handle the others are discharged to the sewer. And the ISO test method is based upon using water at a temperature of 85 to 104 degrees. And the typical consumption, in fact, the fabric to liquor ratio is specified. 2.4 gallons of water per pound of fabric wet cleaned. So if you were to compare the two, let's see, that 1,000 pounds of dry cleaning that uses a gallon of solvent would take 2400 gallons of water.

Back to it repeating.

So what's environmentally friendly? Washing wet cleaning using water, which in some areas is becoming a precious commodity with droughts coming in. In particular, the water is primary that that comes out of the drinking supply. And then the discharge, soils, detergents, and if it's pre-spotting, solvents, perhaps, to the sewer.

Dry-to-dry dry cleaning machines-- actually, this cleans and dries in the same machine-- the soils and detergents are concentrated, and then they're disposed of by licensed hazardous-waste handlers. So you package the soil and detergents that you've used and removed, into a small container and get rid of them.

It may not show as gross as I would like for it to. This is the back of a dry cleaning machine. It's connected to a waste drum-- which would normally not be opened-- opened for taking the picture. I think it's interesting to take students on a tour and show them this, and they're all disgusted. And this is coming out of the back of this dry cleaning machine. And they're all disgusted and think that's just a terrible thing to do. And then I point out to them, well, if you wash it or wet clean it, this is what goes in the sewer.

One particular plant I visited recently is doing workwear from the oil fields. Combination of polar soils and nonpolar soils. A lot of grease from the drilling, a lot of perspiration, a lot of dirt. Got all kinds of soils in there. Particulate and so on. So it's a problem for all technologies.

If you use water, you're struggling with the oils and greases. If you use solvents, you're struggling with the perspiration. So what do they do?

Well, you could do some industrial laundry. And we work with that industry too. In fact, we do more with that industry than we do in dry cleaning. Industrial laundry is actually prepared to handle this using water.

I wouldn't call this wet cleaning, because this is extremely aggressive chemistry. High temperatures, and these laundries also have on-premise waste water pre-treatment facilities, so it's a different type of regulation issue. That's one possibility.

That's a typical industrial laundry workwear being sorted. This is not part of our labeling. Interestingly enough, ISO is wanting to put on industrial workwear care symbols. A whole other set of symbols, which, I think is unnecessary.

But here's an industrial washing machine. Processes, once it's running, about 110 pounds every two minutes. Tunnel washer. Reuses the water.

But here's another possibility. It's being done in this small facility, which they have no access industrial laundering. They're taking these dirty workwear, and they are dry cleaning it with solvent. It's the last run of the day. No additives added to it. Removes the oil, the grease, and most of the particulates, and focuses it and concentrates it in that waste drum.

So it's handled and goes to hazardous waste. Next morning, they take that load that had been dry cleaned-- oh, I forgot to tell you all, the solvent goes directly to distillation, so the-- two minutes?-- is purified and reused. The next morning, they take these garments and wash them. Again, using regular detergent.

The water soluble soils, the perspiration and so on removed that way. So it's called dual-place cleaning. Used to be popular. The only issue with dual-place cleaning, is if you did the solvent cleaning first, which is the right way to do it, you need to be sure that you have removed the residual solvent before you go to the wet cleaning site. Or else you run the risk of putting that in the water again.

So this is our topic for discussion. The circled w. The idea behind the ISO thought process, and also STM, and everyone, was the circle would be the symbol to the consumer. Professional care required. Take it to the professional. And then, we, on some level, leave it to the professional with their training to make the decision of, I need to use water on this, I need to use solvent on this. Partly based upon the label, and partly based upon what they see in terms of the fabric structure and the soils on the garment. Am I forgiven? OK.

SPEAKER 1: Thank you, Charles. That was also very informative. And now we're ready for our first discussion group to assemble up here. If you all could make your way to the tables, please.