

No. 10-0775

IN THE SUPREME COURT OF TEXAS

SUSAN ELAINE BOSTIC, INDIVIDUALLY AND AS PERSONAL REPRESENTATIVE OF THE
HEIRS AND ESTATE OF TIMOTHY SHAWN BOSTIC, DECEASED, HELEN DONNAHOE,
AND KYLE ANTHONY BOSTIC, *PETITIONERS*,

v.

GEORGIA-PACIFIC CORPORATION, *RESPONDENT*.

From the Fifth Court of Appeals, Dallas, Texas

BRIEF OF *AMICUS CURIAE*
PRODUCT LIABILITY ADVISORY COUNCIL, INC.
IN SUPPORT OF
RESPONDENT GEORGIA-PACIFIC CORPORATION

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STATEMENT OF INTEREST

The Product Liability Advisory Council, Inc. (“PLAC”) is a non-profit association with 106 corporate members from a broad cross-section of American and international product manufacturers. PLAC’s corporate members are listed at Tab “A”. In addition, several hundred leading product liability defense attorneys are sustaining (non-voting) members of PLAC.

PLAC seeks to contribute to the improvement and reform of the law affecting product liability in the United States and elsewhere. PLAC’s point of view reflects the experience of corporate members in diverse manufacturing industries. Since 1983, PLAC has filed over 1000 briefs as *amicus curiae* in state and federal courts, including this Court, presenting the broad perspective of product manufacturers seeking fairness and balance in the application and development of product liability law.

How courts enforce standards of causation in product liability cases is of utmost interest to PLAC’s members. To meet generally accepted scientific and medical methodologies, expert causation opinions in toxic substance cases must account for: (1) dose and duration of a plaintiff’s exposure; (2) the exposures required to cause the condition at issue in humans generally; and (3) a meaningful comparison of a plaintiff’s exposure to that minimally required exposure, considering potential alternative causes. These criteria are well within the legal and scientific mainstream.

This *amicus curiae* brief is respectfully submitted to the Court to address the public importance of this issue apart from and beyond the immediate interests of the parties to this case.

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**BRIEF OF *AMICUS CURIAE* PRODUCT LIABILITY ADVISORY
COUNCIL, INC. IN SUPPORT OF RESPONDENT
GEORGIA-PACIFIC CORPORATION**

STATEMENT OF THE CASE

PLAC accepts the Statement of the Case of Respondent Georgia-Pacific Corporation (“Georgia-Pacific”).

ISSUES PRESENTED

Whether the court of appeals correctly concluded that Plaintiffs produced no evidence that Georgia-Pacific’s asbestos-containing joint compound was a producing or proximate cause of Timothy Bostic’s mesothelioma when Plaintiffs’ experts relied upon the “each and every exposure” theory of causation that was rejected by this Court in *Borg-Warner v. Flores*, 232 S.W.3d 765 (Tex. 2007), and Plaintiffs presented: (1) no evidence of the “frequency, regularity, and proximity” of Mr. Bostic’s exposure to asbestos from Georgia-Pacific’s joint compound; (2) no quantitative evidence of the approximate dose of Mr. Bostic’s exposure to asbestos from Georgia-Pacific’s joint compound; and (3) no evidence that his exposure was sufficient to cause his mesothelioma.

STATEMENT OF FACTS

PLAC accepts the statement of facts of Respondent Georgia-Pacific.

Most critically to PLAC’s arguments, in the 2006 trial Plaintiffs prosecuted this case and presented evidence and expert testimony based on the “any-exposure” causation theory that this Court rejected in *Flores*. See 232 S.W.3d at 773. Plaintiffs did not attempt to meet the substantial-factor causation standard which

had been used in other cases and which this Court adopted in *Flores*. That standard requires a showing of the frequency, regularity, and proximity of exposure, as well as some quantifiable evidence of dosage above a threshold level scientifically established as causing the disease in humans. *Id.* at 772-74.

Plaintiffs' causation expert, Dr. Samuel Hammar, testified that his opinions concerning causation were based upon an "any-exposure" theory of causation, opining that "each and every exposure" to friable (breathable) asbestos, above background levels, "had the potential to contribute to" Mr. Bostic's mesothelioma.

11 RR 38-39, 48-51. Plaintiffs' counsel specifically elicited this testimony:

Plaintiffs' counsel: And is it fair to say then that to a reasonable degree of medical possibility, that if somebody has mesothelioma that each and every exposure to asbestos that that person had would be a significant contributing factor to the development of mesothelioma?

Dr. Hammar: I believe so, at least potentially a contributing factor, yes.

.....

Plaintiffs' Counsel: And did each and every exposure that Timothy Bostic had to Georgia-Pacific joint compounds and wallboard materials increase his risk of mesothelioma?

Dr. Hammar: Yes.

.....

Plaintiffs' Counsel: And is that consistent with your opinion that each and every exposure to asbestos is a contributing factor?

Dr. Hammar: Yes.

11 RR 40-41, 50-51.

Plaintiffs did not provide any quantitative evidence of the approximate dose of asbestos from Georgia-Pacific products to which Mr. Bostic was exposed. Instead, Plaintiffs presented vague testimony from Mr. Bostic's father that he used Georgia-Pacific joint compound "many, many times" in the time period when Mr. Bostic worked with him, and that he used it 98 percent of the time. 12 RR 39, 137. But he could only recall *three jobs* during that time period when he and his son did drywall work together – and, of those jobs, he only recalled using Georgia-Pacific joint compound on *one*, a job where Mr. Bostic did sewer work, not drywall work. 12 RR 24, 33-34, 78-93, 109-37.

Plaintiffs' experts' testimony on dosage was equally lacking. Plaintiffs' expert, Dr. William Longo, presented work practice simulation studies intended to establish what quantity of fibers were released by working with joint compound in controlled conditions. But Dr. Longo testified that he did not and could not establish Mr. Bostic's exposure, or any quantitative dosage level for Mr. Bostic, because different working conditions, activities, and locations would result in different exposure levels. 10 RR 73-74, 106-07.

Nor did Plaintiffs present epidemiological studies or other scientific evidence of a threshold exposure level to Georgia-Pacific joint compound, above which it would be scientifically reasonable to conclude that it is a probable cause of mesothelioma in humans. Instead, Plaintiffs' epidemiologist, Dr. Richard Lemen, testified that "each exposure . . . can increase the risk of developing asbestos-related disease." 6 RR 75. Plaintiffs' other expert, Dr. Arnold Brody, testified that "everything the person's exposed to is contributing and making it

more likely that the person gets the disease.” 4 RR 94-95. Their testimony thus was the same as Dr. Hammar’s testimony that “each and every” exposure was a “contributing” factor in causing or increasing the risk of mesothelioma.

The court of appeals looked carefully at all of the evidence and determined that Plaintiffs’ evidence was inadequate to show that exposure to Georgia-Pacific joint compound caused Mr. Bostic’s illness under the applicable substantial-factor causation standard. The court noted that Plaintiffs *did* present some “limited” evidence that Mr. Bostic was exposed to Georgia-Pacific joint compound containing asbestos. *Georgia-Pac. Corp. v. Bostic*, 320 S.W.3d 588, 595 (Tex. App.—Dallas 2010, pet. granted). Plaintiffs, however, presented “insufficient evidence of [Mr. Bostic’s] frequent and regular exposure to Georgia-Pacific’s asbestos-containing joint compound during the relevant time period.” *Id.* at 599. Moreover, it found that Plaintiffs’ evidence was “insufficient to provide quantitative evidence of [Mr. Bostic’s] exposure to asbestos fibers from Georgia-Pacific’s asbestos-containing joint compound or to establish [Mr. Bostic’s] exposure was in amounts sufficient to increase his risk of developing mesothelioma.” *Id.* at 601.

SUMMARY OF ARGUMENT

Courts have long struggled with how to determine causation, and thus assign liability, in cases where more than one action allegedly caused a single injury. That question arises especially in asbestos-exposure litigation, where one plaintiff may have been exposed to asbestos-containing products manufactured by

numerous potential defendants, but where it can be difficult to prove that any one exposure caused the plaintiff's injury. Plaintiffs have pressed courts to accept expert opinions that "any exposure" to asbestos can be considered a cause of the plaintiff's injury, making any defendant liable for the injury, regardless of how minimal the exposure to the defendant's products. Defendants have urged courts to require plaintiffs and their experts to establish some causal link between the alleged exposure and the injury.

In *Flores*, this Court adopted a substantial-factor standard for proving causation in cases of asbestos exposure. 232 S.W.3d at 770. The Court rejected the suggestion that a plaintiff could meet that burden merely by showing that the defendant's product was responsible for "any of the asbestos to which the plaintiff was exposed." *Id.* at 773 (quotation marks and citation omitted). Instead, the Court examined and approved of the widely-accepted "frequency, regularity, and proximity" test from *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156 (4th Cir. 1986), and the substantial factor test from section 431 of the Restatement (Second) of Torts. This Court held that, to show that a plaintiff's asbestos-related injury was caused by a defendant's asbestos-containing product, the plaintiff must show greater than *de minimis* exposure – by introducing evidence of the frequency, regularity, and proximity of the exposure – as well as some quantitative evidence that the plaintiff's exposure was greater than a threshold level scientifically established to cause such an injury. *Id.* at 770-73.

The *Flores* substantial-factor standard is in keeping with the generally accepted scientific consensus that the amount of exposure – the dosage – is a

crucial consideration in establishing whether a particular exposure caused an injury. It is also in keeping with the standards adopted by courts around the country. It balances the difficulty of proving causation in asbestos-exposure cases against the longstanding emphasis in Texas jurisprudence on proving causation before imposing liability, and the policy considerations inherent in managing rampant asbestos litigation.

Expert opinions like those relied upon by Plaintiffs here – that *any* exposure to an alleged toxin, no matter how low the dose, how brief the period, or how long ago, is a “substantial contributing factor” to an injury – are not in keeping with the *Flores* substantial-factor standard and are not based upon generally accepted scientific methodology. Such opinions are neither objective nor scientific, and they cannot, as a matter of law, be sufficient to establish causation and liability in a case alleging harm from asbestos exposure. Moreover, such any-exposure expert opinions seek to substitute the expert’s opinion on causation for the legal causation standard adopted by this Court, and to usurp the role of the trial court by instructing the jury on the operative legal standard. Plaintiffs here essentially ask this Court to overturn – or at least radically alter – the holding of *Flores*. *See* Pls’. Br. Merits at 20 (“Since 2007, the misapplication of and confusion surrounding this Court’s holding in *Borg-Warner [v. Flores]* has resulted in an absolute bar to proving causation in an asbestos case . . .”). Plaintiffs’ attempts to weaken or undo the *Flores* standard should be rejected as counter to the scientific and legal consensus, including the careful balance struck by this Court.

Here, the court of appeals properly applied the *Flores* substantial-factor causation standard, and its decision should be affirmed.

ARGUMENT

I. In *Flores*, This Court Adopted A Substantial-Factor Standard For Proving That Exposure To A Defendant’s Product Caused A Plaintiff’s Injury In Asbestos-Exposure Cases.

A. Proof Of Causation In An Asbestos-Exposure Case Requires Showing At Least That The Exposure To The Defendant’s Product Was Sufficient To Cause The Injury.

It is black letter law that a plaintiff pursuing a tort claim – whether based on negligence or strict liability – must establish that the defendant’s conduct caused the plaintiff’s injury. *Metro Allied Ins. Agency, Inc. v. Lin* 304 S.W.3d 830, 835 (Tex. 2009); *see also Univ. of Tex. Sw. Med. Ctr. v. Nassar*, 133 S.Ct. 2517, 2525 (2013). In Texas, that means a plaintiff must prove “cause in fact,” which consists of showing that (1) the injury would not have occurred without the defendant’s conduct (“but for” causation) and (2) the defendant’s conduct was a “substantial factor” in bringing about the injury. *Ford Motor Co. v. Ledesma*, 242 S.W.3d 32, 46 (Tex. 2007); *Lin* 304 S.W.3d at 835.¹ To be considered a “substantial factor” in causing a plaintiff harm, the “effect [of the defendant’s conduct] in producing the

¹ Strict liability claims and negligence claims require proof of “producing cause” and “proximate cause” respectively. *Gen. Motors Corp. v. Saenz*, 873 S.W.2d 353, 357 (Tex. 1993). “Both producing and proximate cause . . . require[] that the defendant’s act be a ‘substantial factor in bringing about the injury and without which the harm would not have occurred.’” *Metro Allied Ins. Agency, Inc. v. Lin* 304 S.W.3d 830, 835 (Tex. 2009) (quoting *Doe v. Boys Clubs of Greater Dallas, Inc.* 907 S.W.2d 472, 481 (Tex. 1995)).

harm” must be of the sort that would “lead reasonable men to regard it as a cause, using the word in the popular sense, in which there always lurks the idea of responsibility.” *Lear Siegler, Inc. v. Perez*, 819 S.W.2d 470, 472 (Tex. 1991) (quoting RESTATEMENT (SECOND) OF TORTS § 431 cmt. a (1965)).

Sometimes an injury can be traced back to multiple actions, each of which would be sufficient by itself to cause the injury. In such cases, one of several concurrent actions can be considered a substantial factor in causing the injury, if it alone would have been sufficient to cause the injury. “If two forces are actively operating, one because of the actor’s negligence, the other not because of any misconduct on his part, and *each of itself is sufficient to bring about harm to another*, the actor’s negligence may be found to be a substantial factor in bringing it about.” RESTATEMENT (SECOND) § 432 (1965) (emphasis added). In such a case – where multiple actions are each sufficient to cause an injury and, therefore, none is technically the but-for cause – it is a question of policy whether to consider a particular defendant’s conduct a substantial factor and thus to assign liability. Even so, before liability is assigned, a plaintiff must show, at a minimum, that the defendant’s conduct alone was sufficient to bring about the injury. *Id.*²

² Plaintiffs refer to the discussion of multiple sufficient causes in the Restatement (Third) of Torts, but that discussion does not support their position. See Pls.’ Br. Merits at 25-26 n.24, 31 n.27. The Restatement (Third) divides the discussion of legal causation into “factual causation” and “proximate causation.” RESTATEMENT (THIRD) OF TORTS: PHYS. & EMOT. HARM 5 Scope Note (2010). Section 27, which Plaintiffs cite, merely provides that when there are multiple sufficient causes for an injury, each one can be considered a *factual* cause. It does not obviate the plaintiff’s need to establish that a defendant’s action is sufficient to cause the injury. And it does not address the further policy question of whether any particular factual cause is considered a *proximate* cause.

The problem of multiple potential causes arises frequently in cases alleging harm from asbestos exposure. Plaintiffs often, as here, allege exposure to asbestos fibers from multiple products made by many manufacturers. In such cases, it is scientifically impossible to prove which asbestos fiber caused a particular plaintiff's mesothelioma or other asbestos-related disease, particularly given the long latency-period for asbestos-related diseases. *Flores*, 232 S.W.3d at 772-73. Therefore, in *Flores*, this Court established a standard of proof for plaintiffs alleging that a particular defendant's asbestos-containing product caused their injuries. That standard struck a balance between the difficulty of proving causation in asbestos exposure cases, on one hand, and the "emphasis [this Court's] jurisprudence has placed on causation as an essential predicate to liability," on the other. *Id.* at 770. As explained below, the *Flores* substantial-factor standard strikes the proper balance because it is grounded in established scientific and legal principles.

B. The *Flores* Substantial-Factor Standard Requires Plaintiffs In Asbestos-Exposure Cases To Show Frequency, Regularity And Proximity Of Exposure And Approximate Quantitative Evidence Of Dosage Above A Scientifically-Established Threshold Level.

In *Flores*, this Court considered how the general framework for determining causation in tort cases applies to cases alleging injuries caused by asbestos exposure. The Court concluded that courts hearing asbestos cases "must determine whether the asbestos in the defendant's product was a substantial factor in bringing about the plaintiff's injuries." *Flores* 232 S.W.3d at 770. As in any tort, the

burden is on the plaintiff to make the showing, so the plaintiff must prove that exposure to the defendant's asbestos-containing product was a substantial factor in causing the plaintiff's injury. *Id.* *Flores* examined this Court's prior causation precedent, cases from other jurisdictions, and the Restatement's general principles to determine how plaintiffs can meet that burden.

Asbestos exposure does not always result in injury. *See* House Comm. On Civil Practices, Bill Analysis, S.B. 15, 79th Leg. R.S. (2005) (analyzing bill enacting Texas Civil Practices and Remedies Code Chapter 90, "Claims Involving Asbestos and Silica," which passed the Senate unanimously, and stating proponents' view that "[e]xposure to asbestos or silica does not necessarily mean that a person will become ill.");³ *Flores*, 232 S.W.3d at 773. Therefore, in *Flores*, this Court explicitly rejected the theory that a plaintiff could establish that a defendant's asbestos-containing product was a substantial factor in causing the plaintiff's injury simply by showing "any" exposure to the product. 232 S.W.3d at 773 ("[T]he court of appeals erred in holding that '[i]n the context of asbestos-related claims, if there is sufficient evidence that the defendant supplied *any* of the asbestos to which the plaintiff was exposed, then the plaintiff has met the burden of proof'" (quoting *Borg-Warner Corp. v. Flores*, 153 S.W.3d 209, 213 (Tex. App.—Corpus Christi 2004, pet. granted)) (emphasis added by this Court).

³ In 2005, in response to the "asbestos litigation crisis" overtaking the Texas courts, the Texas Legislature adopted Civil Practices and Remedies Code Chapter 90, "Claims Involving Asbestos and Silica," which established medical criteria governing claims for injuries resulting from asbestos or silica. Act of May 16, 2005, 79th Leg., R.S., ch. 97, § 1, 2005 Tex. Gen. Laws 169. The trial here, as in *Flores*, took place before Chapter 90 was passed and was not governed by its provisions.

Instead, this Court examined the “most widely cited standard for proving causation in asbestos cases,” the “*Lohrmann* ‘frequency, regularity, and proximity’ test.” *Id.* at 769 (quoting *Lohrmann v. Pittsburgh Corning Corp.*, 782 F.2d 1156 (4th Cir. 1986)). In *Lohrmann*, the Fourth Circuit considered a case where the plaintiff showed only that the defendant’s asbestos-containing product had been present at the worksite where the plaintiff worked. *Lohrmann*, 782 F.2d at 1162. The Fourth Circuit rejected the plaintiff’s proposed rule:

[I]f the plaintiff can present any evidence that a company’s asbestos-containing product was at the workplace while the plaintiff was at the workplace, a jury question has been established as to whether that product contributed as a proximate cause to the plaintiff’s disease.

Id. Because that rule would be “contrary to the Maryland law of substantial causation,” the *Lohrmann* court held instead that a plaintiff must satisfy a “frequency, regularity and proximity test”:

To support a reasonable inference of substantial causation from circumstantial evidence, there must be evidence of exposure to a specific product on a regular basis over some extended period of time in proximity to where the plaintiff actually worked.

Id. at 1162-63. As the *Lohrmann* court explained, this “*de minimis* rule” was necessary because a plaintiff must “prove more than a casual or minimum contact with the product” and because, as the expert testimony showed, exposure below a certain level was “insignificant as a causal factor in producing the plaintiff’s disease.” *Id.*

When this Court examined the *Lohrmann* frequency, regularity and proximity test in *Flores*, it held that the test “is appropriate” but also explained that

“those terms do not, in themselves, capture the emphasis our jurisprudence has placed on causation as an essential predicate to liability.” 232 S.W.3d at 770. Thus, the Court held that merely showing some evidence that a plaintiff was exposed with some frequency, regularity and proximity is *not* sufficient to show whether exposure to a defendant’s asbestos-containing product “sufficiently contributed to the aggregate dose of asbestos [a plaintiff] inhaled, such that it could be considered a substantial factor in causing his asbestosis.” *Id.* at 772. As this Court explained, despite the name of the “frequency-regularity-proximity test,” simply showing those three factors was not the whole of the test, even as applied in *Lohrmann*. *Id.*; *see Lohrmann* 782 F.2d at 1163. Logically, the test “must” also include “a requirement that asbestos fibers were released in an amount sufficient to cause” the plaintiff’s injury. *Flores*, 232 S.W.3d at 772. “[P]roof of mere frequency, regularity, and proximity is necessary but not sufficient, as it provides none of the quantitative information necessary to support causation under Texas law.” *Id.*

To determine how a plaintiff could provide the necessary quantitative information, the Court turned its attention to the question of dosage. As discussed below, this Court drew on the insights of other courts and the scientific disciplines of toxicology and epidemiology. In short, this Court noted that one of toxicology’s central tenets is that “the dose makes the poison,” that “all substances are poisonous – there is none which is not; the dose differentiates a poison from a remedy,” and that dose has been considered “the single most important factor in evaluating whether an alleged exposure caused a specific adverse effect.” *Id.* at

770 (quotation marks, alterations, and citations omitted). Therefore, in *Flores*, this Court held that plaintiffs must not only present evidence establishing that the individual was exposed to asbestos fibers from the defendant's product with some frequency, regularity and proximity. Plaintiffs must also show that the individual was exposed to a dosage high enough for the defendant's product to be the actual and substantial cause of the injury.

Therefore, this Court required a plaintiff to show (1) the "approximate quantum of [the defendant's] fibers to which [the plaintiff] was exposed" and (2) that this quantum of exposure "sufficiently contributed to the aggregate dose of asbestos [the plaintiff] inhaled, such that it could be considered a substantial factor in causing his [injury]." 232 S.W.3d at 772. The former showing requires "[d]efendant-specific evidence relating to the approximate dose to which the plaintiff was exposed." *Id.* at 773. The latter requires a showing that the plaintiff's "exposure or dose levels were comparable to or greater than those in" scientific studies demonstrating an "exposure 'threshold'" above which it is reasonable to infer causation.⁴ *Id.* at 771-73 (quoting *Temple-Inland Forest Prods. Corp. v. Carter*, 993 S.W.2d 88, 95 (Tex. 1999)) (citing *Merrell Dow Pharms., Inc. v. Havner*, 953 S.W.2d 706, 720-21 (Tex. 1997)).

⁴ This Court has established that epidemiological studies showing "more than a doubling of the risk" are sufficient to infer causation because that showing "strikes a balance between the needs of our legal system and the limits of science." *Merrell Dow Pharms., Inc. v. Havner*, 953 S.W.2d 706, 715 (Tex. 1997) (quoted in *Flores*, 232 S.W.3d at 772) (emphasis added). Merely increasing or contributing to the risk is insufficient to establish causation.

Thus, after *Flores*, to establish that exposure to a defendant's asbestos-containing product was a substantial factor in causing the plaintiff's injury, a plaintiff must first establish that there was a greater than *de minimis* level of exposure by showing frequency, regularity, and proximity of exposure, and then must also provide quantitative evidence of the approximate dose to which the plaintiff was exposed and scientific evidence showing that dosage was sufficient to cause the alleged injury.

As discussed further below, this common-sense requirement – that plaintiffs show the threshold level of exposure that can cause injury, and then show that they were exposed to at least that much – is in keeping with this Court's basic tort causation principles, with established scientific understandings, and with the treatment of asbestos claims in courts around the country. *See infra* Secs. II, III.

The standard adopted by this Court in *Flores* and employed by the court of appeals here is realistic and practical. It does not require plaintiffs to trace their injuries to specific asbestos fibers, as Plaintiffs contend. Pls'. Br. Merits at 24; *see also* Pls'. R. Br. Merits at 5. Nor does it require them to calculate and prove a precise numerical "dose of asbestos inhaled," as Plaintiffs also argue. Pls'. Br. Merits at 44-45. But, it does require a plaintiff to present *some* evidence of the approximate dosage to which a plaintiff was exposed, and *some* scientific evidence showing that dosage is equal to or higher than a dosage that has been shown to cause the type of injury. Plaintiffs made no effort to meet this standard, as the

court of appeals recognized.⁵ The court of appeals' decision should therefore be affirmed.

II. The *Flores* Substantial-Factor Standard Is Supported By Established Scientific Consensus.

It is well established that “scientific knowledge of the harmful level of exposure to a chemical, and knowledge that the plaintiff was exposed to such quantities are *minimal* facts *necessary* to sustain the plaintiffs’ burden.” *Burleson v. Tex. Dep’t of Criminal Justice*, 393 F.3d 577, 586 (5th Cir. 2004) (emphasis added) (citation and quotation marks omitted). “[S]cientific knowledge’ implies the opinion is based on more than unsupported speculation.” *Ranes v. Adams Labs., Inc.*, 778 N.W.2d 677, 697 (Iowa 2010) (citation omitted). In toxic-exposure cases, expert testimony on causation is rooted in principles established through toxicology and epidemiology. The substantial-factor causation standard articulated in *Flores* reflects the consensus understanding of scientists in those fields: dosage matters. By contrast, expert opinions claiming instead that *any*

⁵ Plaintiffs’ experts did not present or rely on scientific studies establishing a threshold dosage above which it is reasonable to infer causation. Instead, they referred to the exposure levels in OSHA safety standards. OSHA safety standards cannot show causation because governmental agency regulations serve a different purpose – balancing available data about risks and benefits – and prophylactically apply a lower standard for assessing risk than is necessary to establish causation in a tort action seeking an award of damages. Administrative agencies “may make regulatory decisions . . . based on postmarketing evidence that gives rise to only a suspicion of causation.” *Matrixx Initiatives, Inc. v. Siracuso*, 131 S. Ct. 1309, 1320 (2011) (citation omitted). Texas law is clear that “common law duties imposed by state law are not expanded by [federal] regulations.” See, e.g., *McClure v. Denham*, 162 S.W.3d 346-353 (Tex. App.—Fort Worth 2005, no pet.).

exposure to asbestos is a substantial factor causing an injury are mere speculation and contradict that consensus.

A. The *Flores* Substantial-Factor Standard Is In Keeping With The Science Of Toxicology.

The *Flores* decision is based on a strong scientific foundation. As this Court recognized, a “central tenet” of toxicology is that “the dose makes the poison.” *Flores*, 232 S.W.3d at 770 (citing Bernard D. Goldstein & Mary Sue Henifin, “Reference Guide on Toxicology,” *Reference Manual on Scientific Evidence*, at 636 (Fed. Jud. Ctr. 3d ed. 2011) (“*Toxicology Guide*”)).⁶ This principle recognizes that all chemical substances, “[e]ven water,” can cause harm, but only when a person is exposed to a sufficient dose of the substance. *Id.*⁷ Since “depending upon dose, all chemical and physical agents are harmful,” *Toxicology Guide* at 660, establishing causation means that the dose must be, if not known precisely, at least estimated reasonably. Thus, the foundation of toxicology is the dose-response relationship, which “describes the relationship between the magnitude or severity of the effects [of a substance] and the dose.” David L. Eaton, *Scientific Judgment & Toxic Torts – A Primer in Toxicology for Judges & Lawyers*, 12 J.L. & Pol’y 5, 15 (2003).

⁶ Following the decision in *Daubert v. Merrell Dow Pharms.*, 509 U.S. 579 (1993), the Federal Judicial Center produced a series of authoritative references for judges faced with determining the reliability of various types of expert testimony, the most recent being the 2011 third edition of the *Reference Manual on Scientific Evidence*.

⁷ Some substances, while helpful or even necessary to sustain life, are harmful in large doses. Oxygen is toxic when breathed in 100% concentrations over several days, and aspirin, while alleviating headaches with two tablets, can be fatal if an entire bottle is ingested. Ronald E. Gots, *Toxic Risks: Science, Regulation, & Perception*, at 42 (CRC Press 1993).

“Evidence of exposure is essential in determining the effects of harmful substances.” *Id.* at 666. “Ultimately the dose incurred by populations or individuals is the measure needed by health experts to quantify risk of toxicity.” Joseph V. Rodricks, “Reference Guide on Exposure Science,” *Reference Manual on Scientific Evidence*, at 507 (Fed. Judicial Center 3d ed. 2011) (“*Exposure Science Guide*”). Establishing the degree of exposure to a substance is “[c]ritical to the determination of causation.” *Id.* “Dose is a central concept in the field of toxicology, and an expert toxicologist will consider the extent of a plaintiff’s dose in making an opinion.” *Toxicology Guide* at 638.⁸ As this Court put it in *Flores*, “Dose ‘refers to the amount of chemical that enters the body,’ and, according to one commentator, is ‘the single most important factor to consider in evaluating whether an alleged exposure caused a specific adverse effect.’” *Flores*, 232 S.W.3d at 770 (quoting Eaton, *Scientific Judgment*, 12 J.L. & Pol’y, at 11).

⁸ Like toxicology, epidemiology also recognizes that set criteria must be met before experts may make valid causation determinations. Epidemiology concerns “disease causation and [how] to prevent disease in groups of individuals.” Michael D. Green, D. Michal Freedman & Leon Gordis, “Reference Guide on Epidemiology,” *Reference Manual on Scientific Evidence*, at 551 (Fed. Jud. Ctr. 3d ed. 2011) (“*Epidemiology Guide*”). When diagnosing causes of disease, physicians/scientists first look to epidemiology to determine if there is, at least, a statistically significant association between a substance and a disease. If one exists, epidemiologists then use other criteria to evaluate whether the epidemiologic association is causal. Those criteria are: (1) consistency; (2) strength of association; (3) dose response; (4) biological plausibility; (5) coherence; (6) temporality; (7) specificity; (8) analogy; and (9) experimentation. Douglas L. Weed, *Causation: An Epidemiologic Perspective (In Five Parts)*, 12 J.L. & Pol’y 43, 43 (2003-04), citing Austin Bradford Hill, *The Environment & Disease: Association or Causation?*, 58 Royal Soc’y Med. 295, 295-300 (1965). The *Epidemiology Guide* lists these as factors to be used in determining causation. See *Epidemiology Guide*, at 600.

Accordingly, determining the dose-response relationship is “essential in evaluating a causal connection between an alleged exposure and a particular disease.” Eaton, *Scientific Judgment*, 12 J.L. & Pol’y, at 18. As the *Flores* opinion recognizes, any reliable expert opinion on causation must be premised on three criteria, each of which depends on a dose-response relationship:

First, the expert should analyze whether the disease can be related to chemical exposure by a biologically plausible theory. Second, the expert should examine if the plaintiff was exposed to the chemical in a manner that can lead to absorption into the body. Third, the expert should offer an opinion as to whether the dose to which the plaintiff was exposed is sufficient to cause the disease.

Toxicology Guide, at 661 (quoted in *Flores*, 232 S.W.3d at 771). The dose-response relationship of a given substance is “relatively consistent” and “predictable from person to person.” Gots, *Toxic Risks*, at 44 (observing “[i]f this were not so, there would be no safe medications; two tablets might help one patient, but kill another”); see *Toxicology Guide*, at 665 (causation “is based on an assessment of the individual’s exposure, including the amount, the temporal relationship between the exposure and disease, and other disease-causing factors. This information is then compared with scientific data on the relationship between exposure and disease.”). As one scientist observed about chemical carcinogens, “To deny the existence of dose response [is] clearly an insupportable concept.” Paul Kotin, *Dose-Response Relationship & Threshold Concepts*, 271 *Annals N.Y. Acad. Sci.* 22, 24 (1976).

One crucial step in determining dose-response is for toxicologists to determine the “no observable effect level,” the “threshold . . . below which no toxicity is observed.” *Toxicology Guide*, at 641; Eaton, *Scientific Judgment*, 12 J.L. & Pol’y, at 16, Gots, *Toxic Risks*, at 47. Below this level “a relationship between the exposure and disease **cannot be established.**” *Toxicology Guide*, at 669 (emphasis added). “When an exposure to a chemical is less than that known to produce a toxic response, **scientific data cannot, as a rule, support a claim of a causal connection.**” Gots, *Toxic Risks*, at 163 (emphasis added). “It is not adequate to simply establish that ‘some’ exposure occurred. Because most chemically induced adverse health effects clearly demonstrate ‘thresholds,’ there must be reasonable evidence that the exposure was of sufficient magnitude to exceed the threshold before a likelihood of ‘causation’ can be inferred.” Eaton, *Scientific Judgment*, 12 J.L. & Pol’y, at 39 (quoted in *Flores*, 232 S.W.3d at 773); *Epidemiology Guide* at 613 (“[A] risk estimate from a study that involved a greater exposure is not applicable to an individual exposed to a lower dose.”) That is why, under the *Flores* substantial-factor standard, “some exposure ‘threshold’ must be demonstrated before a claimant can prove his asbestosis was caused by a particular product.” 232 S.W.3d at 773.⁹

⁹ Some experts, and even some courts, use the term “threshold” to mean an exposure dose **below** which it has been scientifically established that a substance does **not** cause harm, and hence in the asbestos context it is sometimes said that there is “no known safe threshold” for asbestos exposure. This concept, however, is utterly irrelevant in tort litigation, in which plaintiffs bear the burden of proving that the substance at issue – here asbestos – **does** indeed cause harm in humans generally, and also that it did so in the particular plaintiff. It is in connection with this burden that Plaintiffs must necessarily show, among other things, what this Court required in *Flores*: a reasonable estimate of the asbestos dose to which plaintiff was exposed from working

B. “Any-Exposure” Expert Opinions Contradict The Science Of Toxicology.

In contrast, expert opinions that “any” or “each and every” exposure is a substantial factor in causing an injury ignore the basic tenet of toxicology that, to determine the cause of a particular condition reliably, one must determine the dose-response relationship between the substance and condition at issue. *Toxicology Guide*, at 646-47. For that reason, this Court rejected reliance on such opinions in *Flores*. 232 S.W.3d at 773. Any-exposure opinions ignore that nothing is free of toxins, and that infrequent or irregular exposure to low levels of toxins often are unlikely to cause injury. Every time a chemical is washed down a sink, that chemical is released into the water, and each time a car is driven or a shirt is dry-cleaned, chemicals are released into the air. Air and water will never be toxin-free. Gots, *Toxic Risks*, at 108. Carcinogens are found in everyday items such as “wine, beer, lettuce, root beer, apples, mushrooms, pears, plums, peanut butter, tea, celery, carrots, bread, and chlorinated water.” Richard J. Pierce, Jr., *Causation in Government Regulation & Toxic Torts*, 76 Wash. U.L.Q. 1307, 1315-16 (1998).¹⁰ Thus, the relevant question is not “Is any [toxin] present?”, but “Is any meaningful amount [of toxin] present?” Gots, *Toxic Risks*, at 108-09.

with or around the defendant’s product, and that this exceeds the threshold level that has been shown by reliable scientific evidence to cause the disease at issue in humans.

¹⁰ Specifically, “[b]oth orange juice and coffee each contain known animal carcinogens. Orange juice contains d-limonene, while coffee contains nineteen known animal carcinogens, the most powerful of which is caffeic acid.” Pierce, *Causation in Government Regulation & Toxic Torts*, 76 Wash. U.L.Q. at 1313. The specific carcinogens in orange juice and coffee are more potent, by more than an order of magnitude, than the pesticide Alar and are “more carcinogenic by six to eight orders of magnitude than three of the synthetic substances that the National Research Council (‘NRC’) has identified as posing relatively high potential risks to humans.” *Id.*

That is the question addressed by the *Flores* substantial-factor standard. By rejecting plaintiffs’ attempts to prove causation merely by showing “some” or “any” exposure to asbestos, the *Flores* Court reflected the scientific consensus that dosage matters. The substantial-factor causation standard articulated in *Flores* embodies this well-established scientific understanding of dose-response. It does so by requiring a plaintiff to show (1) the frequency, regularity, and proximity of exposure above a *de minimis* level, (2) an approximation of the level of exposure – the dose – experienced by the plaintiff, and (3) scientific evidence that the dose experienced by the plaintiff meets or exceeds the threshold dosage shown to cause the injury. Expert opinions that any exposure can cause an injury contradict that scientific understanding, and fail to meet that standard. The *Flores* requirements are in keeping with the science underlying toxic exposure cases, and abandoning them would unmoor the principles of legal causation from their scientific foundations.¹¹

III. The *Flores* Substantial-Factor Standard Is Legally Correct And Practicable.

Because any-exposure opinions lack any scientific basis, courts around the country have adopted substantial-factor standards like those in *Lohrmann* and

¹¹ Plaintiffs’ argument that under *Flores* a plaintiff need only show “that the exposure to the defendant’s product ‘contributes’ to the individual’s aggregate dose of asbestos” mischaracterizes this Court’s holding. Pls’. Br. Merits at 32-33 (quoting *Flores*, 232 S.W.3d at 772). In *Flores*, this Court never doubted that the defendant’s products could have *contributed* to Flores’ injury; it faulted the plaintiff for not showing that exposure “*sufficiently* contributed” to his aggregate dose of asbestos, *i.e.*, met the *substantial* contributing factor standard. 232 S.W.3d at 772. By omitting the sufficiency requirement, Plaintiffs seek to weaken the standard.

Flores, and have rejected expert opinions based on an any-exposure theory of causation in asbestos-exposure and toxic-exposure cases. Those courts generally agree that “[1] scientific knowledge of the harmful level of exposure to a chemical, and [2] knowledge that the plaintiff was exposed to such quantities are *minimal* facts *necessary* to sustain the plaintiffs’ burden.” *Burleson*, 393 F.3d at 586 (emphasis added) (citation and quotation marks omitted). As cases from jurisdictions around the country and Texas cases since *Flores* demonstrate, the substantial-factor standards, including *Flores*, have proved workable and fair. By contrast, any-exposure opinions essentially substitute the expert’s dicta on causation for the legal standard, threatening to usurp the trial court’s authority to instruct the jury on the law.

A. In Asbestos-Exposure Cases Around The Country, Courts Have Adopted Standards Like The *Flores* Substantial-Factor Standard And Have Rejected “Any-Exposure” Expert Opinions.

Both before *Flores* and since, numerous courts have adopted substantial-factor standards like the ones in *Flores* and *Lohrmann*. For example, in *Betz v. Pneumo Abex, LLC*, 44 A.3d 27 (Pa. 2012), the Pennsylvania Supreme Court found an expert opinion purporting to establish causation in asbestos-exposure cases based on “any exposure” inherently unscientific, because:

- The expert “rendered his opinion without being prepared to discuss the circumstances of any individual’s exposure.” *Id.* at 55.
- “[E]fforts to invoke case reports, animal studies, and regulatory standards are also ineffectual in terms of substantial-factor causation, since the most these can do is suggest that there is underlying risk from the defendants’ products.” *Id.*

- An “any-exposure opinion is in irreconcilable conflict with itself. Simply put, one cannot simultaneously maintain that a single fiber among millions is substantially causative, while also conceding that a disease is dose responsive.” *Id.* at 56.
- “The comments to the Second Restatement of Torts recognize that a proportionate evaluation may be required in a reasoned assessment of substantial-factor causation.” *Id.* at 56 n.36.
- The expert “discount[ed]” epidemiologic studies and “was not really prepared to discuss epidemiology.” *Id.* at 57.
- The expert’s extrapolations sought “to evade a reasoned Frye inquiry merely by making references to accepted methods in the abstract.” *Id.* at 58.

In other words, the expert’s any-exposure opinion in *Betz* failed to provide the kinds of scientifically-reliable and plaintiff- and defendant-specific evidence that this Court required in *Flores*.

The Pennsylvania Supreme Court also explained in *Gregg v. V-J Auto Parts Co.*, 943 A.2d 216 (Pa. 2007), that an expert opinion requires more than the expert’s *ipse dixit* to establish that an exposure is a “substantial contributing factor” in causing an injury (as Plaintiffs’ expert testified here):

Just because a hired expert makes a legal conclusion does not mean that a trial judge has to adopt it if it is not supported by the record and is devoid of common sense. For example, [plaintiffs’ expert] used the phrase, “Each and every exposure to asbestos has been a substantial contributing factor to the abnormalities noted.” ***However, suppose an expert said that if one took a bucket of water and dumped it in the ocean, that was a “substantial contributing factor” to the size of the ocean. [Plaintiffs’ expert’s] statement saying every breath is a “substantial contributing factor” is not accurate.*** If someone walks past a mechanic changing brakes, he or she is exposed to asbestos . . . [but] it can hardly be said that the one whiff of the asbestos from the brakes is a “substantial” factor in causing disease.

Id. at 223 (citation and quotation marks omitted) (emphasis added). Once again, an expert opinion on causation that was not based on the specific plaintiff’s individual exposure from the specific defendant’s products and a scientifically-established understanding of threshold dosage was not sufficient to show causation.

Similarly, the unanimous Nevada Supreme Court agreed that both sufficient proof of “frequency, regularity, and proximity” and evidence of actual “*significant* exposure” to a defendant’s asbestos-containing products is necessary to establish “substantial factor” causation. *Holcomb v. Georgia Pacific LLC*, 289 P.3d 188, 197 (Nev. 2012) (emphasis in original). Expert testimony based on *de minimis* exposure (i.e. “any exposure”) was not enough:

[W]e first address the standard for finding that a respondent’s product caused [decedent’s] mesothelioma. . . . [T]he courts that adopt the three-factor test of frequency, regularity, and proximity regularly reject the “any” exposure argument. Thus, more than any exposure must be shown . . . [and] *de minimis* exposures are insufficient to prove that the exposure was a substantial factor in causing mesothelioma.

Id. (citations omitted). Vague, unquantified references to possible exposure were insufficient, the court held, to create a causal connection between a plaintiff’s mesothelioma and a defendant’s products, and were insufficient to survive summary judgment. *Id.* at 200.¹²

¹² While the *Holcomb* commented that this Court’s *Flores* substantial-factor standard could be too stringent if it were read to require a plaintiff to “demonstrate not only the dosage quantity of exposure to a particular defendant’s product but also the total asbestos dosage to which he was exposed,” that court did not disapprove of this Court’s basic insight and holding in *Flores*, and

The Virginia Supreme Court recently adopted a similar standard, requiring plaintiffs to prove that the plaintiff’s exposure to asbestos from the defendant’s product was “more likely than not *sufficient* to have triggered the harm.” *Ford Motor Co. v. Boomer*, 736 S.E.2d 724, 731 (Va. 2013). That case considered the *Lohrmann* and *Flores* standards, and rejected as confusing and insufficient to establish liability a standard that merely required an opinion that the exposure was a “substantial contributing factor,” as Plaintiffs’ experts testified here. *Id.* The *Boomer* court explained that a “substantial contributing factor” standard alone was confusing, and noted this Court’s addition of “defendant-specific evidence relating to *dose*” as one way to cabin that confusion. *Id.* at 730. The court was concerned that a standard that turned on whether an exposure “contributed” to the injury would invite juries to find causation simply when exposure *increased the risk* of the harm, regardless of whether it was sufficient to *cause* the harm. *Id.* at 729-31. Therefore, the *Boomer* court rejected the substantial contributing factor standard – just as this Court rejected the any-exposure standard – and required plaintiffs to show that the exposure was “more likely than not *sufficient* to have triggered the harm” – just as this Court required plaintiffs to show evidence of dosage above a scientific threshold making it reasonable to infer causation.¹³

fundamentally agreed that “any-exposure” opinions cannot establish causation and that plaintiffs must demonstrate exposure to a defendant’s product in a dosage sufficient to cause the particular injury. *Holcomb*, 289 P.3d at 195-97.

¹³ In *Dixon v. Ford Motor Co.*, ___ A.3d ___, 2013 WL 3821431 (Md. July 25, 2013), the Maryland Court of Appeals declined to bar an expert for uttering an “isolate[ed]” any-exposure opinion where other evidence established “repeated exposure” (approximately 1,000 times) to “high-level doses of asbestos” from the defendant’s products. *Id.* at *7-8. Where, as here, other

In short, “experts’ opinions are worthless without data and reasons.” *United States v. Mamah*, 332 F.3d 475, 477-78 (7th Cir. 2003). As one court put it recently, it is “questionable” whether the any-exposure proposition “can even properly be called a theory” because it is not “a coherent collection of general propositions used to describe a conclusion.” *Smith v. Ford Motor Co.*, 2013 WL 214378, at *2 (D. Utah Jan. 18, 2013). As that court explained, the any-exposure opinion there – also by Plaintiffs’ expert, Dr. Hammar – “asks too much from too little evidence”:

Dr. Hammar wants to be allowed to tell a jury that all of the plaintiff’s possible exposures to asbestos during his entire life were contributing causes . . . without regard to dosage or how long ago the exposure occurred. Just because we cannot rule anything out does not mean we can rule everything in.

Id. at *3. For that reason, the *Smith* court joined the host of other courts, including this one, in rejecting any-exposure “expert testimony attempting to assert causation without assessing the dose.” *Id.* at *4 (collecting cases).

B. In Other Toxic-Exposure Cases Around The Country, Courts Have Adopted Similar Causation Standards And Rejected “Any-Exposure” Expert Opinions.

In cases alleging exposure to toxic substances besides asbestos, the same holds true. For example, in *Parker v. Mobil Oil Corp.*, 857 N.E.2d 1114 (N.Y.

evidence establishing dose is lacking, *Dixon* agreed that the scientific validity of an any-exposure opinion would be questionable. *Id.* (“[t]hat kind of opinion, if offered in a case of truly minimal exposure to the defendant’s product, may well raise concerns that would need to be tested under [Maryland’s *Frye*-based test]”). *Dixon* also affirmed a jury verdict of no causation involving a different product where no comparable exposure evidence existed. *Id.* at *10.

2006), New York’s highest court held that the scientific consensus rejects causation opinions that fail to account for the dose-response relationship or to show that a plaintiff’s exposure was sufficient to cause the alleged injury. It is “well-established that an opinion on causation should set forth a plaintiff’s exposure to a toxin, that the toxin is capable of causing the particular illness (general causation) and that plaintiff was exposed to sufficient levels of the toxin to cause the illness (specific causation).” *Id.* at 1120 (citations omitted).

The *Parker* court, like this Court in *Flores*, recognized that it is not always possible to quantify exposure levels precisely or to establish an exact dose-response relationship. *Id.* at 1120-21. Therefore, it discussed several generally accepted forms of scientific testimony that can be used to establish dosage and causation:

- Actual dosage levels – which are, of course, preferred where they exist;
- Evidence of “intensity of exposure,” if the science suggests that intensity “may be more important than a cumulative dose for determining the risk[;]”
- Estimation of exposure “through the use of mathematical modeling by taking a plaintiff’s work history into account[;]” and
- “[Q]ualitative” comparison of the plaintiff’s exposure “to the exposure levels of subjects of other studies” where an expert makes “a specific comparison sufficient to show how the plaintiff’s exposure level related to those of the other subjects.”

Id. at 1121. The plaintiff in *Parker* used none of these methods and did not attempt to estimate his exposure to the substance at issue (benzene). The *Parker* court affirmed summary judgment, holding a “general, subjective and conclusory assertion-based” expert opinion finding causation based solely on the plaintiff’s

testimony was outside the pale of general scientific acceptance. *Id.* Such an opinion “neither states the level of [studied] exposure, nor specifies how [plaintiff’s] exposure exceeded it, thus [it] lack[s] epidemiologic evidence to support the claim.” *Id.* at 1121-22. A second expert opinion couched in vague and unquantifiable terms – “frequent,” “extensive,” “excessive” – also failed because: (1) “even given that an expert is not required to pinpoint exposure with complete precision [such unquantifiable terms] cannot be characterized as a scientific expression of [plaintiff’s] exposure level”; (2) exposure to the concentrated substance could not be analogized to exposure to the substance in dilute form; (3) the opinion lacked epidemiological support; and (4) “standards promulgated by regulatory agencies as protective measures are inadequate to demonstrate legal causation.” *Id.* at 1122.

Similarly, this Court in *Flores* rejected evidence that the plaintiff was exposed to “‘some asbestos’ on a fairly regular basis for an extended period of time” as too vague and unquantifiable to be the basis for establishing causation. 232 S.W.3d at 771-72 (finding that “evidence show[ing] that Flores worked in a small room, grinding brake pads composed of partially embedded asbestos fibers, five to seven times per week over a four year period” did not establish exposure “in an amount sufficient to cause Flores’s asbestosis”).

Numerous other courts have rejected versions of the any-exposure causation theory in cases alleging exposure to toxic substances. In *Pluck v. BP Oil Pipeline Co.*, the Sixth Circuit held that “a plaintiff must show that she was exposed to the toxic substance and that the level of exposure was sufficient to induce the

complained-of medical condition.” 640 F.3d 671, 677 (6th Cir. 2011) (citation and quotation marks omitted). The expert’s “differential diagnosis” failed because it was impossible to “rule in” exposure to a substance as a cause of the plaintiff’s injury when her expert “did not ascertain [her] level of . . . exposure.” *Id.* at 679.

In *Burleson* – a case alleging that exposure to radiation caused the plaintiff’s cancer – the Fifth Circuit rejected the plaintiff’s argument that no evidence of dose was needed because the only important measurement was “the total dose of radiation to the one cell that was transformed into a cancer cell.” 393 F.3d 577 at 587. That dose, of course, could not be determined – just as the particular asbestos fiber which causes mesothelioma cannot be identified – but was allegedly “high.” *Id.* With the plaintiff’s exposure level undetermined, the court rejected the opinion as mere “*ipse dixit* of the expert.” *Id.* (quoting *Gen. Elec. v. Joiner*, 522 U.S. 136, 146 (1997)).

In *Guinn v. AstraZeneca Pharmaceuticals LP*, 602 F.3d 1245 (11th Cir. 2010), the plaintiff’s expert failed to quantify the dosage and opined instead that every risk factor was *ipso facto* a “substantial cause.” The court affirmed exclusion of that opinion:

An expert, however, cannot merely conclude that all risk factors for a disease are substantial contributing factors in its development. The fact that exposure to [a substance] may be a risk factor for a disease does not make it an actual cause simply because the disease developed.

Id. at 1255.

Guinn relied upon *Cano v. Everest Minerals Corp.*, 362 F. Supp.2d 814, 824 (W.D. Tex. 2005), a pre-*Flores* case applying Texas law. In *Cano*, the plaintiff proffered a “linear no-threshold model,” which amounted to an opinion that any exposure to radiation, however minute, was a substantial factor in causing cancer. That opinion was inadmissible as contrary to fundamental science.

[The expert] repeatedly testified that dose did not matter, and that any exposure above background (apparently no matter how small or remote) was a substantial contributing factor. . . . [The law] require[s] more of an expert witness than simply saying that [a minuscule dose] of radiation was a substantial contributing factor because. . .we are all exposed to radiation daily, yet most people do not get cancer. . . .

Id. at 847-48 (footnotes omitted). Where “an expert’s causation opinion [is] not based on sufficient information of the level of the agent to which Plaintiffs were exposed, his methodology [will] not be reliable, rendering his causation opinion inadmissible.” *Id.* at 848 (citation and quotation marks omitted).¹⁴

¹⁴ *Accord Baker v. Chevron U.S.A. Inc.*, __ Fed.Appx.__, 2013 WL 3968783, at *16-19 (6th Cir. Aug. 2, 2013) (affirming Rule 11 sanctions and dismissal of medical monitoring claims following grant of summary judgment on other claims because plaintiffs expert opinions failed to account for individual dosage); *Nat’l Bank of Commerce v. Associated Milk Producers, Inc.*, 191 F.3d 858, 864 (8th Cir. 1999) (that “plaintiffs’ experts have no scientific knowledge or information as to the level of [plaintiffs] exposure” supported affirmance of exclusion); *McMunn v. Babcock & Wilcox Power Generation Group, Inc.*, 2013 WL 3487560, at *28-29 (W.D. Pa. July 12, 2013) (approving and adopting reasoning from *Cano* and rejecting expert opinion lacking evidence of dosage and epidemiological support); *Zellars v. NexTech Northeast, LLC*, 895 F. Supp. 2d 734, 741 (E.D. Va. 2012) (“plaintiff in a toxic tort case bears the burden of demonstrating her actual level of exposure to the alleged toxin”); *Baker v. Chevron USA, Inc.*, 680 F. Supp.2d 865, 885 (S.D. Ohio 2010) (“the no threshold or one-hit theory is not an accepted causation theory”); *Henricksen v. ConocoPhillips Co.*, 605 F. Supp.2d 1142, 1162 (E.D. Wash. 2009) (excluding causation opinion that “did not attempt to quantify dose or even estimate [plaintiff’s] level of exposure”); *Wills v. Amerada Hess Corp.*, 2002 WL 140542, at *14 (S.D.N.Y. Jan. 31, 2002) (rejecting opinion because “the level of exposure of plaintiff to the toxin in question must be determined,” and the expert “admitted” not doing so); *Polaino v. Bayer Corp.*, 122 F. Supp.2d 63, 70 (D. Mass. 2000) (expert’s “fundamental error was his failure . . . to

All of these cases are in keeping with this Court's articulation of the substantial-factor standard, and with its rejection of any-exposure opinions. And these cases also comport with the rulings of the Texas courts of appeals applying *Flores* standard here and in other post-*Flores* cases.

C. The *Flores* Substantial-Factor Standard Is Workable And Fair.

The multiple cases adopting standards similar to the *Lohrmann* and *Flores* standards, not only demonstrate a growing jurisprudential consensus but also confirm that such standards are workable and fair. Since *Flores*, the Texas courts of appeals have consistently applied the substantial-factor standard to weed out any-exposure opinions purporting to find causation in asbestos-related cases when the plaintiffs failed to adduce evidence of dose or exposure levels above

estimate through modeling (or any other technique) the dose to which [plaintiff] could have been exposed"); *Wynacht v. Beckman Instruments, Inc.*, 113 F. Supp.2d 1205, 1210 (E.D. Tenn. 2000) ("Key to these investigations is identifying the level of exposure and how it interacts with various organs or body systems ('dose-response'), both in terms of how the chemical is initially distributed through the organism as well as how it ultimately produces a specific ill-effect."); *Sutera v. Perrier Group, Inc.*, 986 F. Supp. 655, 666 (D. Mass. 1997) ("there is no scientific evidence that the linear no-safe threshold analysis is an acceptable scientific technique used by experts in determining causation in an individual"); *Mancuso v. Consol. Edison Co.*, 967 F. Supp. 1437, 1450 (S.D.N.Y. 1997) ("it is improper for an expert to presume that the plaintiff must have somehow been exposed to a high enough dose to exceed the threshold necessary to cause the illness") (quotation marks omitted); *Cuevas v. E.I. DuPont de Nemours & Co.*, 956 F. Supp. 1306, 1312 (S.D. Miss. 1997) ("requir[ing] a determination of what dose-response relationship exists between the element in question and the harm that has possibly been caused"); *Cartwright v. Home Depot U.S.A., Inc.*, 936 F. Supp. 900, 904 (M.D. Fla. 1996) (excluding causation opinions where "[n]either expert made any effort to ascertain or even approximate what level of exposure" plaintiffs had; experts "did not provide any quantification to substantiate in scientific terms what level of exposure would have been sufficient to cause asthma in Plaintiffs or anyone else"); *Whiting v. Boston Edison Co.*, 891 F. Supp. 12, 23 (D. Mass. 1995) (rejecting causation opinion that "[i]n layman's terms . . . assumes that if a lot of something is bad for you, a little of the same thing, while perhaps not equally bad, must be so in some").

scientifically established threshold level. *Smith v. Kelly-Moore Paint Co.*, 307 S.W.3d 829 (Tex. App.—Fort Worth 2010, no pet.); *Georgia-Pacific Corp. v. Stephens*, 239 S.W.3d 304 (Tex. App.—Houston [1st Dist.] 2007, pet. denied).¹⁵

In *Smith v. Kelly-Moore Paint Co.*, the court of appeals rejected an expert's testimony which relied

on the results of “molecular biological studies, animal experiments, epidemiological studies, case reports, and asbestos tissue burden studies” . . . [but included] no evidence of any attempt to correlate the dosages . . . and none of the epidemiological studies show a minimum threshold . . . from which to measure whether [plaintiff] had an elevated risk of mesothelioma. . . . [W]ithout scientific evidence of the minimum exposure level leading to an increased risk of development of mesothelioma . . . [the expert's] opinion lacks [] factual and scientific foundation . . . and, thus, is insufficient to raise a fact issue.

307 S.W.3d at 839. In *Georgia-Pacific Corp. v. Stephens*, the court of appeals, applying *Flores*, found insufficient evidence of causation when there was “no evidence concerning the percentage of Georgia-Pacific joint compound used in comparison to the quantity of other products used on [the plaintiff's] job sites, nor any quantitative estimate of the number of times Georgia-Pacific joint compound

¹⁵ Other state appellate courts have likewise excluded any-exposure opinions that do not account for dosage for the same reasons. *Butler v. Union Carbide Corp.*, 712 S.E.2d 537, 543-44 (Ga. Ct. App. 2011); *Brooks v. Stone Architecture, P.A.*, 934 So.2d 350, 354-55 (Miss. Ct. App. 2006); *McPhee v. Ford Motor Co.*, 2006 WL 2988891, at *4 (Wash. Ct. App. Oct. 16, 2006); *Johnson v. Triangle Insulation*, 2003 WL 21769867, at *3 (Ky. Ct. App. Aug. 1, 2003); see also *Hannan v. Pest Control Services, Inc.*, 734 N.E.2d 674, 680-83 (Ind. Ct. App. 2000) (excluding expert opinion because expert's “protocol for determining whether a chemical has caused a particular illness did not include an analysis of the exposure levels or the dose of the chemical received by the plaintiffs”).

was used on [his] job sites.” 239 S.W.3d at 319. The court of appeals concluded that “although there was evidence that [the plaintiff] was exposed to asbestos-containing joint compound generally, there was no quantitative evidence presented upon which [his] experts [, including Dr. Hammar,] could rely to determine that he was exposed to Georgia-Pacific’s product in sufficient quantities to have increased his risk of developing mesothelioma.” *Id.* As the court of appeals here recognized, the expert opinion by Dr. Hammar that was rejected in *Stephens* bore a striking resemblance to his opinion here. *Bostic*, 320 S.W.3d at 601.

Importantly, these opinions do not indicate – as Plaintiffs would have it – that the courts of appeals’ application of the *Flores* standard makes it impossible for a plaintiff to establish causation in an asbestos-exposure case. It is simply that, in those cases as in this one, the plaintiffs did not present any evidence to meet it. The *Flores* standard is clear as to what a plaintiff must show. It does not require “tracing the fibers from the defendant’s product to the individual disease,” as Plaintiffs insist. Pls.’ Br. Merits at 24. But it *does* require “[d]efendant-specific evidence relating to the approximate dose to which the plaintiff was exposed, coupled with evidence that the dose was a substantial factor in causing the asbestos-related disease,” to establish that the exposure was at least sufficient to cause the disease. *Flores*, 232 S.W.3d at 773. That the plaintiffs in these cases did not even attempt to meet the *Flores* standard and, therefore, failed to do so, does not indicate a flaw in the standard itself.

In short, courts around the country have rejected the any-exposure theory of establishing causation as scientifically and legally incorrect, and have embraced

versions of the *Lohrmann* frequency, regularity and proximity standard, like the substantial-factor standard adopted by this Court in *Flores*. The standard has proved workable and reasonable. There is no reason for this Court to abandon or undermine its considered and correct decision in *Flores*.

D. “Any-Exposure” Expert Opinions Threaten To Usurp The Role Of The Trial Court By Improperly Instructing The Jury On The Legal Causation Standard.

This Court has long recognized that “defining the limits of legal causation ‘eventually mandates weighing of policy considerations’” *Union Pump v. Allbritton*, 898 S.W.2d 773, 775 (Tex. 1995), *abrogated on other grounds by Ford Motor Co. v. Ledesma*, 242 S.W.3d 32 (Tex. 2007) (quoting *City of Gladewater v. Pike*, 727 S.W.2d 514, 518 (Tex. 1987); citing *Springall v. Fredericksburg Hosp. & Clinic*, 225 S.W.2d 232, 235 (Tex. App.—San Antonio 1949, no writ)). As discussed above, that policy determination is embodied in the doctrines of “proximate cause” for negligence cases and “producing cause” for strict liability cases. *See id.* In *Flores*, this Court weighed the policy considerations for asbestos-exposure cases and arrived at the requirement that the defendant’s product be a substantial factor in causing the injury before liability can be imputed.¹⁶ The

¹⁶ The Texas Legislature made a similar policy determination in enacting Chapter 90, “Claims Involving Asbestos and Silica,” although it does not apply to this case. Tex. Civ. Prac. & Rem. Code ch. 90. Moreover, when the Legislature considered the policy question of whether to alter the *Flores* standard, it did not do so, despite Plaintiffs’ suggestion otherwise (Pls’. Br. Merits at 2-3). *See* Tex. S.B. 1123, 81st Leg., R.S. (2009) (Senate Bill 1123 to change *Flores* requirement that plaintiffs provide quantitative evidence of approximate dosage); Tex. H.B. 1811, 81st Leg., R.S. (2009) (House Bill 1811 to do same, which never left committee).

applicable causation standard is a *legal question*, which this Court answered in *Flores*, a question on which trial courts instruct juries. The applicable causation standard is not a *scientific question* on which experts can opine.

Any-exposure opinions are, in essence, an attempt to usurp the court's power to define the legal standard, an explicit attempt to instruct the jury on what a "substantial factor" should be. Experts may not do so. See *Ledbetter v. Missouri Pac. R. Co.*, 12 S.W.3d 139, 144 (Tex. App.—Tyler 1999, pet. denied) ("[W]e are not persuaded that OSHA regulations are applicable simply because witnesses testified that they are. Whether a particular legal principle is applicable in a case or governs a case is a matter of law for the trial court.") (quotation marks and citation omitted); *Welder v. Welder*, 794 S.W.2d 420, 432-33 (Tex. App.—Corpus Christi 1990, no pet.) (an expert may not "testify directly to his understanding of the law, but merely . . . apply legal terms to his understanding of the factual matters in issue"). Experts "may certainly give their opinions concerning the specific facts and factors set out in [the legal standard], but the legal definition and standard . . . is a question of law, not defined by medical experts." *Morris v. State*, 301 S.W.3d 281, 287 (Tex. Crim. App. 2009).

Plaintiffs' experts' any-exposure opinions – that each and every exposure to asbestos increased Mr. Bostic's risk and potentially contributed to his developing mesothelioma – essentially invited the jury to apply a different standard than the *Flores* substantial-factor standard. Dr. Hammar's assertion that "each and every exposure to asbestos is a contributing factor" and "were significant and contributing factors" (11 RR 51-52, 152-53) invite jury nullification of the clear

holding in *Flores* that *de minimis* exposure cannot be a substantial factor in causing an injury. 232 S.W.3d at 770 (citing *Lohrmann*, 782 F.2d at 1162). Such testimony could not possibly be helpful to the jury. *See* Tex. R. Civ. Evid. 702.

Experts cannot instruct the jury on the legal causation standard. It is a trial judge's job to instruct about the law. On questions of law "the tribunal does not need the witness' judgment and hence will insist on dispensing with it." 7 Wigmore on Evidence §1952, at 103 (Chadbourne rev. ed. 1978 & Supp. 1991). "It is still an elementary principle that witnesses are to give evidence as to facts, and not statements of law. The sound reason for this distinction is that, because of his special training and experience, the trial judge is better equipped to determine questions of law and instruct the jury accordingly." *Welder*, 794 S.W.2d at 433 (citing *Withrow v. Shaw*, 709 S.W.2d 759, 760 (Tex. App.—Beaumont 1986, writ ref'd n.r.e.); *Collins v. Gladden*, 466 S.W.2d 629 (Tex. App.—Beaumont 1971, writ ref'd n.r.e.)). "[E]ach courtroom comes equipped with a 'legal expert,' called a judge, and it is his or her province alone to instruct the jury on the relevant legal standards." *Greenberg Traurig of New York, P.C. v. Moody*, 161 S.W.3d 56, 95 (Tex. App.—Houston [14th Dist.] 2004, no pet.) (quotation marks and citation omitted).

While experts may opine on "ultimate" issues (Tex. R. Civ. Evid. 704), they may not testify on improper legal conclusions. *Nat'l Convenience Stores Inc. v. Matherne*, 987 S.W.2d 145, 149 (Tex. App.—Houston [14th Dist.] 1999, no pet.); *Puente v. A.S.I. Signs*, 821 S.W.2d 400, 402 (Tex. App.—Corpus Christi 1991, writ denied). "[A]n expert may state an opinion on a mixed question of law and fact *as*

long as the opinion is confined to the relevant issues and is based on proper legal concepts.” Birchfield v. Texarkana Mem’l Hosp., 747 S.W.2d 361, 365 (Tex. 1987). Thus, experts may testify as to mixed questions of law and fact – such as whether facts meet an established legal standard – but they may not testify as to the standard itself. Holden v. Weidenfeller, 929 S.W.2d 124, 133 (Tex. App.—San Antonio 1996, writ denied); Dickerson v. DeBarbieris, 964 S.W.2d 680, 690 (Tex. App.—Houston [14th Dist.] 1998, no pet.). And expert testimony on an incorrect legal standard – or regarding whether the relevant facts meet an incorrect legal standard – is improper and inadmissible. Lyondell Petrochemical Co. v. Fluor Daniel, Inc., 888 S.W.2d 547, 554 (Tex. App.—Houston [1st Dist.] 1994, writ denied) (“for the opinion to be admitted, the expert must be provided the proper legal concepts with which to analyze those facts”); Harvey v. Culpepper, 801 S.W.2d 596, 601 (Tex. App.—Corpus Christi 1990, no pet.) (holding physician’s opinion about negligence was properly excluded when he was not asked to assume a legally correct definition of negligence before he was asked the ultimate question).

In other words, expert testimony must meet the requirements applicable to testimony generally, and in particular must be “helpful” to the trier of fact, as required by Texas Rule of Civil Evidence 702. *Lyondell*, 888 S.W.2d at 554 (citing *Louder v. De Leon*, 754 S.W.2d 148, 149 (Tex. 1988)). Testimony instructing the jury on an incorrect legal standard or opining that the facts meet such an incorrect standard – as any-exposure expert opinions do – usurps the role of the trial court and cannot be helpful to the trier of fact.

IV. Sound Jurisprudential Policy Weighs Against Further Expansions Of Liability In The Asbestos Causation Area.

Another consideration counsels retention and continued vigorous application of the *Flores* substantial-factor standard: the institutional concern of judicial management of asbestos litigation. Now well into its fourth decade,¹⁷ asbestos litigation has become well-nigh intractable – defying resolution by either legislation, litigation, or even private settlement. While there is more than enough blame to go around, the initial liability-friendly environment created by common-law decisions allowed the defective products of one industry to become an unending litigation morass in which many thousands of defendants producing different products, and the judicial system itself, remain mired. Ultimately, the sound judgment of the common-law courts, applying well-established principles that appropriately delimit liability in tort cases generally, is essential to bringing this overlong legal chapter to a close.

Causation principles like substantial-factor causation and this Court’s *Flores* test serve an important social policy function of cabining strict liability so that it does not become absolute or “insurer” liability of a sort that this Court has rejected.¹⁸ The concept of proximate causation generally serves this function in tort actions, as this Court recognized in *Lear Siegler* where it approved the

¹⁷Asbestos suits have been filed at least since 1969. *Borel v. Fibreboard Paper Products Corp.*, 493 F.2d 1076, 1086 (5th Cir. 1973) (applying Texas law).

¹⁸“The Restatement [(Second), § 402A, Special Liability Of Seller Of Product For Physical Harm To User Or Consumer] does not make a manufacturer an insurer of every person who is injured by one of its products.” *Armstrong Rubber Co. v. Urquidez*, 570 S.W.2d 374, 376 (Tex. 1978).

Restatement’s explanation that proximate causation limits liability to acts for which it is “reasonable” to hold a defendant responsible, and excludes from liability the “great number of events” which could “philosophic[ally]” be considered but-for causes. 819 S.W.2d at 472 (quoting RESTATEMENT (SECOND) OF TORTS § 431 cmt. a). Ultimately, the concepts of proximate and producing causation – both of which are captured by the *Flores* substantial-factor standard – result from “weighing of policy considerations.” *City of Gladewater v. Pike*, 727 S.W.2d 514, 518 (Tex. 1987) (citation omitted). They are practical tests of common experience applied to human conduct, and the result of endeavors by the courts to move beyond, when possible, the metaphysical and philosophical niceties inherent in the time-worn discussion of causation. *Id.*¹⁹

This case serves as an example of the danger faced by allowing principles of causation to become unmoored from the anchors of basic scientific and legal causation principles. Plaintiffs – not the defendant – elected to try this case under the any-exposure theory. Plaintiffs made a tactical decision to ignore Mr. Bostic’s exposure to asbestos other than from Georgia-Pacific products including: (1) Mr. Bostic’s childhood household exposure to asbestos from his father’s work at Knox Glass and fixing automobile brakes; (2) Mr. Bostic’s occupational exposure when he worked as a welder’s assistant for Palestine Contractors; (3) Mr. Bostic’s

¹⁹ This Court has long recognized the ultimately policy-driven nature of assigning liability in tort claims. *See City of Sherman v. Langham*, 42 S.W. 961, 963 (Tex. 1897) (“[I]t is a mere matter of governmental policy whether it is deemed wise to impose upon such property liability for torts, for the commission of which the owners thereof are not responsible”)

occupational exposure when himself working at Knox Glass; (4) Mr. Bostic's automotive mechanical work with a variety of asbestos-containing products over his lifetime; and (5) Mr. Bostic's work remodeling homes using asbestos-containing joint compound after Georgia-Pacific no longer made such a product. *Bostic*, 320 S.W.3d at 594-95. Presumably this tactical decision was made to lower the costs of litigation and to target Georgia-Pacific rather than other bankrupt manufacturers of asbestos-containing products. Consequently, Plaintiffs provided only limited, vague, unquantifiable testimony regarding Mr. Bostic's exposure to asbestos-containing products manufactured by Georgia-Pacific.

By relying entirely upon vague, unquantified allegations of exposure to Georgia-Pacific products, and by asking the court to ignore the rest of Mr. Bostic's employment and exposure history, Plaintiffs seek, in effect, to reverse the burden of proof, forcing Georgia-Pacific to prove that other exposures were the "real" cause of his injury. This gambit is completely improper and cannot be sanctioned. Basic principles of tort law, and all of this Court's precedent, place the burden of proving causation upon the plaintiff, not the defendant. *See Flores*, 232 S.W.3d at 773.

That Plaintiffs even considered ignoring Mr. Bostic's numerous and substantial other sources of occupational and household asbestos exposure speaks volumes about the depths to which asbestos litigation has sunk. It has ceased to be a vehicle by which truly culpable parties are compelled to answer for harm they actually caused, and instead has become a legally unprincipled game to impose liability on an ever wider spectrum of defendants and their insurers. The insatiable

appetite of asbestos litigation for new infusions of cash from new sets of defendants demands not the further loosening of proof requirements – but rather a frank recognition that the rational limits to liability have been exceeded.

This Court and the Texas Legislature have recognized the dangers inherent in the “asbestos litigation crisis that has already bankrupted many companies, resulting in lost jobs and a burden on the State’s economy.” *Robinson v. Crown Cork & Seal Co., Inc.*, 335 S.W.3d 126, 149 (Tex. 2010) (citing Act of May 16, 2005, 79th Leg., R.S., ch. 97, § 1, 2005 Tex. Gen. Laws 169). The United States Supreme Court has aptly described that crisis as “the elephantine mass of asbestos cases . . . [that] defies customary judicial administration and calls for national legislation.” *Ortiz v. Fibreboard Corp.*, 527 U.S. 815, 821 (1999); *Amchem Prods., Inc. v. Windsor*, 521 U.S. 591, 598 (1997) (“The most objectionable aspects of asbestos litigation can be briefly summarized: dockets in both federal and state courts continue to grow; long delays are routine; trials are too long; the same issues are litigated over and over; transaction costs exceed the victims’ recovery by nearly two to one; exhaustion of assets threatens and distorts the process; and future claimants may lose altogether.”) (*quoting* Report of The Judicial Conference Ad Hoc Committee on Asbestos Litigation 2–3 (Mar. 1991)). If asbestos claims are not cabined by a vigorously and consistently enforced substantial-factor causation standard – based in sound scientific principles – then more suits like this, seeking to ignore a lifetime of occupational exposure for something easier to prove (and in reality merely to assert), will follow.

Nor can there be any argument that a lesser liability standard is necessary to provide industry with “incentives” to make products safer. If ever there were a situation where further deterrence is unnecessary, this is it. Almost all of the actual manufacturers of asbestos products have already been bankrupted by this litigation, and asbestos itself has been off the market for many years. Expansion of liability as advocated by Plaintiffs would go beyond deterrence into the realm of overkill. Strict liability already provides plenty of deterrence. Adding liability for “any exposure” to all the other benefits that strict liability plaintiffs already enjoy would only exacerbate the asbestos litigation crisis gripping affected industries, this State, and the entire nation.

PRAYER

For the foregoing reasons, *amicus curiae* Product Liability Advisory Council, Inc. respectfully urges this Court to affirm the Court of Appeals, and hold that Plaintiffs failed to present evidence to satisfy the *Flores* substantial factor causation test.

Respectfully submitted,

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Dated: August 19, 2013

CERTIFICATE OF COMPLIANCE

Relying on the word count function of the computer software used to prepare this document, the undersigned certifies that the foregoing Brief Of *Amicus Curiae* Product Liability Advisory Council, Inc. In Support Of Respondent Georgia-Pacific Corporation contains 11,758 words (excluding the sections excepted under TEX. R. APP. P. 9.4(h)(i)(1)).

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CERTIFICATE OF SERVICE

I hereby certify that on this 20th day of August, 2013 a true and correct copy of the foregoing Brief Of *Amicus Curiae* Product Liability Advisory Council, Inc. In Support Of Respondent Georgia-Pacific Corporation has been forwarded via electronic service to the following attorneys of record:

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