No. 2016-1770

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BASF CORPORATION,

Plaintiff-Appellant,

v.

JOHNSON MATTHEY INC.,

Defendant-Appellee.

Appeal from the United States District Court for the District of Delaware, case no. 1:14-cv-01204-SLR-SRF, Judge Sue L. Robinson

REPLY BRIEF FOR APPELLANT BASF CORPORATION

RACHEL KREVANS
MORRISON & FOERSTER LLP
425 Market Street
San Francisco, CA 94105

DEANNE E. MAYNARD
DANIEL P. MUINO
MARC A. HEARRON
SETH W. LLOYD
MORRISON & FOERSTER LLP
2000 Pennsylvania Avenue, N.W.
Washington, D.C. 20006
Telephone: 202.887.8740
DMaynard@mofo.com

Counsel for Appellant BASF Corporation

MARCH 23, 2017

CERTIFICATE OF INTEREST

Counsel for appellant BASF Corporation certifies the following:

1. The full name of every party or amicus represented by me is:

BASF Corporation

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

N/A

3. All parent corporations and any publicly held companies that own 10% or more of the stock of the party or amicus curiae represented by me are:

BASF Corporation is a wholly owned subsidiary of BASF Americas Corporation. BASF Americas Corporation is a wholly owned subsidiary of BASFIN Corporation. BASFIN Corporation is a majority owned subsidiary of BASF USA Holding LLC, a Delaware limited liability company. BASF USA Holding LLC is a wholly owned subsidiary of BASF Nederland BV, a Dutch limited liability company. BASF Nederland BV is a wholly owned subsidiary of BASF SE (Societas Europaea – "SE"), a publicly traded European company.

No public corporation, company or other publicly held entity owns 10% or more of the stock of BASF Corporation.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or are expected to appear in this court are:

MORRISON & FOERSTER LLP: Rachel Krevans, Deanne E. Maynard, Daniel P. Muino, Marc A. Hearron, Jayson L. Cohen, Michelle Yang, Seth W. Lloyd

MORRIS, NICHOLS, ARSHT & TUNNELL LLP: Mary B. Graham, Thomas J. Curry

Dated: March 23, 2017 /s/ Deanne E. Maynard

TABLE OF CONTENTS

CERTIFICATE OF INTEREST i

TABLE OF CONTENTS ii

TABLE OF AUTHORITIES iv

INTRODUCTION 1

ARGUMENT 3

I. THE INTRINSIC RECORD INFORMS AN ORDINARILY SKILLED ARTISAN OF THE CLAIMS' SCOPE WITH REASONABLE CERTAINTY 3

A. JMI Does Not Dispute That This Court's Review Is De Novo In All Respects 3

B. The Material Composition Limitations Should Be Construed As Having The Full Breadth Of Their Ordinary Meanings 4

1. Abandoning the district court's rationale, JMI does not dispute that "effective" has an ordinary meaning 4

2. The specification does not limit the scope of the material composition limitations 7

3. JMI cannot distinguish this Court's decisions approving the use of functional limitations and giving "effective" its full scope 15

a. Functional language may be used for "critical" limitations and for limitations other than amount, time, and temperature 15

b. Functional limitations cover any and all embodiments that perform the recited function 19

C. The Intrinsic Evidence Establishes That A Skilled Artisan Would Understand The Scope Of The Claims With Reasonable Certainty 21

1. The ’185 patent provides reasonable certainty 21

2. The specification’s disclosure of various conditions in which an exhaust engine may operate does not establish indefiniteness 25

II. THE EXTRINSIC EVIDENCE ALSO COMPELS THE CONCLUSION THAT THE CLAIMS ARE NOT INDEFINITE 28

A. Under the Correct Construction, The Extrinsic Evidence Establishes That The Claims Are Not Indefinite 28

B. JMI Cannot Use Extrinsic Evidence To Vary The Clear Meaning Of The Claim Language.....30

CONCLUSION.....32

TABLE OF AUTHORITIES

Page(s)

CASES

Abbott Labs. v. Baxter Pharm. Prods., Inc.,
334 F.3d 1274 (Fed. Cir. 2003) 5, 8, 9, 17, 18, 20

Ancora Techs., Inc. v. Apple, Inc.,
744 F.3d 732 (Fed. Cir. 2014) 9, 23, 29

Biosig Instruments, Inc. v. Nautilus, Inc.,
783 F.3d 1374 (Fed. Cir. 2015) 3, 6

Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.,
424 F.3d 1293 (Fed. Cir. 2005) 5, 19

DDR Holdings v. Hotels.com,
773 F.3d 1245 (Fed. Cir. 2014) 23, 29, 30

Dow Chem. Co. v. Nova Chems. Corp. (Canada),
803 F.3d 620 (Fed. Cir. 2015) 26

Enzo Biochem, Inc. v. Applera Corp.,
599 F.3d 1325 (Fed. Cir. 2010) 24, 27

Geneva Pharm., Inc. v. GlaxoSmithKline PLC,
349 F.3d 1373 (Fed. Cir. 2003) 18, 19, 20

Hill-Rom Servs., Inc. v. Stryker Corp.,
755 F.3d 1367 (Fed. Cir. 2014) 6, 19, 22

Honeywell Int'l, Inc. v. ITC,
341 F.3d 1332 (Fed. Cir. 2003) 26

Howmedica Osteonics Corp. v. Wright Med. Tech., Inc.,
540 F.3d 1337 (Fed. Cir. 2008) 30

In re Caldwell,
319 F.2d 254 (C.C.P.A. 1963) 15

In re Swinehart,
439 F.2d 210 (C.C.P.A. 1971) 4, 6, 16, 17, 19, 22

Innova/Pure Water, Inc. v. Safari Water Filtration Sys.,
381 F.3d 1111 (Fed. Cir. 2004) 4, 8, 20, 25

Leggett & Platt, Inc. v. VUTEk, Inc.,
537 F.3d 1349 (Fed. Cir. 2008) 5

Locklin v. Switzer Bros.,
299 F.2d 160 (9th Cir. 1961) 18

Mentor Graphics Corp. v. Eve-USA, Inc.,
--- F.3d ----, 2017 WL 1024502 (Fed. Cir. Mar. 16, 2017) 24

Nautilus, Inc. v. Biosig Instruments, Inc.,
134 S. Ct. 2120 (2014) 21

Orthokinetics, Inc. v. Safety Travel Chairs, Inc.,
806 F.2d 1565 (Fed. Cir. 1986) 27

SmithKline Beecham Corp. v. Apotex Corp.,
403 F.3d 1331 (Fed. Cir. 2005) 6, 31

Sonix Tech. Co. v. Publications Int'l, Ltd.,
844 F.3d 1370 (Fed. Cir. 2017) 9, 24

Source Search Techs., LLC v. LendingTree, LLC,
588 F.3d 1063 (Fed. Cir. 2009) 28

Straight Path IP Grp. v. Sipnet EU S.R.O.,
806 F.3d 1356 (Fed. Cir. 2015) 8, 9

Teva Pharm. USA, Inc. v. Sandoz, Inc.,
789 F.3d 1335 (Fed. Cir. 2015) 9, 26

Thorner v. Sony Comput. Entm't Am. LLC,
669 F.3d 1362 (Fed. Cir. 2012) 8, 20

Vitronics Corp. v. Conceptronic, Inc.,
90 F.3d 1576 (Fed. Cir. 1996) 9, 30, 31

Wi-Lan, Inc. v. Apple Inc.,
811 F.3d 455 (Fed. Cir. 2016) 30

STATUTES

35 U.S.C. § 282 7

INTRODUCTION

As BASF demonstrated in its opening brief, the material composition limitations of the '185 patent use a functional term, "effective," that has a well-established ordinary meaning: a material is "effective" for performing a function if the material can perform the function. No legal principle mandates that a limitation reciting "effective" must specify *how* effective a material must be to fall within the limitation. The claims here thus must be given their full scope—they cover any materials that can perform the recited catalyst functions, as understood in the art of exhaust systems. Indeed, giving the claims their ordinary meaning is consistent with what was invented: an architecture in which catalysts are arranged, *not* catalysts themselves. Any SCR catalyst and ammonia oxidation catalyst, as understood in the art, can be arranged in the architecture disclosed and claimed in the '185 patent. It is the arrangement that is novel.

In response, JMI tellingly leads its brief with four pages apparently directed to issues other than indefiniteness, even though indefiniteness is the only issue on appeal, as JMI's own Statement of the Issue confirms. JMI Br. 1, 3-6. When JMI does address indefiniteness, it largely does not dispute the general principles on which BASF relies. Nor does it defend the principal rationale for the district court's indefiniteness ruling.

Instead, the core of JMI's argument—which the district court did not adopt—is that a statement in the specification overrides what all now agree is the claim term's ordinary meaning. JMI argues that the specification discloses that a material must have some minimum level of catalyst function to fall within the claimed material composition limitations. But JMI misreads the specification, divorcing phrases from their broader context. In any event, as this Court has held time and again, unless the patentee acts as lexicographer or clearly disavows claim scope, claim terms are entitled to the full breadth of their ordinary meaning. JMI does not suggest either exception applies here.

Under the correct construction, the intrinsic evidence establishes that the claims are not indefinite. The specification defines the functions to be performed, makes clear that materials that perform those functions were well known in the art, equates the claimed materials with terms having a well-defined meaning, and provides numerous examples of materials that perform the functions. That is more than enough to provide reasonable certainty. And contrary to JMI's assertion, the claims here need not specify a method for measuring whether a material meets a minimum level of function because the claims do not require any minimum level of function.

If this Court reaches the extrinsic evidence, it too compels reversal. As BASF explained, under the correct construction of the material composition

limitations, extrinsic evidence establishes that skilled artisans understand with reasonable certainty the materials that are effective to perform the recited functions. JMI relies on extrinsic evidence to argue that the material composition limitations require some minimum level of function. But extrinsic evidence cannot alter the claims' meaning.

The indefiniteness judgment should be reversed and the case remanded for proceedings on infringement.

ARGUMENT

I. THE INTRINSIC RECORD INFORMS AN ORDINARILY SKILLED ARTISAN OF THE CLAIMS' SCOPE WITH REASONABLE CERTAINTY

A. JMI Does Not Dispute That This Court's Review Is De Novo In All Respects

As BASF explained in its opening brief, because the district court's indefiniteness ruling was based entirely on intrinsic evidence, it is a purely legal determination subject to de novo review in all respects. BASF Br. 25-28 (citing *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1378 (Fed. Cir. 2015)). In its response brief, JMI does not contend there are any underlying factual findings to which deference would be owed. *See* JMI Br. 24. Nor does JMI suggest there are any factual disputes that would preclude this Court from deciding the indefiniteness question without a remand. JMI Br. 44. It is thus undisputed that this Court's review is without deference.

B. The Material Composition Limitations Should Be Construed As Having The Full Breadth Of Their Ordinary Meanings

1. Abandoning the district court's rationale, JMI does not dispute that "effective" has an ordinary meaning

JMI does not defend the principal rationale for the district court's ruling. Unlike JMI's argument in this Court (JMI Br. 27), the district court did not rely on anything particular about the disclosures in the '185 patent. Instead, the district court reasoned that any claim with a functional limitation must "recite a minimum level of function" or else it is indefinite. Appx5. Because "effective" is a functional term, the district court held the claims at issue indefinite for failing to "recite a minimum level of function needed to meet this 'effective' limitation." Appx5.

As BASF demonstrated, that rationale is legally incorrect: claims with functional limitations need not recite any minimum level of function. BASF Br. 33-37. Instead, "[b]y its own literal terms a claim employing such language covers any and all embodiments which perform the recited function." *In re Swinehart*, 439 F.2d 210, 213 (C.C.P.A. 1971). This is not a special rule for functional limitations; it is an application of the general principle that claim terms are "typically construed as having their full meaning." *Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1118 (Fed. Cir. 2004). On appeal,

JMI does not appear to dispute this general rule; instead, its indefiniteness argument depends on the particular disclosures of the '185 patent. JMI Br. 27.

JMI also does not dispute what the ordinary meaning of "effective" is: a material composition "effective" for a function is a composition that can perform the function. BASF Br. 28. As BASF explained (at 30-32), this Court repeatedly has construed "effective" or "effectively" to refer to any material or amount that can perform the recited function. *See Leggett & Platt, Inc. v. VUTEk, Inc.*, 537 F.3d 1349, 1354 (Fed. Cir. 2008) (equating "effective to" with "able to"); *Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1306 (Fed. Cir. 2005) (equating "effectively" with "operatively"); *Abbott Labs. v. Baxter Pharm. Prods., Inc.*, 334 F.3d 1274, 1277 (Fed. Cir. 2003) ("[T]he term 'effective amount' has a customary usage," referring to the amount that will perform the function.). Nor does JMI dispute that "effective" in the asserted claims carries the meaning that a person of skill in the art of exhaust systems would give it. BASF Br. 38.

Additionally, the parties agree that the limitations' breadth does not make them indefinite. To be sure, JMI repeatedly argues that if the material composition limitations are construed as encompassing any material that can perform the recited functions, then the limitations have a broad scope. *E.g.*, JMI Br. 33. But JMI never actually suggests that a broad scope would render the claims indefinite. As

BASF explained (at 40), "breadth is not indefiniteness." *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1341 (Fed. Cir. 2005) (brackets omitted). JMI ultimately agrees: "Johnson Matthey does not argue that the claims are indefinite because they are broad." JMI Br. 43-44.

Despite all of this common ground, JMI tries to make BASF's plain-meaning position appear unreasonable by repeatedly asserting that it would encompass materials that catalyze only to an "infinitesimal degree." *E.g.*, JMI Br. 23. But that focuses on the wrong question. Under this Court's precedent, the question is whether a person of skill in the art of exhaust systems would consider the material one for performing the recited catalyst functions. *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1375 (Fed. Cir. 2014). If so, the material falls within the scope of the "effective" limitations, regardless of the degree to which it performs the function. *Swinehart*, 439 F.2d at 213. That is enough to provide reasonable certainty. *Biosig*, 783 F.3d at 1382-83.

Indeed, JMI's position on claim 17's "material composition A" limitation shows that what it is really complaining about is breadth, not indefiniteness. JMI argues that limiting the term "material composition A effective for catalyzing" to "material composition A comprising a precious metal effective for catalyzing" renders that limitation not indefinite. JMI Br. 7-8 & n.1, 37. But that makes no sense if the problem really is, as JMI says, that a skilled artisan would have no idea

how much catalytic activity is necessary to satisfy the claims. Adding "comprising a precious metal" does nothing to address that issue; it only makes the limitation narrower. In any event, by conceding that "material composition A comprising a precious metal effective for catalyzing" is not indefinite, JMI necessarily concedes that "effective for catalyzing" does not make the limitation indefinite. That concession applies just as much to every "effective" limitation in the claims, including claim 17's "material composition B."[1]

2. The specification does not limit the scope of the material composition limitations

JMI's primary indefiniteness theory is that the "specification of the '185 patent discloses that something more than an infinitesimal degree of AMOx or SCR catalyst function is needed for a composition to be effective for catalyzing the AMOx or SCR catalyst reaction." JMI Br. 27. JMI argues this renders the claims indefinite because "[t]he specification, however, never says how much

[1] JMI suggests that BASF's position "shifted" in the district court and that the argument BASF presses here was not raised there until BASF's reply. JMI Br. 20. JMI had the burden to prove the claims indefinite by clear and convincing evidence, 35 U.S.C. § 282, and BASF thus properly raised its response to that defense in its reply, to which (as JMI acknowledges) JMI was allowed a sur-reply. JMI Br. 20. JMI does not suggest there was any waiver, nor did the district court conclude any argument was waived. Moreover, BASF has consistently sought the same claim scope throughout the proceedings—the material composition limitations take their ordinary meanings, as understood in the art of exhaust systems. *E.g.*, Appx85.

more." *Id*. JMI made this argument in the district court (Appx1395), but the court did not adopt it. It should fare no better here for two separate reasons.

First, JMI's argument requires reading a limitation into the claims from the specification, in violation of a cardinal rule of claim construction that "[i]t is the claims that define the metes and bounds of the patentee's invention." *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012). This Court "do[es] not read limitations from the specification into claims." *Id.* at 1366. Rather, each claim limitation is construed as having "the full breadth of its ordinary meaning." *Innova*, 381 F.3d at 1120; *see Abbott*, 334 F.3d at 1277, 1279-80 (not limiting "effective amount" to a precise range from the specification).

"There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Thorner*, 669 F.3d at 1365. JMI does not argue that either exception applies here. With good reason: JMI could not meet the "exacting" standards for those exceptions. *Id.* at 1366.

Instead, JMI suggests it is using the specification to interpret the meaning of "effective." JMI Br. 26-27. But where the claim terms have a plain meaning and there is no ambiguity to resolve, "[t]he specification plays a more limited role." *Straight Path IP Grp. v. Sipnet EU S.R.O.*, 806 F.3d 1356, 1361 (Fed. Cir. 2015).

In such circumstances, "it is particularly difficult to conclude that the specification reasonably supports a different meaning," absent clear redefinition or disavowal. *Id.*; *see Ancora Techs., Inc. v. Apple, Inc.*, 744 F.3d 732, 738 (Fed. Cir. 2014). That is the case here: it is undisputed that "effective" has an ordinary meaning. *Supra* p. 5; *see* BASF Br. 30-31; *Abbott*, 334 F.3d at 1277. JMI never suggests there is some ambiguity in the ordinary meaning of "effective" that only the specification can resolve. Instead, JMI is improperly using the specification to try to limit the claims.[2]

Second, and in any event, JMI's reading of the specification is wrong. JMI Br. 14-18, 27-28. JMI relies on Example 6, which compares two sample catalyst systems: "Catalyst P" and "Catalyst Q." Appx28 (col.17:57-col.18:12). JMI plucks the phrases "SCR-only catalyst" and "AMOx-only parts" from Example 6 and takes them out of context to contend that they demonstrate that the material composition limitations "require a threshold conversion percentage that is more

[2] JMI also points to expert testimony about the meaning of Example 6 in the specification. JMI Br. 34. But extrinsic evidence cannot "alter the scope of the claims." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996). And assessing claim scope based on the context and meaning shown by the specification is legal analysis, not a factual question suitable for expert testimony. *Sonix Tech. Co. v. Publications Int'l, Ltd.*, 844 F.3d 1370, 1376 (Fed. Cir. 2017) (quoting *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1342 (Fed. Cir. 2015)).

than just trace amounts." JMI Br. 15. But when viewed in the context discussed below, those phrases do not support JMI's argument.

Catalyst P is an integrated SCR+AMOx catalyst system according to the architecture disclosed in the '185 patent. Appx28 (col.17:30-32, col.18:8-9). As BASF's opening brief discussed (at 7-10, 12-14), an integrated SCR+AMOx catalyst system has a substrate with two catalyst "zones": an "upstream SCR zone" and a "downstream AMOx zone." Appx25 (col.12:37-41). The upstream SCR zone has a washcoat layer containing an SCR catalyst. Appx25 (col.11:15-16). The downstream AMOx zone has two washcoat layers: an overcoat layer with an SCR catalyst and an undercoat layer with an ammonia oxidation catalyst. Appx25 (col.11:16-20). In operation, the exhaust passes through the upstream SCR zone, which "is primarily responsible for removing NO_x emissions from the exhaust by ammonia selective catalytic reduction reaction." Appx25 (col.12:37-39). The exhaust then passes through the downstream AMOx zone, which "is primarily responsible for the ammonia oxidation function." Appx25 (col.12:40-41).

The integrated SCR+AMOx catalyst architecture is illustrated in Figures 1(a) and 1(b) below, with the upstream SCR zone labeled "140" and the downstream AMOx zone labeled "130":

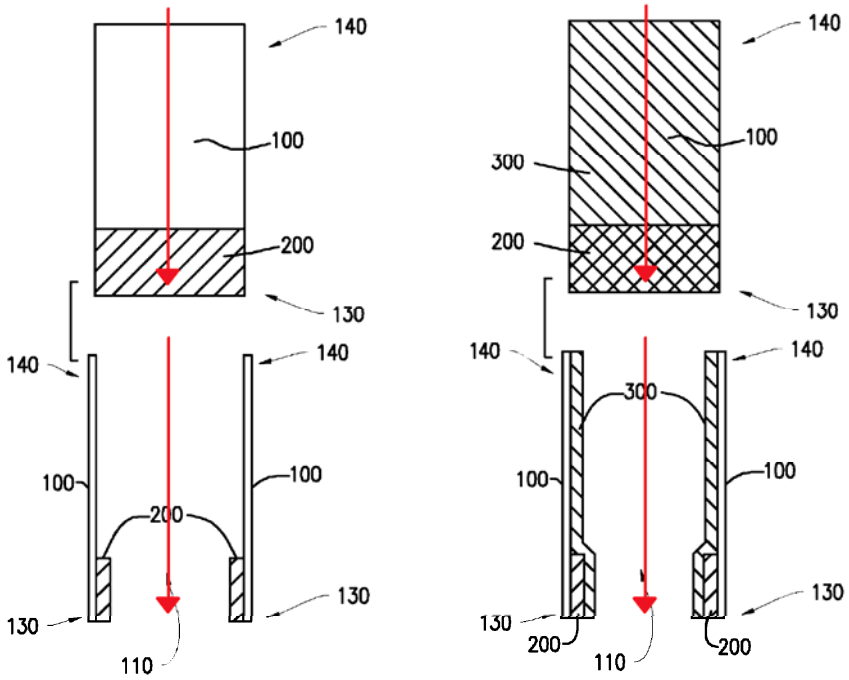


FIG. 1(a) FIG. 1(b)

Appx10 (arrows added to indicate direction of gas flow); *see* Appx24 (col.10:55-56). Figure 2 below illustrates a cross-section of the downstream AMOx zone and shows excess ammonia passing through both layers to convert into nitrogen gas:

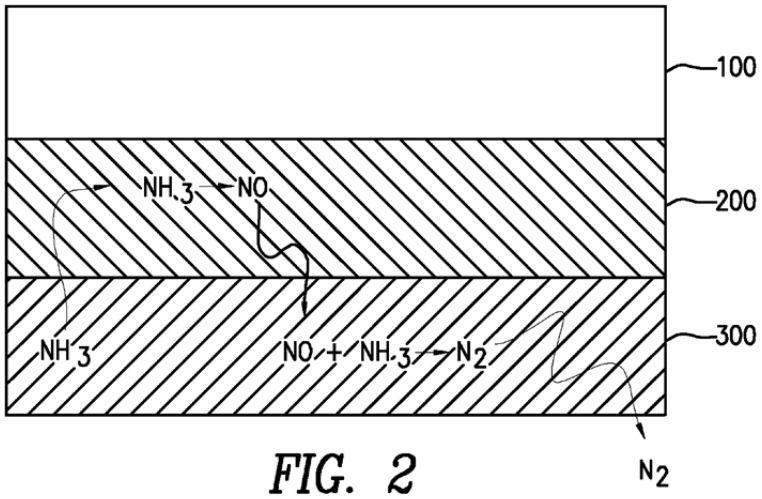


FIG. 2

Appx11 (showing chamber wall (100), undercoat layer with ammonia oxidation catalyst (200), and overcoat layer with SCR catalyst (300)); Appx25 (col.12:18-27).

As it is an integrated SCR+AMOx catalyst system, Catalyst P in Example 6 is described as having two zones: (1) an "SCR-only zone" and (2) an "AMOx zone." Appx28 (col.17:26-30). The SCR-only zone contains copper chabazite (CuCHA), an SCR catalyst. Appx28 (col.17:27-28). The AMOx zone has two layers: an undercoat layer containing platinum (Pt), which catalyzes ammonia oxidation, and an overcoat layer containing copper chabazite, which reduces NOx created by the ammonia oxidation process. Appx28 (col.17:28-30). The word "only" in "SCR-only zone" does not indicate that SCR is the only catalytic functionality of copper chabazite. Rather, it refers to a zone that contains only a material chosen specifically for its ability to perform SCR catalysis—in contrast to the "AMOx zone," which has both an overcoat SCR catalyst layer and an undercoat ammonia oxidation catalyst layer.

Catalyst Q is not an integrated SCR+AMOx catalyst system. Rather, running along the entire length of the Catalyst Q substrate is a single layer containing copper chabazite but not platinum. Appx28 (col.17:32-36). Thus, Catalyst Q has a single zone with an architecture equivalent to the SCR-only zone of Catalyst P.

Example 6 compares the rate of ammonia oxidation in Catalysts P and Q. In discussing the comparison, the specification refers to the two-zoned Catalyst P as "the integrated SCR+AMOx catalyst P," and it refers to the single-zoned, uniform Catalyst Q as "the *SCR-only* catalyst Q." Appx28 (col.18:6-9) (emphasis added). The specification explains: "The data show that the SCR-only catalyst Q can oxidize ammonia at high temperatures (T_{50}=330º C.), but that the T_{50} for NH_3 lightoff is moved to approximately 250º C. in the integrated SCR+AMOx catalyst P." Appx28 (col.18:5-9); *see* Appx18 (Figure 10); Appx28 (Table 2).

JMI latches onto the phrase "SCR-only catalyst" and infers from this that the catalyst material used in Catalyst Q "is not an AMOx catalyst," even though Catalyst Q can catalyze ammonia oxidation to some degree. JMI Br. 17 (emphasis omitted); *see* JMI Br. 27-28. JMI thus concludes that there must be some amount of ammonia oxidation that is "not enough" to be an AMOx catalyst within the meaning of the claims. JMI Br. 15. But in context, "SCR-only" is merely shorthand to distinguish the single-zoned Catalyst Q (which does not have the structure claimed in the patent) from the two-zoned "integrated SCR+AMOx catalyst P" (which does). Appx28 (col.18:5-9). Contrary to JMI's inference, nothing about the phrase "SCR-only catalyst Q" suggests that the catalyst material in Catalyst Q is "effective" to catalyze only SCR, not ammonia oxidation. Nor

does anything about that phrase suggest that materials must have some threshold level of catalyst function before they are considered "effective."

JMI makes a similar mistake with its reliance on Example 6's reference to "AMOx-only parts." JMI argues that this phrase refers to platinum or some other precious metal even though they were "used as SCR catalysts under some conditions," and JMI thus infers that some minimal functionality must be required for a material to be an SCR catalyst. JMI Br. 18, 28. But JMI is misreading the phrase "AMOx-only parts." Here, too, context is important. Before discussing Example 6, the specification discusses numerous sample catalyst systems that were not two-zoned, integrated SCR+AMOx catalyst systems. Appx26-27 (col.13:61-col:15:17 & Table 1). These catalyst systems had only an AMOx zone running the entire length of the substrate. Appx26 (col.13:63-col.14:24 & Table 1). As in the two-layer AMOx zone depicted in Figure 2, *supra* p. 14, the full-length AMOx zone in most of these catalyst systems had an undercoat layer containing an ammonia oxidation catalyst and an overcoat layer containing an SCR catalyst. Appx26 (col.13:63-col.14:24 & Table 1).

The passage to which JMI points in Example 6 contrasts the expected performance of the two-zoned, integrated SCR+AMOx catalyst P of the invention with that of the "AMOx-only parts above." Appx28 (col.17:66-col.18:1). "AMOx-only parts above" thus does not mean platinum or any particular catalyst

material; it refers to the sample catalyst systems with only an AMOx zone, which the specification had described above Example 6.

In short, nothing in these passages suggests that a material must meet some threshold level of function to be considered "effective," much less justifies giving that claim term anything other than its ordinary meaning.

3. JMI cannot distinguish this Court's decisions approving the use of functional limitations and giving "effective" its full scope

BASF discussed a long line of decisions applying the principle that functional limitations need not specify a minimum level of function but rather cover all embodiments that perform the recited function. BASF Br. 30-37. JMI tries two tacks to distinguish this authority, but neither succeeds.

a. Functional language may be used for "critical" limitations and for limitations other than amount, time, and temperature

JMI suggests that functional limitations cannot be used "to define a *critical* claim limitation." JMI Br. 36 (emphasis by JMI). Citing *In re Caldwell*, 319 F.2d 254 (C.C.P.A. 1963), JMI argues that functional limitations may be used "to define some 'uncritical' limitation, such as an amount, time, or temperature" but not the composition itself. JMI Br. 36.

Contrary to JMI's suggestion (at 2, 35-36), post-*Caldwell* precedent holds that functional language may be used to define "critical" limitations. This Court's

predecessor so held in *Swinehart*. 439 F.2d at 212. The claim at issue there was directed to a composition comprising two components combined in certain proportions and in a way that the combination is "transparent to infrared rays." *Id.* at 211. The composition's two components were both well known in the prior art. *Id.* Transparency was the invention's "exact point of novelty." *Id.* The Patent Office rejected the proposed claim as indefinite because it used the functional limitation, "transparent to infrared rays." *Id.* at 211-12.

This Court's predecessor reversed the indefiniteness rejection, concluding that the language was sufficiently clear. *Id.* at 212-14. The court observed that, with respect to functional language, "prior cases have hinted at a possible distinction in this area depending on the criticality of the particular point at which such language might appear." *Id.* at 212. The court explained that "any concern over the use of functional language at the so-called 'point of novelty' stems largely from the fear that an applicant will attempt to distinguish over a reference disclosure by emphasizing a property or function which may not be mentioned by the reference and thereby assert that his claimed subject matter is novel." *Id.* The court rejected these concerns, noting that the law already precluded the patenting of any function or property "inherently possessed by things in the prior art." *Id.* at 212-13. The court went on to conclude that "there is no support, either in the actual holdings of prior cases or in the statute, for the proposition, put forward

here, that 'functional' language, in and of itself, renders a claim improper." *Id.* at 213.

Swinehart also made clear that functional language is not limited to defining amounts or proportions but may be used to define the composition itself. The court explained: "The solicitor, it appears, would also treat the question of what is being defined as important. He distinguishes a case relied on by appellants as 'irrelevant' since the functional term there permitted dealt with novel proportions in a composition whereas here the question is 'whether novelty in structure can be precisely defined in wholly functional terms.'" *Id.* at 212 n.4. The court rejected that contention: "we are unable to see merit in any proposition which would require the denial of a claim solely because of the type of language used to define the subject matter for which patent protection is sought." *Id.*

JMI cites no decision overruling *Swinehart* nor any post-*Swinehart* authority suggesting that functional language may be used only to define limitations that are not "critical." Notwithstanding *Swinehart*, JMI tries to distinguish *Abbott* and *Geneva* by arguing that the functional language in those decisions was used "to define an 'uncritical' amount." JMI Br. 36. That attempt is unavailing. As BASF discussed in its opening brief (at 31, 35-37), *Abbott* gave "effective amount" its ordinary meaning, construing it as not limited to any particular amount but rather as the amount "needed" to perform the recited function. 334 F.3d at 1278. And

Geneva construed "synergistically effective amount" as "any dosage amount that can achieve therapeutic synergy." *Geneva Pharm., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1383-84 (Fed. Cir. 2003). Both decisions thus construe "effective" as encompassing any amount that can perform the recited functions.

These holdings cannot be avoided by characterizing the amounts at issue as "uncritical" (JMI Br. 36); they were not. In *Abbott*, the functional limitation was "amount effective to prevent degradation by a Lewis acid of said quantity of sevoflurane." 334 F.3d at 1276. The amount of Lewis acid was crucial: the point of the invention was "preventing the degradation of sevoflurane anesthetic by adding an effective amount of certain specific Lewis acid inhibitors." *Id.* The amount also was critical in *Geneva*. There, the patentee emphasized that the "synergistically effective amount" limitation was "the possible point of patentable distinction." 349 F.3d at 1383.

In any event, even if functional language were permissible only for "uncritical" limitations, the functional limitations here are not "critical." *See Locklin v. Switzer Bros.*, 299 F.2d 160, 164 (9th Cir. 1961) (pre-*Swinehart* decision stating that "critical" limitations "impart patentability"). As BASF explained (at 40-41) and JMI does not dispute (JMI Br. 3-4), the SCR and ammonia oxidation catalysts were not the point of novelty here. The inventors did not develop or discover new catalysts; they developed a novel architecture for arranging catalysts.

Any SCR catalyst and ammonia oxidation catalyst can be arranged into the claimed architecture. It is the arrangement that is novel—not the selection of particular catalysts.[3]

b. Functional limitations cover any and all embodiments that perform the recited function

JMI also tries to distinguish *Swinehart*, *Cross Medical*, and *Hill-Rom*. JMI Br. 38-39. As noted, *Swinehart* held that a functional limitation covers all embodiments performing the recited function. 439 F.2d at 213; *see Geneva*, 349 F.3d at 1384 (reiterating *Swinehart*'s holding). In *Cross Medical*, this Court equated "effectively" with "operatively," which is a functional term requiring structure that can perform the named function. 424 F.3d at 1306. And in *Hill-Rom*, the Court held that "the patentee is entitled to the full range" of the functional term "datalink" and construed that term as "any link over which data is transferred." 755 F.3d at 1374-75.

JMI bases its attempt to distinguish these decisions on a faulty premise: that the functional limitations were construed as having their full scope only because

[3] Contrary to JMI's assertion, BASF did not state that the specification demonstrates improved performance in any embodiment of the invention, "regardless of which catalysts are used." JMI Br. 29 (emphasis omitted). BASF's statement was narrower: BASF explained that the inventors conducted experiments and that in each tested architecture, "the layered architecture outperformed the mixed architecture regardless of which SCR catalyst and ammonia oxidation catalyst were used." BASF Br. 14-15.

"the intrinsic evidence supported such an interpretation." JMI Br. 38. That attempt doubly fails. First, that supposed legal principle provides no basis to distinguish this case—the specification here likewise supports such an interpretation. *Supra* Part I.B.2.

Second, no such legal principle exists. JMI cites no authority for its assertion that functional limitations are construed as having their full scope only if "the specification consistently describe[s] the functional terms as broadly encompassing any degree of function." JMI Br. 39. To the contrary, in *Abbott* and *Geneva*, this Court construed "effective amount" and "synergistically effective amount" as having their full breadth even though embodiments in the specification identified specific ranges as effective amounts. *Abbott*, 334 F.3d at 1279-80; *Geneva*, 349 F.3d at 1383-84. The correct rule—which *Swinehart*, *Cross Medical*, *Hill-Rom*, *Abbott*, and *Geneva* applied to functional limitations—is that a claim term is construed as having "the full breadth of its ordinary meaning," *Innova*, 381 F.3d at 1120, unless the patentee acts as a lexicographer or disavows the full scope, *Thorner*, 669 F.3d at 1365.

* * *

Accordingly, the indefiniteness ruling should be reversed and the material composition limitations should be given their plain meaning. A "material composition A effective for catalyzing NH3 oxidation" (Appx29 (col.19:46-47)) is

a material that can catalyze ammonia oxidation, as understood in the art of exhaust systems. And a "material composition B effective to catalyze selective catalytic reduction (SCR) of NOx" (Appx29 (col.19:51-52)) is a material that can catalyze SCR of NO_x, as understood in the art of exhaust systems.

C. The Intrinsic Evidence Establishes That A Skilled Artisan Would Understand The Scope Of The Claims With Reasonable Certainty

1. The '185 patent provides reasonable certainty

A patent's claims, viewed in light of the intrinsic evidence, need only inform skilled artisans of the invention's scope with reasonable certainty. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). Under the correct construction of the material composition limitations, that standard is met here.

JMI complains that the material composition limitations "have no reasonably defined boundary" and are "ambiguous." JMI Br. 26, 31, 42-44. Not so. As BASF explained, the specification clearly identifies the functions that the claimed material compositions must perform, expressly defining those functions and providing exact chemical equations for each reaction. BASF Br. 43. JMI does not suggest there is any ambiguity in the functions or in the chemical reactions defining those functions. Instead, JMI argues that the chemical reactions "do not assist a skilled artisan in determining *which materials* are encompassed within" the limitations. JMI Br. 31 (emphasis by JMI).

But that is just an attack on the well-accepted practice of using functional language generally. The point of using functional language is to define a term "by what it does rather than by what it is." *Swinehart*, 439 F.2d at 212. "By its own literal terms," where a limitation identifies the function to be performed, it inherently defines the scope of the term as any embodiment that can perform the function. *Id.* at 213. Because the SCR and ammonia oxidation catalyst functions are unambiguous, so is the scope of the limitations.

JMI's argument that "BASF could have claimed what the catalyst compositions are, rather than claiming only what they do" (JMI Br. 42) is beside the point. No legal principle restricts the use of functional limitations to only when necessary. Rather, it is well established that "defining a particular claim term by its function is not improper." *Hill-Rom*, 755 F.3d at 1374-75. Moreover, the language in the patent is consistent with what was invented—an architecture in which catalysts are arranged in a particular way, *not* SCR catalysts and ammonia oxidation catalysts themselves. The functional language used in the claims is a straightforward way of apprising skilled artisans that the catalysts in that arrangement may be any SCR catalyst and ammonia oxidation catalyst as understood in the art of exhaust systems.

Confirming that a skilled artisan would understand the scope of the material composition limitations, the specification refers to materials that can perform the

recited functions as "SCR catalysts" and "ammonia oxidation catalysts"—known terms in the art of engine exhaust systems. BASF Br. 43-44. Using known terms with "established, sufficiently objective meaning in the art" to describe materials is enough to provide reasonable certainty. *DDR Holdings v. Hotels.com*, 773 F.3d 1245, 1260-61 (Fed. Cir. 2014); *see Ancora*, 744 F.3d at 737. JMI's description of the invention and the existing art confirms that skilled artisans understood what SCR catalysts and ammonia oxidation catalysts are. JMI Br. 3-6. For example, JMI acknowledges that before the filing date, the use of SCR catalysts was "[a] proven way to lessen NOx emissions," and "others in the industry had commercialized AMOx catalysts" to reduce ammonia slip in engine exhaust systems. JMI Br. 3-4.

As BASF's opening brief also explained, the specification goes even further, reinforcing the claims' clear meaning by providing a general description of SCR catalysts and ammonia oxidation catalysts and listing numerous examples of such catalysts. BASF Br. 44-47; Appx20-23 (col.2:29-39, col.2:52-col.3:1, col.6:47-col.8:56); Appx29 (col.20:6-8, col.20:12-24, col.20:29-41). JMI argues that "the problem is that the specification gives only examples of materials that might work, while the claim language could possibly include other materials that aren't mentioned in the specification." JMI Br. 30. But the specification need not list every embodiment covered by the claims, and JMI cites nothing for such a

requirement. As BASF discussed (at 41-42), the reasonable certainty standard does not require that a skilled artisan be able to list every embodiment. Indeed, even if some experimentation were necessary to determine whether a material falls within the scope of the claims, that would not render the claims indefinite. *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1336 (Fed. Cir. 2010).

Moreover, the examples in the specification provide still more guidance. A non-exhaustive list of examples can provide the necessary particularity and definiteness even for claim terms (unlike those here) that are not precisely defined, such as "substantially," "near," and "visually negligible." *Sonix Tech. Co. v. Publications Int'l, Ltd.*, 844 F.3d 1370, 1376-77 (Fed. Cir. 2017); *Mentor Graphics Corp. v. Eve-USA, Inc.*, --- F.3d ----, 2017 WL 1024502, at *10 (Fed. Cir. Mar. 16, 2017); *Enzo*, 599 F.3d at 1336. Specification examples can "provide[] an objective baseline through which to interpret the claims." *Sonix*, 844 F.3d at 1378. The examples "allow[] a skilled artisan to compare a potentially infringing product 'with the examples in the specification to determine whether'" there is infringement. *Id.* at 1377 (quoting *Enzo*, 599 F.3d at 1336). If that is so with imprecise terms like "substantially," "near," and "visually negligible," it is even more so here, where the term "effective" has a clear ordinary meaning.

2. The specification's disclosure of various conditions in which an exhaust engine may operate does not establish indefiniteness

JMI also argues that the asserted claims are indefinite for a purportedly "separate" reason: that the specification "discloses numerous outcome-determinative methods to measure catalyst function and never specifies which method to use." JMI Br. 45. As an initial matter, this is not a "separate" argument. JMI contends that "[w]hen a patent recites a particular variable, such as the required degree of catalyst function, it must reasonably convey to a person of ordinary skill how to ascertain that variable." JMI Br. 45; *see* Appx5. But the claims here do not "recite[] a particular variable, such as the required degree of catalyst function," *contra* JMI Br. 45; rather, they should be construed as having their "full breadth," *Innova*, 381 F.3d at 1120. Once they are, there is no minimum level of function to measure. BASF Br. 39.

In any event, JMI's argument is wrong. JMI argues that the claims here are indefinite for the same reasons the claims were indefinite in *Teva*, *Dow*, and *Honeywell*. But the '185 patent is nothing like the patents in those cases; indeed, JMI avoids discussing the circumstances of those cases.

In those cases, the claims did recite particular variables, and the measurement method was critical to determining infringement, yet the intrinsic evidence failed to provide any reasonable certainty about which method to use. In

Teva, the patent required "a molecular weight of about 5 to 9 kilodaltons." 789 F.3d at 1338. But there were three ways to measure molecular weight, each yielding a different number; knowing which method to use was thus critical to determining whether the specified range was met. *Id.* In *Dow*, the claim required "a slope of strain hardening coefficient greater than or equal to 1.3." *Dow Chem. Co. v. Nova Chems. Corp. (Canada)*, 803 F.3d 620, 631 (Fed. Cir. 2015). There were four ways of measuring slope, each of which could produce a different result. *Id.* at 633-34. It was therefore critical to know which measurement method to use so that one could determine whether the slope was greater than or equal to 1.3. *Id.* And in *Honeywell*, a representative claim required "a melting point elevation of 2 to 10 C." *Honeywell Int'l, Inc. v. ITC*, 341 F.3d 1332, 1335 (Fed. Cir. 2003). There were four different potential sample preparation methods, and the choice of method was critical in calculating melting point evaluation and thus in determining whether the specified range was met. *Id.* at 1340-41.

Here, by contrast, the claims do not specify any particular range of catalyst function that must be satisfied. So unlike in *Teva*, *Dow*, and *Honeywell*, the claims are not defined by referring to a specific degree to which a particular material can perform a catalyst function. A material is within the scope of a material composition limitation if it can perform the recited function, as understood in the art of exhaust systems.

Additionally, unlike in *Teva*, *Dow*, and *Honeywell*, it is undisputed here that there is only one way to measure catalyst function: "The '185 patent uses a standard called conversion percentage to measure catalyst function." JMI Br. 47. JMI acknowledges that "percent conversion" is a frequently used, objective standard of measuring catalytic function. JMI Br. 12. The supposedly various measurement "methods" to which JMI points are simply different environmental conditions—e.g., temperature—in which a material might be tested to determine percent conversion. JMI Br. 47-48. But variability due to environmental conditions does not render claims indefinite. So long as a skilled artisan can determine whether a material can perform the required function under a given set of environmental conditions, the claims are not indefinite. *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576 (Fed. Cir. 1986); *Enzo*, 599 F.3d at 1335-36.

In any event, the claims provide guidance about the environmental conditions in which to evaluate catalyst function: materials must be effective to catalyze SCR or ammonia oxidation in "[a] catalyst system for treating an exhaust gas stream." Appx29 (col.19:40-41). The specification identifies the relevant field as "catalysts, methods for their manufacture, and methods of treating emissions in an exhaust system." Appx20 (col.1:6-8, 20-23). A person skilled in the art of catalyst systems for treating emissions in an exhaust stream would understand the

operating conditions of such catalyst systems; JMI does not suggest otherwise. *See Source Search Techs., LLC v. LendingTree, LLC*, 588 F.3d 1063, 1076 (Fed. Cir. 2009).

Were there any doubt about the environmental conditions, the specification goes beyond what is required and identifies several possible conditions in which catalyst systems would be expected to operate. JMI Br. 48-49. As JMI states, the specification "discloses at least five sets of exemplary reaction conditions to measure SCR conversion percentage and at least three sets of exemplary reaction conditions to measure AMOx conversion percentage." JMI Br. 48. That the specification provides those examples means that the specification provides *more* certainty to a person of skill in the art, not less.

* * *

Based on the ordinary meaning of "effective" and the disclosures in the intrinsic record, this Court can and should reverse the indefiniteness judgment and need not consider the extrinsic evidence.

II. THE EXTRINSIC EVIDENCE ALSO COMPELS THE CONCLUSION THAT THE CLAIMS ARE NOT INDEFINITE

A. Under the Correct Construction, The Extrinsic Evidence Establishes That The Claims Are Not Indefinite

BASF's opening brief showed that under the correct construction of the material composition limitations, undisputed extrinsic evidence establishes that a

skilled artisan would understand the claimed scope with reasonable certainty. BASF Br. 47-57. In particular, BASF demonstrated that, by the '185 patent's filing date, skilled artisans were familiar with materials that catalyze SCR and ammonia oxidation. BASF Br. 49-53. For example, by 2002 engine manufacturers were using SCR catalysts for mobile applications, such as heavy-duty diesel engines. Appx317; Appx951-952; Appx1319; Appx1322; Appx1372-1387. Ammonia oxidation catalysts also were known to persons of ordinary skill in the art and in use by the filing date. Appx317; Appx953-955; Appx990-1145; Appx1319-1322; Appx1383-1384. JMI does not dispute this.

BASF also explained that the terms "SCR catalyst" and "ammonia oxidation catalyst" had established meanings and were used in the art to refer to materials that catalyze SCR and ammonia oxidation, respectively. BASF Br. 53-55. Claiming a class of materials using broadly known terms with established meanings provides reasonable certainty. *DDR*, 773 F.3d at 1259-60; *Ancora*, 744 F.3d at 737. Far from disputing this, JMI's brief also uses "SCR catalyst" and "ammonia oxidation catalyst" in accordance with their known meanings. *E.g.*, JMI Br. 1 ("The '185 patent uses functional terms to claim two catalysts, an 'AMOx' catalyst and an 'SCR' catalyst."); JMI Br. 5 ("the '185 patent claims a known arrangement of an SCR catalyst and AMOx catalyst" (capitalization altered)).

JMI's only response is that "the claims are not limited to the catalyst materials mentioned in the extrinsic evidence" and that the exemplary catalysts "do[] not tell a skilled artisan all the other materials that may or may not fall within the claims." JMI Br. 34-35. But JMI cites no authority suggesting that extrinsic evidence must list every possible embodiment. That is not the law. *See DDR*, 773 F.3d at 1259-60. Rather, because the extrinsic evidence shows that skilled artisans were familiar with exemplary claimed materials and used the same words as the patent to describe them, the claims are not indefinite. *Id.*

B. JMI Cannot Use Extrinsic Evidence To Vary The Clear Meaning Of The Claim Language

JMI relies on extrinsic evidence only for its claim construction arguments. JMI points to expert and inventor testimony to argue that a skilled artisan would read the material composition limitations as requiring some minimum level of catalyst functionality. JMI Br. 32-34. But extrinsic evidence cannot "alter the scope of the claims." *Vitronics*, 90 F.3d at 1583. Where a patent uses a claim term according to its ordinary meaning, or where intrinsic evidence alone resolves any ambiguity, relying on extrinsic evidence is improper. *Id.* at 1582-83; *Wi-Lan, Inc. v. Apple Inc.*, 811 F.3d 455, 462 (Fed. Cir. 2016).

Nevertheless, JMI points to testimony from Dr. Buzby, an inventor, as evidence of claim scope. JMI Br. 32-33. "The testimony of an inventor 'cannot be relied on to change the meaning of the claims.'" *Howmedica Osteonics Corp. v.*

Wright Med. Tech., Inc., 540 F.3d 1337, 1346 (Fed. Cir. 2008) (citation omitted). In any event, Dr. Buzby testified consistently with the ordinary meaning of "effective." Recognizing that "under certain conditions a copper SCR catalyst can also catalyze the oxidation of ammonia," Dr. Buzby agreed that under those conditions "a copper-based SCR catalyst is a material that's effective for catalyzing ammonia oxidation." Appx851 (196:19-197:8).

JMI also relies (at 33-34) on its expert, Dr. Epling, who stated that scientists and engineers "do not consider materials that display only a minimal level of SCR or ammonia oxidation function to be a material effective to reduce NOx or to oxidize ammonia." Appx1410. But that proves BASF's point—it shows that persons skilled in the art of exhaust systems understand what materials are and are not effective to perform the recited catalyst functions. In any event, his testimony cannot overcome the ordinary meaning of "effective" because where, as here, "the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled to no weight." *Vitronics*, 90 F.3d at 1584. Dr. Epling also opined that BASF's construction would give the material composition limitations a broad scope. JMI Br. 33-34. But as JMI acknowledges, "breadth is not indefiniteness." *SmithKline*, 403 F.3d at 1341 (brackets omitted).

CONCLUSION

The indefiniteness judgment should be reversed and the case remanded for infringement proceedings. At a minimum, the invalidity judgment should be vacated and the case remanded for determination of whether, under the correct construction, JMI can prove by clear and convincing evidence that a skilled artisan would not be able to ascertain the claims' scope with reasonable certainty.

Respectfully submitted,

Dated: March 23, 2017

/s/ Deanne E. Maynard

DEANNE E. MAYNARD
DANIEL P. MUINO
MARC A. HEARRON
SETH W. LLOYD
MORRISON & FOERSTER LLP
2000 Pennsylvania Avenue, N.W.
Washington, D.C. 20006
Telephone: 202.887.8740
DMaynard@mofo.com

Counsel for Plaintiff-Appellant
BASF Corporation

RACHEL KREVANS
MORRISON & FOERSTER LLP
425 Market Street
San Francisco, CA 94105

CERTIFICATE OF SERVICE

I hereby certify that I electronically filed the foregoing with the Clerk of the Court for the United States Court of Appeals for the Federal Circuit by using the appellate CM/ECF system on March 23, 2017.

I certify that all participants in the case are registered CM/ECF users and that service will be accomplished by the appellate CM/ECF system.

Dated: March 23, 2017 /s/ Deanne E. Maynard

CERTIFICATE OF COMPLIANCE WITH RULE 32(a)

This brief complies with the type-volume limitation of Rule 32(a) of the Federal Rules of Appellate Procedure because it contains 6,998 words.

Dated: March 23, 2017 /s/ Deanne E. Maynard

dc-873456