IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

S.O.I.TEC SILICON ON INSULATOR TECHNOLOGIES, S.A. and COMMISSERIAT À L'ÉNERGIE ATOMIQUE,	)	
Plaintiffs,	)	
v.	)	Civ. No. 08-292-SLR
MEMC ELECTRONIC MATERIALS, INC.,	)	
Defendant.	)	

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MEMORANDUM OPINION

Dated: July 13, 2011
Wilmington, Delaware

ROBINSON, District Judge

I. INTRODUCTION

Plaintiffs S.O.I.TEC Silicon On Insulator Technologies, S.A. ("Soitec") and Commissariat à L'Énergie Atomique ("CEA") (collectively, "plaintiffs") filed their complaint against MEMC Electronic Materials Inc. ("MEMC" or "defendant") on May 19, 2008, alleging infringement of U.S. Patents No. RE 39,484 ("the Bruel patent"), as well as U.S. Patent Nos. 6,809,009 ("the '009 patent") and 7,067,396 ("the '396 patent"). (D.I. 1) In lieu of an answer, defendant moved to dismiss the complaint, which motion was denied by the court on February 20, 2009. (D.I. 16) Defendant thereafter answered and brought, *inter alia*, counterclaims for infringement of U.S. Patent No. 5,834,812 ("the '812 patent"), as well as for a declaration of noninfringement of several unasserted patents. (D.I. 19) Plaintiffs moved to dismiss defendant's counterclaims relating to the unasserted patents but, subsequently, withdrew the motion. (D.I. 30, 48) Plaintiffs filed an amended complaint on July 21, 2009 adding a claim for infringement of U.S. Patent No. 7,498,234 ("the '234 patent"). (D.I. 57) The court granted defendant's subsequent motion to bifurcate the issues of willfulness and damages for purposes of discovery and trial (D.I. 77), and denied plaintiffs' cross-motion to bifurcate the issues of intervening rights and inequitable conduct (D.I. 85).

Following extensive briefing on summary judgment motions, the court: (1) granted MEMC's motion for summary judgment of noninfringement with respect to the Bruel patent; (2) granted Soitec's motion that the Bruel patent complies with the written description requirement; (3) granted MEMC's motion for summary judgment of noninfringement with respect to the '009, '396 and '234 patents (collectively, the "Aspar

patents"); (4) granted MEMC's motion for partial summary judgment of invalidity of the asserted Aspar patent claims with respect to the '234 and '396 patents; (5) denied MEMC's motion for partial summary judgment of invalidity with respect to the '009 patent; (6) denied Soitec's motion for partial summary judgment that the certificate of correction for the '396 patent is valid; (7) granted Soitec's motion for partial summary judgment that the Bruel patent does not anticipate the Aspar patents; (8) granted Soitec's motion for partial summary judgment that the Aspar patents satisfy the written description requirement; (9) granted Soitec's motion for partial summary judgment that the Aspar patents satisfy the best mode requirement; (10) denied Soitec's motion for partial summary judgment that the Aspar patents are not invalid for inequitable conduct; (11) denied Soitec's motion for partial summary judgment of invalidity of the '812 patent for lack of enablement; (12) denied Soitec's motion for partial summary judgment of invalidity of the '812 patent in view of prior art; and (13) granted Soitec's motion for summary judgment of noninfringement of the '812 patent with respect to claim 10. (D.I. 325) A jury trial commenced on October 25, 2010. The jury found that Soitec's bonded silicon-on-insulator ("BSOI") wafers infringe claim 1 of the '812 patent, which is valid. (D.I. 343) The jury also found that MEMC did not prove the invalidity of the '009 patent by clear and convincing evidence. (*Id.*) Judgment was entered accordingly. (D.I. 348)

Currently before the court are seven post-trial motions. Soitec moves the court for the following relief: (1) reconsideration of its request to modify the protective order to allow Soitec to use information learned in the present litigation to support the filing of collateral litigation (D.I. 301); (2) leave to file a reply brief in support of the motion above

(D.I. 351); (3) judgment as a matter of law ("JMOL") that the '812 patent is invalid (D.I. 361); (4) injunctive relief and a lift of the stay on damages discovery (D.I. 363); and (5) that the court strike MEMC's reply brief in support of its JMOL motion (D.I. 390). MEMC moves the court for: (1) reargument on the court's order that it was not permitted to proceed with a bench trial on inequitable conduct vis a vis the '009 patent (D.I. 350); and (2) JMOL that claim 4 of the '009 patent is invalid (D.I. 359). The court has jurisdiction over these matters pursuant to 28 U.S.C. § 1338.

II. BACKGROUND

A. The Parties

Soitec is a French company and a leading developer of silicon-on-insulator semiconductor ("SOI") wafers. CEA is the French Atomic Energy Commission, which operates a research facility known as the Laboratory of Electronics and Information Technologies in Grenoble, France. CEA is the owner of the '484 and Aspar patents, which are exclusively licensed to Soitec.[1] MEMC is a Delaware corporation having a principal place of business in St. Peters, Missouri, and is also in the SOI business.

B. Technology Overview

Semiconductor films, also referred to as wafers, are a thin slice of semiconductor material, such as silicon crystal, used in the manufacture of microelectronic devices. Semiconductor wafers are made of nearly defect-free single crystalline material. Single-crystal silicon has been haled as one of the most important technological materials of the last decades.

[1]For ease of reference, the court referrs to "Soitec" synonymously with "plaintiffs" and as the owner of the Bruel and Aspar patents throughout its opinion.

SOI wafers contain three layers: a top, "active" layer of high-quality silicon (the "wafer"); a buried layer of electrically-insulating silicon dioxide (the "BOX" layer);[2] and a silicon support layer (also called the "handle" or "handle wafer"). That is, two silicon wafer layers surround the BOX layer. The BOX layer is an electrical insulator; it keeps electrons flowing efficiently without letting stray electrons leak into the silicon substrate. As a result, junction capacitance (the electric charge temporarily stored where the regions meet) is reduced, electrons get to their destinations faster and device performance is increased.[3] SOI wafers may perform with 30-40% less power input (with less error rate) than their bulk-silicon predecessors.[4]

C. Soitec's '009 Patent

The court previously discussed in detail the disclosure of the '009 patent as well as the prosecution history of the Aspar patent family in its prior opinion, and assumes familiarity with its prior discussion. *See S.O.I.Tec Silicon on Insulator Tech's, S.A. v. MEMC Electronic Materials, Inc.*, 745 F. Supp. 2d 489, (D.Del. 2010). Generally, the '009 patent specification describes a method for forming thin-layer SOI films that is an improvement over U.S. Patent No. 5,374,564 ("the '564 patent"), which was later reissued as the Bruel patent. The process described in the '009 patent comprises: (1) a first ion bombardment phase sufficient to create microcavities, occurring at a temperature below 350° C (col. 4:47-49); (2) an intermediate thermal treatment step occurring at a temperature sufficient to allow coalescence of the microcavities along the

[2] Shorthand for "buried oxide."
[3] *See, gen.,* http://www.soiconsortium.org/pdf/SOI_Implementation_WhitePaper_Infotech_v2.pdf.
[4] *See, gen.,* http://www.soiconsortium.org/pdf/Consortium_9april09_final.pdf.

reference plane (col. 3:41-56; col. 5:15; fig. 2); and (3) separating the wafer into two parts by "the application of two mechanical forces between the two parts of the wafer" (col. 3:5-8; col. 3:34-35; col. 5:51-55; fig. 4). The intermediate thermal step results in partial separation allowing for the possible incorporation of electronics. (Col. 2:41-43; col. 3:41-45; fig. 3) A stiffner (or "support") may also optionally be provided on the wafer following this intermediate thermal step. (Col. 3:41-56) Because only partial separation is achieved at this stage, the separation requires the extra step of applying mechanical forces. (Col. 5:51-55; fig. 4)

Dependant claim 4 of the '009 patent was at issue at trial. Claim 1 of the '009 patent discloses the following:

> 1. A method for producing a thin film comprising:
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> providing a first substrate having a face surface;
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> introducing hydrogen ions into the first substrate at the face surface, such that microcavities are formed in the first substrate during or after introducing the ions, wherein the microcavities define a thin film layer extending from the first surface to the microcavities, the microcavities reside between solid bridges of the first substrate, and the hydrogen ions are introduced into the first substrate at a temperature and at a total amount so as not to fracture the solid bridges during energizing of the first substrate;
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> bonding a second substrate to the face surface of the first substrate; and
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> applying mechanical forces to fracture the solid bridges.

Claim 4 (asserted by Soitec against MEMC) depends from claim 2 (further depending from claim 1) and additionally requires applying energy to the first substrate after introducing hydrogen ions. As noted above, the jury found that MEMC did not meet its

burden to prove, by clear and convincing evidence, that claim 4 of the '009 patent was invalid.

D. MEMC's '812 Patent

Claim 1 of the '812 patent was at issue at trial. The court has discussed in detail the disclosure of the '812 patent as well as its prosecution history in its prior opinion, and again assumes familiarity therewith. *See S.O.I.Tec Silicon on Insulator Tech's,* 745 F. Supp. 2d at 523-26 (D.Del. 2010). Generally, the '812 patent describes a method for stripping the outer edges of bond and etch back SOI ("BESOI") wafers. The specification explains that, when BESOI wafers are bonded, the edges of the wafers fail to uniformly bond and "the device layer of BESOI wafers often have edge margins of approximately 2-10 mm which exhibit voids, bubbles and other delaminations [which] detract from the desirability of the BESOI wafers." (Col. 1:41-46) It is the object of the '812 patent to provide a method for removing these edge margins without damaging the device layer. The claims of the '812 patent are not drawn to the method, but to the edge-free wafers resultant from the described process, as exemplified by claim 1:

> 1. An SOI wafer comprising
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> a handle wafer,
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> an oxide layer on at least one surface of the handle wafer, and
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> a device layer having an exposed surface, a bonded surface parallel to and opposite the exposed surface and having a periphery, and a mean thickness of between approximately 500 angstroms and approximately 50 microns with a thickness variance of less than approximately 10% of the mean thickness, the bonded surface being bonded generally in its entirety to the oxide layer,
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> the device layer being radially contained within the periphery of the bonded surface.

III. STANDARDS

A. Motion for Judgment as a Matter of Law

To prevail on a renewed motion for judgment as a matter of law following a jury trial under Federal Rule of Civil Procedure 50(b), the moving party "'must show that the jury's findings, presumed or express, are not supported by substantial evidence or, if they were, that the legal conclusions implied [by] the jury's verdict cannot in law be supported by those findings.'" *Pannu v. Iolab Corp.*, 155 F.3d 1344, 1348 (Fed. Cir. 1998) (quoting *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893 (Fed. Cir. 1984)). "'Substantial' evidence is such relevant evidence from the record taken as a whole as might be acceptable by a reasonable mind as adequate to support the finding under review." *Perkin-Elmer Corp.*, 732 F.2d at 893. In assessing the sufficiency of the evidence, the court must give the non-moving party, "as [the] verdict winner, the benefit of all logical inferences that could be drawn from the evidence presented, resolve all conflicts in the evidence in his favor, and in general, view the record in the light most favorable to him." *Williamson v. Consol. Rail Corp.*, 926 F.2d 1344, 1348 (3d Cir. 1991); *Perkin-Elmer Corp.*, 732 F.2d at 893. The court may not determine the credibility of the witnesses nor "substitute its choice for that of the jury between conflicting elements of the evidence." *Id*. In summary, the court must determine whether the evidence reasonably supports the jury's verdict. *See Dawn Equip. Co. v. Kentucky Farms Inc.,* 140 F.3d 1009, 1014 (Fed. Cir. 1998).

B. Motion for a New Trial

The decision to grant or deny a new trial is within the sound discretion of the trial court and, unlike the standard for determining judgment as a matter of law, the court need not view the evidence in the light most favorable to the verdict winner. *See Allied Chem. Corp. v. Darflon, Inc.*, 449 U.S. 33, 36 (1980). Federal Rule of Civil Procedure 59(a) provides, in pertinent part:

> A new trial may be granted to all or any of the parties and on all or part of the issues in an action in which there has been a trial by jury, for any of the reasons for which new trials have heretofore been granted in actions at law in the courts of the United States.

New trials are commonly granted in the following situations: (1) where the jury's verdict is against the clear weight of the evidence, and a new trial must be granted to prevent a miscarriage of justice; (2) where newly-discovered evidence surfaces that would likely alter the outcome of the trial; (3) where improper conduct by an attorney or the court unfairly influenced the verdict; or (4) where the jury's verdict was facially inconsistent. *See Zarow-Smith v. N.J. Transit Rail Operations*, 953 F. Supp. 581, 584 (D.N.J. 1997) (citations omitted). The court, however, must proceed cautiously and not substitute its own judgment of the facts and assessment of the witnesses' credibility for the jury's independent evaluation. Nevertheless,

> [w]here a trial is long and complicated and deals with a subject matter not lying within the ordinary knowledge of jurors a verdict should be scrutinized more closely by the trial judge than is necessary where the litigation deals with material which is familiar and simple, the evidence relating to ordinary commercial practices. An example of subject matter unfamiliar to a layman would be a case requiring a jury to pass upon the nature of an alleged newly discovered organic compound in an infringement action.

Lind v. Schenley Indus. Inc., 278 F.2d 79, 90-91 (3d Cir. 1960).

C. Motions for Reargument and Reconsideration

The purpose of a motion for reargument or reconsideration is to correct manifest errors of law or fact or to present newly discovered evidence. *Max's Seafood Café ex rel. Lou-Ann, Inc. v. Quinteros*, 176 F.3d 669, 677 (3d Cir. 1999). Accordingly, a court should alter or amend its judgment only if the movant demonstrates at least one of the following: (1) a change in the controlling law; (2) availability of new evidence not available when the court issued its order; or (3) a need to correct a clear error of law or fact or to prevent manifest injustice. *See id*.; *see also, Schering Corp. v. Amgen, Inc*., 25 F. Supp. 2d 293, 295 (D.Del. 1998).

A motion for reargument is not properly premised on a request that a court rethink a decision already made. *Glendon Energy Co. v. Borough of Glendon*, 836 F. Supp. 1109, 1122 (E.D. Pa. 1993). Motions for reargument may not be used "to argue new facts or issues that inexcusably were not presented to the court in the matter previously decided." *Brambles USA, Inc., v. Blocker*, 735 F. Supp. 1239, 1240 (D.Del. 1990). Reargument, however, may be appropriate where "the court has patently misunderstood a party, or has made a decision outside the adversarial issues presented to the court by the parties, or has made an error not of reasoning but of apprehension." *Id.* at 1241.

IV. DISCUSSION

A. MEMC's Motion for Reargument on Inequitable Conduct

The court begins its discussion with MEMC's motion for reargument regarding inequitable conduct, as the facts underlying this claim are relevant to the disposition of subsequent issues. The background of the dispute is as follows. MEMC raised in 2009 a counterclaim that the '009 patent is unenforceable for inequitable conduct. (D.I. 60) In July 2010, Soitec filed a motion for summary judgment against MEMC's inequitable conduct counterclaim. MEMC opposed Soitec's motion, but filed no cross motion. The court ultimately denied Soitec's motion on the ground that genuine issues of material fact precluded summary judgment. In its detailed opinion, with which the court presumes familiarity, the court noted that the information allegedly withheld from the PTO would have been reasonably considered important to the examiner of the '009 patent, and that MEMC adduced facts from which an intent to deceive could be inferred. *S.O.I.Tec Silicon Insulator Techs., S.A.*, 745 F. Supp. 2d at 521-522. The court made no dispositive factual findings, however, noting that a bench trial was preferable to develop the record and to allow for an opportunity to brief the issue post-trial under the most current Federal Circuit law.[5] *Id.* at 522.

MEMC was scheduled to present its inequitable conduct case to the court following the jury trial. MEMC's theory of inequitable conduct patent was one of "infectious" unenforceability – that is, the inequitable conduct allegedly occurred during

[5] At that time, the Federal Circuit's (en banc) review of the law relating to inequitable conduct was imminent. *Therasense, Inc. v. Becton, Dickinson & Co.*, Civ. Nos. 2008–1511, –1512, –1513, –1514, –1595. *See 374 Fed. Appx.* 35 (Fed. Cir. 2010).

prosecution of U.S. Patent No. 6,225,192, the parent from which the application issuing as the '009 patent was filed. (D.I. 371 at 949-50, 958) MEMC did not subpoena any witnesses to call at the bench trial; it claims that its only witnesses, the two attorneys responsible for prosecuting the '009 patent, were adverse and outside of the court's subpoena power. (D.I. 350 at 6) MEMC sought to proceed, therefore, by tendering a box of exhibits and an exhibit list to the court – "essentially the same record as [its] opposition to [ ] summary judgment." (D.I. 371 at 961-62) MEMC argued that the court's holding on summary judgment was that MEMC had adduced facts from which an intent to deceive could be inferred (*id.* at 966), and argues post-trial that the law of the case doctrine dictates that the court's summary judgment holding should not have been disturbed. (D.I. 350 at 10)

On review, MEMC does not meet the standard for reconsideration of the court's decision. First, MEMC's law of the case argument is misplaced, as the court's finding the existence of a genuine issue of material fact on intent is not akin to the court's ruling in MEMC's favor on that issue. Secondly, the court did not mistakenly believe, as MEMC contends, that MEMC waived its right to a trial on inequitable conduct by declining to move for summary judgment. Rather, the court was prepared to go forward with trial, but determined that judgment should be entered in favor of Soitec because MEMC could not move the entry of any evidence absent the aid of witnesses. (D.I. 371 at 970-71) The court's civil trial guidelines have long provided that "[d]ocuments shall not be admitted except through the testimony of a witness" and that, "[u]nless otherwise permitted upon application by the parties, deposition excerpts must be read into the

record (or, in the case of [electronically recorded] depositions, played for purposes of the record)[.]" MEMC did not request permission to move deposition excerpts (without reading them) into the record; it sought only to resubmit its summary judgment record. (D.I. 371 at 961-62) That Soitec had brought its two prosecuting attorneys to trial (to possibly testify in Soitec's defense) was a fortuitous circumstance, as was the fact that Soitec had no particular objections to MEMC's proffered deposition designations. Ultimately, however, these facts do not alleviate MEMC's burdens in either regard.[6]

The court notes that MEMC now suggests that it was prepared to play electronically recorded depositions "[h]ad the court preferred." (D.I. 350 at 7) It also suggests, without providing further detail, that **all** of its documentary evidence in support of its inequitable conduct claim was discussed during the previous depositions of Soitec's counsel. (*Id.*) These suggestions were not previously made to (and rejected by) the court. As the court observed, MEMC did not seek to participate in a live trial, rather, it simply sought judgment on its proffered box of documents. The court discerns no error in its prior ruling, and MEMC's motion is denied.[7]

[6] MEMC is correct that it was its prerogative not to move for summary judgment, however, having so elected, MEMC was subject to both the court's trial guidelines as well as the Federal Rules of Evidence. MEMC had an opportunity to raise any questions or concerns with respect to the court's guidelines (or its inequitable conduct case) at the pretrial conference; there is no indication that this occurred.

[7] The Federal Circuit has since raised the bar for proving inequitable conduct such that evidence of a "deliberate decision" to deceive the PTO is required. *See Therasense, Inc. v. Becton, Dickinson & Co.*, --- F.3d ---, 2011 WL 2028255, *9 (Fed. Cir. May 25, 2011). Insofar as there is no clear indication from the summary judgment record that MEMC's documents evidenced a "deliberate decision" to deceive the PTO, this heightened burden buttresses the court's determination that no error was made.

B. Soitec's Motion for Reconsideration Regarding the Protective Order

Soitec requests reconsideration of the court's denial of its September 16, 2010 e-mail request for emergency relief to modify the protective order. Soitec utilized the court's e-mail request mechanism to request that it be permitted to utilize discovery in this litigation (designated by MEMC as "Protected Information" pursuant to paragraphs 9, 10, 11 and 15 of the protective order) to file collateral patent infringement litigation. Following an e-mail response by MEMC, as per the court's procedure, the court declined Soitec's request. Soitec now argues that the court made an "error of apprehension because Soitec was unable to present to the court facts and law necessary to allow [it] to properly apprehend the nature of its request due to the limitation on argument regarding request[s] for emergency relief[.]" (D.I. 301 at 7)

Soitec's motion is less than compelling. Soitec states that it sought relief under the court's emergency e-mail procedure in order to expedite the issue due to the upcoming trial and to more quickly file its new infringement claims. (D.I. 301 at 7, n.1) Having so elected, Soitec cannot now complain that it was denied the opportunity for further argument.[8] Soitec's motion does not raise any "new facts or issues that inexcusably were not presented to the court" sooner and, therefore, its motion is denied. *See Brambles, USA*, 735 F. Supp. at 1240.

[8]Soitec was aware that the court's e-mail procedure does not allow for a reply email on the issue raised when it elected to utilize that procedure. Further, while the court normally does not entertain discovery motions in patent cases (in favor of a discussion of the issues at discovery conferences), Soitec might have raised the issue for discussion, at which time the court would have entertained a request for briefing.

C. Soitec's Motion for JMOL or, in the Alternative, a New Trial

Soitec asserted at trial that claim 1 of MEMC's '812 patent is invalid as: (1) anticipated by the Bruel patent; and (2) obvious in view of the Bruel patent, U.S. Patent No. 5,152,857 ("the Ito patent"), U.S. Patent No. 4,601,779 ("the Abernathy patent"); U.S. Patent No. 5,240,883 ("the Abe patent"); and/or Table 1 of a publication entitled "Silicon-on-Insulator by Wafer Bonding: A Review" by W.P. Maszara (hereinafter, "Maszara" and "the Maszara Table"[9]). (D.I. 343) Soitec now asks the court to review the jury's verdict that the '812 patent is valid. This case presents an unusual set of circumstances in this regard: following Soitec's presentation, MEMC rested its case on the cross-examinations of Soitec's witnesses, and did not present a validity expert in rebuttal to Soitec's invalidity case. Prior to addressing the merits, however, the court must first consider MEMC's argument that Soitec's motion is time-barred.

1. Timeliness of motion

Judgment following the jury verdict was entered on November 15, 2010. (D.I. 348) The parties agree that, pursuant to Federal Rules of Civil Procedure 50(b) and 59(b), the deadline for filing such motions was December 13, 2010. MEMC filed its motion for JMOL on this date. Also on December 13, the parties docketed a joint stipulation and proposed order extending the deadline to file motions and post-trial briefs to December 14, 2010. (D.I. 358) Soitec filed its motion and papers on December 14, and the court "so ordered" the stipulation the following day on December 15, 2010.

[9] Published at *J. Electrochem. Soc.*, Vol. 138, No. 1 (Jan. 1991).

MEMC now argues that the 28-day deadline imposed by Rules 50(b) and 59(b) is not subject to extension by the court in the first instance under Rule 6(b)(2), which reads:

> Exceptions. A court must not extend the time to act under Rules 50(b) and (d), 52(b), 59(b), (d), and (e), and 60(b).

Fed. R. Civ. P. 6(b)(2).

Soitec does not argue to the contrary, but suggests that the time to file motions under Rules 50(b) and 59(b) did not begin to toll on November 15, 2010. In this regard, Soitec's argument appears to be that the judgment entered on November 15, 2010, specifically styled under Federal Rule of Civil Procedure 58(b) (D.I. 348), was ineffective to trigger the time periods for motions under Rules 50 and 59 because the court had not yet entered judgment on Soitec's inequitable conduct claim or ruled on its request for injunctive relief. (D.I. 387 at 1-2) This argument lacks merit for several reasons: (1) Soitec's stipulation with MEMC evidences an understanding that December 13, 2010 was the post-trial motions deadline, undermining its position here; (2) Soitec's motion for reargument on inequitable conduct was filed on November 16, 2010, prolonging the court's ability to enter judgment;[10] (3) inequitable conduct is not the subject of the belatedly-filed JMOL/new trial motion at issue here; and (4) Soitec's motion for injunctive relief (vis a vis claim 4 of the '009 patent, which the jury held valid) was not filed until December 14, 2010.

[10] While the court noted from the bench that judgment on inequitable conduct would be entered in due course, the court did not enter judgment on the claim prior to November 16, 2010, on which date Soitec filed its motion for reargument.

Soitec also argues that MEMC waived its objection to the untimeliness of its motion by stipulating to the extension of time. The court views waiver as a non-issue. The threshold inquiry presented here is whether the court had the authority to "so order" the stipulation in the first instance. Pursuant to Rule 6(b)(2), it did not. Having so determined, the next relevant inquiry is whether any exceptions apply that may warrant the court's consideration of Soitec's motion on the merits.

The "unique circumstances" doctrine has been applied by courts in certain unique situations, as its name implies, to contravene the effects of untimely filings. In 2007, the Supreme Court determined that the unique circumstances exception cannot excuse an untimely filing of a notice of appeal. *See Bowles v. Russell*, 551 U.S. 205 (2007). The distinction drawn by the Supreme Court is one of jurisdictional versus non-jurisdictional (or "claims-processing") rules: compliance with the former cannot be waived, while compliance with the latter may be waived where the equities permit. *See Henderson v. Shinseki*, --- U.S. ---, 131 S.Ct. 1197 (2011) (holding that the 120-day filing deadline to the Veterans Court is not jurisdictional and *Bowles* did not apply to preclude a belatedly-filed appeal as time-barred).

The court is not presented with a jurisdictional rule here, such as would be implicated in an appeal from one court to another. Rules 50(b) and 59(e) are non-jurisdictional claims processing rules, which fall outside of the mandate of *Bowles*. *See Lizardo*, 619 F.3d at 277-78 (citing *Dill v. General American Life Insurance Co.,* 525 F.3d 612, 618 (8th Cir. 2008) (collecting cases)) (additional citations omitted). Thus, the court will apply the unique circumstances rule and review the merits of the jury verdict –

a matter over which it retains jurisdiction.[11] The court notes in these regards that: (1) there was no miscalculation involved;[12] (2) it is apparent that Soitec relied on the parties' agreement in filing its motion on December 14, 2010; and (3) there is no indication that either party knew the one-day extension was inappropriate when requested.

2. Anticipation

a. Standards

The standard of proof to establish the invalidity of a patent is "clear and convincing evidence." *Microsoft Corp. v. i4i Ltd. Partnership*, ---S.Ct.---, 2011 WL 2224428, *3 (June 9, 2011). Notwithstanding, "new evidence supporting an invalidity defense [not submitted to the PTO during prosecution] may carry more weight in an infringement action than evidence previously considered by the PTO." *Microsoft*, 2011 WL 2224428 at *10 (citation and internal quotation omitted). In such circumstances, the PTO's "considered judgment may lose significant force" and "the challenger's burden to

[11] In a case involving very similar circumstances to those at bar, the Eighth Circuit recently declined to apply the unique circumstances doctrine and assume jurisdiction over the appeal. *See Dill v. General American Life Insurance Co.,* 525 F.3d 612, 615, 620 (8th Cir. 2008). The Federal Circuit, in following *Bowles*, appears unwilling to apply the unique circumstances doctrine to waive an untimely appeal. *See Intern'l Rectifier Corp. v. IXYS Corp.,* 515 F.3d 1353, 1357 (Fed. Cir. 2008); *Marandola v. U.S.*, 518 F.3d 913, 914 (Fed. Cir. 2008) (applying *Bowles* to the Rules of the Court of Federal Claims for appealing decisions to the Federal Circuit). Notwithstanding, the determination of whether the Federal Circuit is conferred jurisdiction over Soitec's appeal is ultimately a matter for that Court's consideration. The court is not aware of authority preventing it from reviewing the merits of the verdict at this stage, regardless of Soitec's appellate rights.

[12] *Compare Kraus v. Consolidated Rail Corp.*, 899 F.2d 1360, 1365-66 (3d Cir. 1990).

persuade the jury of its invalidity defense by clear and convincing evidence may be easier to sustain." *Id.*

An anticipation inquiry involves two steps. First, the court must construe the claims of the patent in suit as a matter of law. *See Key Pharms. v. Hercon Labs. Corp.*, 161 F.3d 709, 714 (Fed. Cir. 1998). Second, the finder of fact must compare the construed claims against the prior art. *See id.*

Proving a patent invalid by anticipation "requires that the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation." *Advanced Display Sys. Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000) (citations omitted). The Federal Circuit has stated that "[t]here must be no difference between the claimed invention and the referenced disclosure, as viewed by a person of ordinary skill in the field of the invention." *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991). The elements of the prior art must be arranged or combined in the same manner as in the claim at issue, but the reference need not satisfy an *ipsissimis verbis* test. *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) (citations omitted). "In determining whether a patented invention is [explicitly] anticipated, the claims are read in the context of the patent specification in which they arise and in which the invention is described." *Glaverbel Societe Anonyme v. Northlake Mktg. & Supply, Inc.*, 45 F.3d 1550, 1554 (Fed. Cir. 1995). The prosecution history and the prior art may be consulted "[i]f needed

to impart clarity or avoid ambiguity" in ascertaining whether the invention is novel or was previously known in the art. *Id*. (internal citations omitted).

b. Discussion

Consistent with MEMC's post-trial papers, the court focuses on the thickness uniformity and the device layer edge profile limitations of claim 1 of the '812 patent. As noted previously, the '812 patent claims a SOI wafer having, *inter alia*, a device layer having a "mean thickness of between approximately 500 angstroms and approximately 50 microns with a thickness variance of less than approximately 10% of the mean thickness." Claim 1 also requires the device layer to be "radially contained within the periphery of the bonded surface."

In support of its obviousness position, Soitec relies on the trial testimony of its expert, Dr. John Bravman ("Bravman"). Bravman first described the 10% thickness limitation as follows:

> That means the variability and the thickness across the wafer can't be more than ten percent of whatever thickness the layer itself happens to be. So if it's a very thin layer of 500 angstroms, that's an extraordinarily tight constraint. That's five angstroms. Two atoms. If it's 50 microns, 10 percent is five microns, which is easier to effect.

(D.I. 368 at 586:6-13) Bravman proceeded to testify that figure 1 of the '564 patent shows a tight distribution of ions following implantation. Put another way, the '564 patent inherently discloses less than 10% thickness variance because the '564 process is a "highly perfected technique" that leads to "a tightly controlled process." (D.I. 362 at 5 (citing D.I. 368 at 590:19-592:12)) Bravman offered this testimony in response to questioning about a wafer having an implantation depth of 13.5 microns, whereupon

Bravman identified the 10% variability as being 1.35 microns or less. (D.I. 368 at 591:19-22) The 13.5 micron depth was not arbitrarily chosen for Soitec's hypothetical; it is provided in a table of results appearing in the '564 patent specification, reproduced below.

Energy of H^+ ions in keV	10	50	100	150	200	500	1000
Thickness of the film in μm	0.1	0.5	0.9	1.2	1.6	4.7	13.5

(JTX-85 at col. 5:50-55)

Bravman did not discuss the smaller thicknesses (or implantation energies) listed in the above table. Later, in the context of defending the validity of Soitec's '009 patent, Bravman offered the following explanation for why, in his opinion, "popping open" (or mechanically cleaving) bonded wafers is very difficult: "The difficulty, of course, comes in getting it uniform across the whole wafer and doing it with repeatability, with percent variations in thickness we've been discussing." (*Id.* at 615:11-18)

With respect to the "radially contained within the periphery of the bonded surface" limitation, Bravman testified as follows:

> Q. In the Bruel process, is it possible for the device layer to transfer from the donor wafer to the handle wafer if it is not bonded to the handle wafer?
>
> A. I don't see how. So I think that limitation is also met.
>
> Q. So it's a physical impossibility, that Bruel would not meet that limitation?
>
> A. I don't see how you could do that, no.

(D.I. 362 at 5 (citing D.I. 368 at 592:23-593:8)) MEMC argues that "I don't see how" is too equivocal to meet the clear and convincing standard of proof, especially considering

Bravman's admission on cross-examination that he has no personal experience cleaving implanted wafers. (D.I. 368 at 628:15-17)

While MEMC elected not to present a rebuttal case on the validity of the '812 patent, Soitec was not relieved of its clear and convincing burden of proof. Soitec's anticipation theory was one of inherent anticipation. To prove anticipation by inherent disclosure, Soitec was required to prove that a person of ordinary skill in the art would have understood that the less than 10% thickness variability limitation was disclosed in the '564 patent. *See Continental Can Co. USA Inc. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991) (explaining that an inherent limitation is one that is "necessarily present" and not one that may be established by "probabilities or possibilities").

Bravman did not frame his testimony in terms of what is "always" or "necessarily" achieved by the '564 process. Soitec does not explain why Bravman focused on the values contained in only one column of '564 patent table 1. On this record, a reasonable jury could have found that at least the 10% thickness variance limitation of claim 1 of the '812 patent was not inherently disclosed in the '564 patent, either because Bravman's testimony was self-contradictory, or because Bravman did not speak to the other table values (i.e., confusion existed as to whether the less than 10% thickness variance limitation "necessarily" resulted from the '564 process).[13] The court declines to disturb the jury's determination that Soitec did not meet its clear and convincing burden of proof in these regards.

3. Obviousness

[13] The court notes that the jury was given an instruction on inherent anticipation echoing the relevant teaching of *Continental Can*. (D.I. 340 at 26-27)

a. Standards

"A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a). Obviousness is a question of law, which depends on several underlying factual inquiries.

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966)).

"[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR*, 550 U.S. at 418. Likewise, a defendant asserting obviousness in view of a combination of references has the burden to show that a person of ordinary skill in the relevant field had a reason to combine the elements in the manner claimed. *Id*. at 418-19. The Supreme Court has emphasized the need for courts to value "common sense" over "rigid preventative rules" in determining whether a motivation to combine existed. *Id*. at 419-20. "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id*. at 420. In addition to showing that a person of ordinary skill

in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, a defendant must also demonstrate that "such a person would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc*., 491 F.3d 1342, 1360 (Fed. Cir. 2007). As with anticipation, the burden to prove invalidity by obviousness is "clear and convincing evidence." *Microsoft Corp.*, 2011 WL 2224428, *3.

b. Discussion

Soitec focuses on Bravman's testimony that claim 1 of the '812 patent is obvious because the Ito patent discloses all limitations of the claim except for the 10% thickness variability limitation,[14] and because it would have been obvious to combine the Ito patent with several prior art references disclosing that limitation. (D.I. 362 at 5) The court again focuses on the 10% thickness variability limitation as well as the "radially contained within the periphery of the bonded surface" limitation, which are the focus of MEMC's responsive papers.

According to Bravman, several prior art references – the Abernathy patent, the Abe patent, and the Maszara Table – disclose the 10% thickness variability limitation missing from the Ito patent. Bravman stated that the Abernathy patent: (1) describes as "[an] object of the invention to provide an improved SOI fabrication process in which the edging of the final silicon layer may be more precisely controlled;" and (2) states that, once the epitaxial portion of the wafer is removed using an etchant, the thickness of the remaining portion, 350 ± 4 nanometers, is within the 10% thickness variability

[14] Bravman conceded that the Ito patent did not teach the 10% thickness variability limitation on cross-examination. (D.I. 368 at 625:10-12)

range. (D.I. 368 at 600:9-601:5; PTX-418 at col. 2:58-61, col. 6:3-8) Bravman also cited the Abe patent's disclosure of a "chemical etching process [ ] stopped at an interface between a depletion layer including the n-type inversion layer and the p-type layer with the result that the chemically thinned layer having a very high thickness uniformity can be obtained." Specifically, example 1 of the Abe patent provides that, after chemical etching, a 1.1 μm thick silicon film was obtained, with a thickness uniformity of ± 0.01 μm (or a "very high thickness uniformity"). (D.I. 368 at 601:9-602:6; PTX-422 at col. 3:50-54, col. 5:29-39)

Lastly, Soitec relies on Bravman's testimony regarding the Maszara Table, which the court reproduces below for reference.

Table I. Summary of wafer thinning techniques for the wafer-bonding SOI, current best results

Method of thinning	Si thickness uniformity (μm)	Roughness	Process complexity	Comments	Reference
Polish-back					
1. Regular	±0.2	Excellent	Low	Si thickness uniformity depends on handle wafer	(27)
2. Small-area tool	±0.4	Excellent	Mod	Si thickness uniformity is independent of handle wafer	(29)
3. Polish-stop	±0.02	Excellent	High	Mask specific, complex	(28)
Etchback					
Chemical					
1. Single etchstop					
a) p^- epi on p^{++} substrate	±0.03-0.07	Good	Low	Difficult etching	(5, 25)
b) N_2 implant into p or n substrate	±0.002	?	Low	Implant damage (?) High N_2 content	(32)
2. Double etchstop					
a) B^+ implant + p^- epi	±0.005	Very good	Mod	Etchpits $\leq 10^3/cm^2$	(This work)
b) p^{++} epi + p^- epi	±0.012	Excellent	Low	Etchpits $\leq 3 \times 10^4/cm^2$	(This work)
c) B^+ implant at MeV	±0.005	Excellent	Low	Expensive implant	(Unpublished)
d) Si-Ge epi + p^- or n^- epi	±0.02[a]	?		MBE growth, misfit dislocations	(34)
Electrochemical					
1. Biased p-n junction etchstop	Good[b]	Poor	High	Complex preparation for biasing	(18)

[a] With diamond machining.
[b] 200:1 selectivity.

(JTX-94 at 345, table 1) The first numerical column of the Maszara Table discloses "Si thickness uniformity (μm)," or the thickness uniformity in microns. On direct examination, Bravman began to testify that all of the values in this column were less

than ten and, therefore, were well within the less than 10% thickness variation limitation. Counsel then corrected him in the following exchange:

> A. [ ] You can see these numbers are plus or minus all very small compared to ten. So no surprise, ten is a very, very large number in this context. So this art was heavily advanced in this time frame and got to very high uniformity.
>
> Q. These are variations in terms of microns, so it's two-tenths of a micron, four-[tenths] of a micron?
>
> A. I am sorry, you are right. It is not the percentages. So we would have to look at the original films to see how thick. I think if we do that, I know that it's within ten percent.
>
> Q. Certainly, the ['812] patent contemplates that the films can be up to, I think it's [50][[15]] microns. Right?
>
> A. Correct.
>
> Q. So would all of these variations be less than 10 percent at [50] microns?
>
> A. Sure. Because ten percent would be five microns and these are fractions of a micron.

(D.I. 368 at 603:23-604:21)

With respect to the motivation to combine the Ito patent with any of the Abernathy patent, the Abe patent or the Maszara Table, Soitec relies on Bravman's testimony that the less than 10% thickness variability limitation was "generally a well-understood concept" in the industry in 1994. (*Id.* at 597:9-18) It was Bravman's understanding, and "the understanding of many others," that the less than 10% variability limitation would have to be met in order to produce SOI that is acceptable for making MOSFET computer chips. (*Id.* at 597:18-599:4) Bravman also pointed to the

[15] MEMC corrects the testimony from "15 microns" to "50 microns" in view of Bravman's subsequent calculation. It appears as though a mistranscription occurred.

testimony of Dr. Robert Craven ("Craven"), a MEMC research scientist, that the less than 10% variability limitation was driven by customer applications at that point in time.[16] (*Id.* at 599:7-600:8)

Although it did not present a rebuttal validity expert, MEMC points to certain record evidence in support of the jury's verdict. Bravman admitted on cross-examination that the Ito patent is a "mechanical grinding polishing process" that does not disclose the less than 10% thickness variability limitation. (*Id.* at 624:17-625:4-12) In the Ito patent process, a beveled edge is created by "excessive[ly] polishing" the wafer, or grinding through multiple layers through the wafer body. (*Id.*) The polishing would not halt at the etch-stop layer. (*Id.*)

While MEMC's cited evidence is sparse,[17] the court declines to disturb the jury's determination that Soitec's evidence did not rise to the level of clear and convincing on this record. Bravman may have reasonably appeared ill-prepared on the stand and his confusion regarding the Maszara Table may have tarnished his credibility. Even if the jury accepted the testimony that customer applications drove the less than 10%

[16] Bravman's testimony in this regard was also elicited in response to leading questions, not unlike his exchange with counsel on the 10% thickness limitation discussed above.

[17] MEMC further argues that: (1) the text of the '564 patent (issued in 1994) states that "[t]hinning methods are not competitive from the uniformity and quality standpoints except when using the etch-stop principle" (JTX-85 at col. 1:64-66); and (2) U.S. Patent No. 5,032,544 to Ito et al., issued in 1991, states within its specification that "a variation in the thickness of the Si-monocrystal thin film produced from the wafer 1b was controlled within plus or minus 10% of a 5 μm target thickness of the Si-monocrystal thin film produced from the wafer 1b" (JTX-87 at col. 5:20-24). (D.I. 378 at 18, 20) MEMC points to no supporting testimony in these regards, however, and the court declines to find that a reasonable jury (of nonscientists) could independently comb the multitude of exhibits entered into evidence in this case and locate the relevant passages cited by MEMC in its post-trial papers. (*Id.*)

thickness variability requirement, Soitec did not appear to connect this customer-driven requirement to a particular disclosure in the prior art.[18]

Finally, the Ito patent does not involve etch-stop technology, in contrast to the Maszara Table. Soitec solely relies on Bravman's testimony that customers preferred less than 10% thickness variability in support of the motivation to combine these references. (D.I. 362 at 17-18 (citing D.I. 368 at 599:7-600:8) (stating that "[t]he commercial motivations in play at the time would manifestly have made such a combination obvious")) The jury could have reasonably found the foregoing insufficient to rise to clear and convincing evidence of invalidity, and Soitec's motion for JMOL or, in the alternative, for a new trial on the validity of the '812 patent is denied.

D. MEMC's Motion for JMOL or, in the Alternative, for a New Trial

MEMC asserts that the jury verdicts that claim 4 of Soitec's '009 patent is enabled and that it is not obvious are not supported by substantial evidence. The court will address these issues in turn.

1. Enablement

a. Standards

The statutory basis for the enablement requirement is found in 35 U.S.C. § 112, paragraph 1, which provides in relevant part:

[18] MEMC argues that the jury heard that most of Soitec's BSOI wafers shipped in 2007 and 2008 did not meet the thickness uniformity requirement of claim 1 of the '812 patent, but cites only counsel's closing arguments in support, along with a "delivery note" containing a technical description of the thicknesses of wafers shipped to one customer in 2007. (D.I. 378 at 21) MEMC cites no testimony describing the significance of the delivery note.

> The specification shall contain a written description of the invention and of the manner and process of making and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.

The Federal Circuit has explained that "patent protection is granted in return for an enabling disclosure of an invention, not for vague intimations of general ideas that may or may not be workable. . . . Tossing out the mere germ of an idea does not constitute enabling disclosure." *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997).

To satisfy the enablement requirement, a specification must teach those skilled in the art how to make and to use the full scope of the claimed invention without undue experimentation. *Genentech*, 108 F.3d at 1365. "While every aspect of a generic claim certainly need not have been carried out by the inventor, or exemplified in the specification, reasonable detail must be provided in order to enable members of the public to understand and carry out the invention." *Id.* at 1366. The specification need not teach what is well known in the art. *Hybritech v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384 (Fed. Cir. 1986).

Enablement is determined as of the filing date of the patent application. *In re Brana*, 51 F.3d, 1560, 1567 n.19 (Fed. Cir. 1995). The use of prophetic examples does not automatically make a patent non-enabling. The burden is on one challenging validity to show, by clear and convincing evidence, that the prophetic examples together with the other parts of the specification are not enabling. *Atlas Powder Co. v. E. I. Du Pont de Nemours & Co.*, 750 F.2d 1569, 1577 (Fed. Cir. 1984).

Some experimentation may be necessary in order to practice a claimed invention; the amount of experimentation, however, "must not be unduly extensive." *Id.* at 1576. The test for whether undue experimentation would have been required is not merely quantitative, since a considerable amount of experimentation is permissible if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed to enable the determination of how to practice a desired embodiment of the invention claimed. *PPG Indus. Inc. v. Guardian Indus. Corp.*, 75 F.3d 1558, 1564 (Fed. Cir. 1996) (quoting *Ex parte Jackson*, 217 U.S.P.Q. 804, 807 (1982)).

The jury in this case was instructed that it could consider several factors in determining whether undue experimentation is required to practice a claimed invention, including: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance disclosed in the patent; (3) the presence or absence of working examples in the patent; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (6) the predictability of the art; and (7) the breadth of the claims. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). These factors are sometimes referred to as the "Wands factors." Not every one of the Wands factors need be considered. Rather, the fact-finder is only required to consider those factors relevant to the facts of the case. *See Amgen, Inc. v. Chugai Pharm. Co., Ltd.*, 927 F.2d 1200, 1213 (Fed. Cir. 1991).

The enablement requirement is a question of law based on underlying factual inquiries. *Wands*, 858 F.2d at 737. Enablement is a question of law, which the Federal

Circuit reviews de novo, based on underlying facts, which the Federal Circuit reviews for clear error. *See Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008).

b. "First Substrate"

The first issue presented relates to the enablement of the "first substrate" limitation, which the parties agree is "material into which ions are introduced," without further limitation. (D.I. 155 at 7) It is undisputed that the '009 patent exemplifies specific process parameters for silicon, but not other "first substrates" as claimed. Claims encompassing multiple embodiments are not always invalid for lack of enablement when they are drawn against a specification disclosing a single embodiment. *See Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1336-37 (Fed. Cir. 2003) (affirming district court's finding of enablement of claims to "all vertebrate and mammalian cells" despite specification's disclosure of only mice cells where the district court made several fact-findings "indicating that any gaps between the disclosures and the claim breadth could be easily bridged") (distinguishing *In re Vaeck*, 947 F.2d 488, 495-96 (Fed. Cir. 1991)). The operative legal question is whether the jury had before it evidence that it could reasonably credit as bridging the gap between the disclosure (implantation of silicon with hydrogen) and claim 4 (implantation of a "first substrate" with hydrogen). The court frames its discussion against a backdrop of the parties' cited evidence in this regard.

(1) MEMC's cited evidence

MEMC's non-enablement arguments with respect to claim 4 of the '009 patent are framed within the context of the Wands factors. As noted above, the parties agree

that the "first substrate" limitation is a broad one. MEMC's expert, Dr. Robert S. Averback ("Averback"), testified that "first substrate" encompasses thousands of different materials, including semiconductors, metals, glasses and plastics. (D.I. 367 at 380:16-381:2; 403:19-404:21; 406:6-15) MEMC points out that Soitec's expert (Bravman) agreed that "materials" encompasses all of the foregoing. (D.I. 368 at 619:1-15)

Averback emphasized that the '009 patent concerns an unpredictable art. Averback agreed that the '009 patent "spell[s] out" how to implant hydrogen ions into silicon in a stable manner. (D.I. 367 at 390:12-17) He provided, however, that many issues in the field of implanting hydrogen into silicon wafers are not well-understood even today. (*Id.* at 391:20-24) To demonstrate this point, Averback relied on a 2006 paper reporting on the diffusivity of hydrogen in three related Group III semiconductors: gallium phosphide; gallium arsenide; and gallium antimonide. (JTX-96[19]) MEMC points out that Averback testified that hydrogen diffuses into gallium antinamide 1000 times slower than into gallium phosphide. (D.I. 367 at 399:10-19) Averback stated that dosages, energies and implant temperatures would not be the same for these materials because one would need to know the effect(s) of defects in the materials, which is a "har[d] question to answer." (*Id.* at 400:3-24)

Averback also testified that metals and glasses have very different properties than silicon, which forms natural cleaved planes. (*Id.* at 404:22-407:25) Irradiating

[19] Terreault, B., *Hydrogen blistering of silicon: Progress in fundamental understanding*, Physica Status Solidi 204, No. 7, 2129-2184 (2007). The article was received by the journal on October 27, 2006. (JTX-96)

polymers differ from silicon because such polymers cause bond breakage and linking of the polymer that causes a change in its properties. (*Id.* at 411:20-412:7)

MEMC also points to testimony by Dr. Chrystelle Lagahe ("Lagahe"), a Soitec scientist,[20] as evidence of the unpredictable nature of the art. Lagahe stated that transfer behavior "could be different" for crystalline versus amorphous material, and that transferring a layer of amorphous material "should be less favorable than in the crystalline one, but I [haven't] personally checked."[21] (D.I. 367 at 275:21-276:20) She was not aware of any research in this area. (*Id.* at 277:1-7) With respect to the quantity of experimentation necessary to practice claim 4, MEMC relies again on Averback, who stated that a "tremendous amount of work" would be required. (*Id.* at 395:10-15; 412:19-23; 447:11-24)

(2) Soitec's cited evidence

Soitec's expert (Bravman) testified that ion implantation is a "highly studied technique" that is well-documented in thousands of scientific publications. (D.I. 368 at 553:10-554:13) Bravman testified that, although a person of ordinary skill in the art of ion implantation and defect creation would have to experiment to implement the method of claim 4 of the '009 patent in different materials, the experimentation required was routine and, therefore, the claim is enabled.[22] (*Id.* at 581:3-582:1)

[20] Testifying via deposition.
[21] MEMC omits the latter portion of this quote in its brief. (D.I. 360 at 7)
[22] "It might take work. It might take weeks or months of work. But they would know what to do. They would know what to do in the lab." (D.I. 368 at 565:13-16; *see also id.* at 581:9-14)

Bravman testified that ion implantation is at least 50 years old and a well-documented technique. (*Id.* at 553:18-559:1) He explained that a person of ordinary skill in the art: (1) could "access a vast literature about implantation of hydrogen . . . into silicon, but also into other techniques;" (2) would have access to the commercially available tools to implement the process; (3) would know how to heat a wafer in this equipment and view surface changes evidencing the formation of microcavities; and (4) would "understand [that] the next thing to do is to contact the [handle] wafer," creating the bond, then heat the bonded wafers. (*Id.* at 565:3-567:22)

Bravman also compiled an exemplary list of publications describing hydrogen-induced blistering in various types of semiconductors, metallic glasses and pure metals. (*Id.* at 570:23-571:2; 572:19-574:4; PTX-405) Bravman's cited prior art described blistering or ion implantation techniques in several implant species (hydrogen, helium, neon, argon and xenon) and several types of substrates (silicon, germanium), ceramic material (silicon carbide) and metals (aluminum, niobium, palladium and erbium). (D.I. 368 at 568:1-570:18) Bravman stated that the prior art showed that these materials could be implanted to form a layer of microcavities as required by claim 4 of the '009 patent. (*Id.* at 570:14-18; *see also id.* at 581:3-14) For example, a 1977 article proposing a theory of blister and bubble formation based on research relating to helium in metals (e.g., niobium and vanadium) provided as follows: "It can be concluded that after many years of measurement on different aspects of the blister mechanisms and on ion implantation in metals the simple model developed in 1912 [by Stark and Wendt] still

works quite well for high ion energies, but needs considerable modification for energies below 15 keV." (*Id.* at 571:21-572:6; PTX-405 at 6 (citing PTX-335))

Soitec also points to the testimony of Dr. Michel Bruel ("Bruel"), inventor of the '564 patent over which the Aspar patents claim an improvement and co-inventor of the '009 patent. Bruel testified that blistering phenomena had been studied in semiconductors for 30 years using different kinds of ions. (D.I. 369 at 660:19-661:1) Bruel relied on some of this literature on blistering in selecting the parameters for his own experiments. (*Id.* at 663:19-664:15) Prior to applying for the '009 patent, Bruel had achieved layer transfer with silicon carbide material. (*Id.* at 670:3-671:18; PTX-426) Bruel wrote that "[i]n order to determine the minimum implanted dose required for the process, we used a simple test, the formulation of blisters after annealing," which is the same blistering phenomena occurring on silicon ions. (PTX-426; D.I. 369 at 673:10-24) It is not uncommon to set up a matrix of experimental conditions (such as dose and temperature) to find the best combination for a process, here specifically, blistering. (D.I. 369 at 678:9-23)

Finally, Soitec cites the testimony of inventor Dr. Bernard Aspar ("Aspar"). Aspar stated that, while at CEA Leti (Electronics and Information Technology Laboratory of the French Atomic Energy Commission) ("Leti"), scientists transferred layers off of silicon carbide, indium phosphide and gallium oxide. (D.I. 369 at 724:22-725:2) Leti scientists were able to achieve layer transferring for every substrate they tried, by: (1) reviewing the literature for published implantation conditions; (2) where none were published, "start[ing] some of the work with the material that we ha[d] done;" (3) reviewing material

for defects (such as blistering or micro-cracks) evidencing ion implantation; and (4) using condition alterations for defining and fine-tuning the process and defining the condition for the particular material. (*Id.* at 725:3-726:8) This process was "routine" and performed by student interns in the laboratory. (*Id.* at 726:9-15)

(3) Discussion

MEMC acknowledges the foregoing testimony and presents its post-trial arguments as follows. MEMC argues that Bravman oversimplified the experiments needed to determine whether the process would work with non-silicon "first substrates." (D.I. 360 at 8-10 ("There are countless different combinations of implantation doses, implantation energies, and heat treatments that one could attempt for a given material, and no way to predict what conditions, if any, will succeed with a given material"); *see also* D.I. 386 at 6-7[23])

The court disagrees with MEMC's characterization of Bravman's testimony as overly conclusory in this regard. Bravman testified at length that ion implantation, annealing and the creation of microcavities in implanted materials were well-understood in the art, ultimately concluding that a person of ordinary skill in the art could practice hydrogen ion implantation in other substrates by utilizing known techniques. (D.I. 368 at 553:18-559:1; 564:24-574:10; 577:2-581:14) That the task "might take weeks or months" is not dispositive of whether the quantity of experimentation required is "undue." (*Id.* at 565:13-15)

[23] In view of its holding, *infra*, the court denies as moot Soitec's motion to strike MEMC's reply brief in support for its JMOL/new trial motion as outside of the page limit requirements imposed by D. Del. LR 7.1.3. (D.I. 390)

As MEMC points out, Bravman admitted on cross examination that he has no personal experience cleaving implanted wafers and, thus, his enablement theory was supported with prior art references. (*Id.* at 628:15-17; PTX-405) In this regard, Bravman compiled a list of relevant prior art references for the jury's review. (PTX-405) While some of the cited references antecede the critical date, at least 7 are dated before 1996 and disclose the mono-implantation of hydrogen.[24] (D.I. 360, ex. 1) These references describe blistering by implanting hydrogen into semiconductors, silicon and metals and buttress Bravman's opinion. (PTX-405 (citing PTX-323; PTX-324; PTX-325; PTX-320 (implanting hydrogen in gallium phosphide, a semiconductor); PTX-336; PTX-339 (implanting hydrogen in gallium arsenide, a semiconductor); PTX-326 (hydrogen implanting generally)[25])

On the foregoing record, the court concludes that the jury had before it sufficient information from which to reasonably conclude that a person of ordinary skill in the art could perform mono-implantation of hydrogen into a first substrate without undue experimentation. MEMC's motion is denied on this ground.

c. Mechanical cleaving

[24] Other pre-critical date references describe blistering by implanting helium and other gases into semiconductors. The court disagrees with MEMC that references describing ion implantation by gases other than hydrogen are altogether irrelevant to enablement in these circumstances; for example, such data may be relevant to the level of predictability in the art, or other of the Wands factors. Notwithstanding, at least the hydrogen references support Bravman's testimony.

[25] The court notes that MEMC asserts that PTX-326 does not describe the mono-implantation of hydrogen, but includes an additional reference, PTX-366, as a pre-critical date disclosure relating to the mono-implantation of hydrogen. (D.I. 360, ex. 1)

As with the "first substrate" limitation, Soitec does not rely on the specification in response to MEMC's enablement challenge to mechanical cleaving. In its papers, Soitec points to Bravman's testimony that the literature evidenced that layer transfer was demonstrated successfully in a variety of materials: elemental semiconductors (silicon, germanium), diamond, quartz, sapphire, and metals (aluminum nitride, zinc oxide, lithium niobate). (D.I. 368 at 579:17-580:19) Bravman's opinion was that the experimentation described in the literature for achieving layer transfer was "routine for workers of skill . . . in the art using things such as ion implantation, microscopy, things that we do every day in typical labs."[26] (*Id.* at 580:20-581:14)

In the context of "first substrate," as discussed *supra*, Bravman buttressed his enablement testimony with reliance on prior art that described ion implantation in substrates other than silicon. The circumstances surrounding the "applying mechanical forces to fracture the solid bridges" limitation at bar are quite different. In the context of obviousness, Soitec admits that none of Bravman's enablement references describe mechanical cleaving. (D.I. 375 at 17 (noting the "**complete absence** of any discussion of mechanically cleaving a thin film" in Bravman's literature) (emphasis added)) Soitec stresses that the trial record is "bereft of any evidence that could support a finding that

[26] Soitec generally argues that the information in the prior art regarding microcavity formation and blistering "would have allowed a skilled artisan to determine whether and how materials were **amenable** to layer transfer without undue experimentation." (D.I. 375 at 10) (emphasis added) While this may be true, for claim 4 to be enabled, the '009 patent specification must teach the ordinary artisan how to **use** the claimed method. *See In re '318 Patent Infringement Litig.*, 583 F.3d 1317, 1323-24 (Fed. Cir. 2009); *In re Gleave*, 560 F.3d 1331, 1335 (Fed. Cir. 2009). Simply demonstrating that the skilled artisan could prepare the substrate for layer transfer is insufficient; the specification must enable one of ordinary skill in the art to practice the "applying mechanical forces" limitation contained in claim 4.

mechanical cleaving had been performed, even accidentally, before its discovery by the '009 patent inventors." (*Id.* at 14)

(1) The parties' cited evidence

Bravman testified that the literature described layer transfer as being accomplished successfully in a variety of materials: elemental semiconductors (silicon, germanium), diamond, quartz, sapphire, and metals (aluminum nitride, zinc oxide, lithium niobate). (D.I. 368 at 579:17-580:19) The experimentation that was described in the literature for achieving layer transfer was "routine for workers of skill [ ] in the art using things such as ion implantation, microscopy, things that we do every day in typical labs." (*Id.* at 580:20-581:14) Soitec does not point to specific evidence of record regarding "applying mechanical forces to fracture the solid bridges."

In stressing that the relevant art is highly unpredictable, MEMC asserts that the difficulty is finding conditions that will enable a mechanical cleave – for example, forming a natural cleave plane – not necessarily the actual mechanical separation. (D.I. 360 at 6-7) MEMC primarily points to a table characterizing Bravman's enablement references, in which it ascribes a "no" to a disclosure of mechanical cleaving. (D.I. 360 at 9 & ex. 1) MEMC does not point to any expert testimony in this respect. (*Id.*; D.I. 386 at 2, 4)

(2) Discussion

While MEMC is correct that Bravman did not specifically explain how references involving thermal cleaving processes support the enablement of the mechanical cleaving limitation, Bravman discussed the enablement of claim 4 as a whole, and the

jury was permitted to find this testimony credible. While conclusory expert testimony is an insufficient basis to support a finding of invalidity, *z4 Technologies, Inc. v. Microsoft Corporation*, 507 F.3d 1340, 1355 (Fed. Cir. 2007) (citation omitted), a party opposing invalidity may elect to put the challenger to its proof – much like MEMC did in electing not to call a validity expert in opposing Soitec's invalidity case with respect to the '812 patent. Thus, that Bravman's testimony was conclusory was not fatal (as MEMC suggests).

As stated above, the court is mindful that it was not incumbent upon Soitec to prove the enablement of its claim. Although MEMC cites to evidence supporting a finding of nonenablement,[27] the jury could have found that MEMC did not meet its high burden of proof on this record. The court does not disturb the jury's finding of enablement; MEMC's motion for JMOL and/or a new trial is denied on this issue. The court will address MEMC's argument regarding the inconsistency of Soitec's obviousness position in the following section.

2. Obviousness

As characterized by MEMC, the question presented on obviousness may be summarized as follows:

> When a person skilled in the art was practicing the '564 Bruel patent's layer transfer process in 1996 – by (1) implanting hydrogen ions into a silicon wafer, (2) bonding a stiffener to the implanted wafer, and (3) heating the wafer/stiffener

[27] MEMC asserts that the weight of its evidence on the Wands factors was so clearly in its favor that the jury verdict of enablement should not be sustained. The Wands factors are "illustrative, not mandatory." *See Amgen, Inc.*, 927 F.2d at 1213. The court does not supplant the credibility determinations made by the jury in these regards; its inquiry is limited to whether the record as a whole contains evidence acceptable to support the jury's enablement finding. *See Perkin-Elmer Corp.*, 732 F.2d at 893.

> pair to form a "cleaving plane" in the implanted wafer – and encountered an implanted wafer that did not thermally cleave during the heat treatment stage, would that person have thought to use mechanical force to complete the process by cleaving the implanted wafer at the "cleaving plane" and transferring the layer?[28]

(D.I. 386 at 15) MEMC submits that the answer to this question is "yes."

a. MEMC's cited evidence

In support of its obviousness theory, MEMC cites the testimony of Averback, who identified mechanical separation in the Maszara prior art reference. (JTX-104) Maszara discloses a blade technique whereby a blade is inserted between two bonded silicon wafers to separate them.[29] (D.I. 367 at 351:10-354:1) Tweezers or a plastic card would also work, as would the "peel test" method whereby adhesive is used as a separator. (*Id.*; *see also id.* at 373:15-376:11) Bruel testified that in 1994, he was aware of a separation method whereby a manipulator is attached to the wafer surface, transmitting mechanical forces to the wafer below. (*Id.* at 312:17-314:2) Bruel also stated that "everybody in the [ ] field of microelectronics knows that the edge of the [ ] wafers are rounded[, meaning] you can insert any mechanical tool between the two wafers." (*Id.*) A traction machine – typically used to evaluate bond energy between wafer layers – could also be used to break wafers (having metal glued to each section) apart. (*Id.* at 315:21-317:18)

[28] As noted *supra*, the '009 patent claims an improvement over the '564 patent; there is no dispute that the inventive contribution of the '009 patent was mechanical cleaving. (D.I. 375 at 9)

[29] The jury was asked to evaluate obviousness in view of a specific portion – Table 1 – of Maszara. It is not clear in this regard that MEMC's post-trial arguments align with the case it presented at trial.

MEMC also cites testimony by inventor Thierry Poumeyrol ("Poumeyrol"). Poumeyrol explained that he put a blue adhesive film on the surface of the implanted wafer to protect the implanted surface. He was preparing the wafer for a dicing machine, where it would be cut into small pieces for measurement. When the machine was broken, however, Poumeyrol removed the wafer and decided to also remove the blue film, whereupon he achieved a "fantastic transfer" of a layer from the wafer to the film. (D.I. 368 at 483:19-484:14) Poumeyrol confirmed that all he had to do was pull back on the film, and that Scotch® tape worked to effectuate transfer as well. (*Id.* at 487:4-9; *see also* D.I. 367 at 322:21-324:11)

Soitec scientist Christophe Malevill ("Malevill") testified that he has at times tried to pry wafers apart with an object (though has achieved poor results). Soitec uses a manually assisted blade (aptly called a guillotine) to perform mechanical cleaving. (*Id.* at 334:7-335:17) MEMC scientist Dale Witte ("Witte") testified that he has used razor blades and other objects to manually cleave a bonded pair of wafers, and that "anything thin [or] rigid will work." (*Id.* at 451:1-454:25) As Soitec points out, however, it is not clear from Malevill and Witte's testimony that their experiments occurred prior to the 1996 critical date for the '009 patent.

b. Soitec's cited evidence

It is Soitec's theory that "applying mechanical force to a bonded wafer pair was simple [but] realizing in the first instance that such force could be used to achieve layer transfer and understanding what conditions would make that possible was inventive." (D.I. 375 at 15) Soitec argues that MEMC did not present a prima facie case of

obviousness because it did not present any prior art describing mechanical cleaving. Further in this regard, Averback admitted that he was not aware of anyone using mechanical cleaving to separate entire wafers. (D.I. 367 at 435:10-438:3) Averback also admitted at his deposition that mechanical cleaving was only "possibly" obvious in 1996. (*Id.* at 443:6-11)

Soitec presented as rebuttal evidence the testimony of inventors Aspar and Poumeyrol that they were unaware of anyone using mechanical splitting before their invention. (D.I. 368 at 484:19-21; D.I. 369 at 727:2-7) Poumeyrol and Bruel also testified that it was a surprise that extremely thin films could be successfully transferred using mechanical forces to effectuate the separation. (D.I. 368 at 485:5-20; D.I. 369 at 681:10-682:17) Mechanical splitting allowed for the decrease in the implant dosage and annealing temperature, opening the scope to new applications such as incorporating electronics on the wafer and using supports that are not compatible with annealing (such as plastic). (D.I. 369 at 721:5-722:12)

While Bravman agreed that the prior art does not disclose mechanical cleaving, Bravman also detailed why he believed Maszara did not render the '009 patent claims obvious in view of Bruel. Maszara would be understood as a testing technique for testing the bond strength between two wafers, and it could not be applied to a thin film. (D.I. 368 at 532:21-535:1) Further, Bravman stated that Maszara does not talk about implanting ions to create a damage plane, and is directed to a very different issue (bond strength). (*Id.* at 535:2-13) As such, Maszara teaches away from pulling a layer off of

the bottom silicon wafer. (*Id.*) For similar reasons, the traction machine described by Bruel also relates to bond strength, and teaches away. (*Id.* at 535:15-536:2)

c. Discussion

As the verdict winner, the court must give Soitec the benefit of all logical inferences that can be drawn from the record evidence. *Perkin-Elmer Corp.*, 732 F.2d at 893. As noted above, Soitec squares its seemingly contrary enablement and obviousness positions by arguing that mechanical cleaving was easy for the skilled artisan, such that no particular apparatus for its effectuation need have been described in the '009 patent specification, however, using mechanical cleaving in the claimed context was not obvious to try.[30] This validity window was certainly a very narrow one, but Soitec appears to have driven its defenses through it. Maszara is the only § 102 prior art submitted to the jury that MEMC cites in its post-trial papers.[31] Crediting Bravman's testimony on this point, no motivation to combine existed due to the fact that Maszara concerned bond strength measurement rather than the production of thin layers of semiconductor. Assuming the jury determined that MEMC demonstrated a prima facie case of obviousness, the jury was permitted to credit the testimony of Bravman, Aspar, Poumeyrol and Bruel as detailed above as rebuttal evidence. Aside from Maszara, MEMC essentially argued that it would be obvious to try mechanical

[30] MEMC did not object to the verdict as inconsistent.

[31] The court notes that MEMC discusses a document entitled "Strativarious," which was the subject of Bruel's testimony at trial. (D.I. 360 at 18-19) The jury was only asked to decide the validity of the '009 patent in view of the '564 patent (JTX-85) and Maszara (JTS-104). (D.I. 343) While Bruel's general testimony about mechanical cleaving that is not specific to Strativarious was certainly within the realm of the jury's consideration, the Strativarious disclosure itself was not asserted § 102 prior art.

cleaving (whether by hand or assisted by machine). This theory required the jury to determine that there was "a design need or market pressure to solve a problem and there [were] a finite number of identified, predictable solutions," of which mechanical cleaving was one, and that mechanical cleaving led to anticipated success. *See KSR*, 550 U.S. at 421. MEMC itself stressed the unpredictability of this art at trial (*e.g.,* D.I. 367 at 391:13-24), and the jury could have reasonably credited Poumeyrol and Bruel's testimony with respect to surprise regarding the invention and unexpected results achieved by the invention as objective indicia of nonobviousness. (D.I. 368 at 485:5-20; D.I. 369 at 681:10-682:17; 721:5-722:12; D.I. 340 at 30, 32) The court does not disturb the verdict that MEMC did not meet its clear and convincing burden to demonstrate obviousness; its motion, therefore, is denied.

E. Soitec's Motion for Injunctive Relief and Damages Discovery

Soitec requests injunctive relief barring MEMC from: (1) making, using or selling wafers manufactured using the hydrogen-only process for making SOI wafers employed by MEMC between October 26, 2004 and June 16, 2006; and (2) "profiting from the 'head start' that it achieved in the marketplace by infringing [the '009 patent] between at least [these dates]." (D.I. 363) Soitec also requests that the court lift the stay on damages discovery vis a vis the '009 patent and set a trial "on [its] claims for damages **and** injunctive relief."[32] (*Id.*) (emphasis added)

1. Permanent injunction standard

[32] As injunctions are a matter of equity for the court's review, the court considers Soitec's request to be one for a trial on damages only.

In *eBay Inc. v. MercExchange, L.L.C.*, 126 S.Ct. 1837 (2006) (vacating and remanding *MercExchange, L.L.C. v. eBay Inc.*, 401 F.3d 1323, 1339 (2005)) (hereinafter "*eBay*"), the Supreme Court overruled the Federal Circuit's longstanding "general rule that courts will issue permanent injunctions against patent infringement absent exceptional circumstances." Permanent injunctions in patent cases must be based on a case-by-case assessment of the traditional equitable factors governing injunctions. *Id.* at 1839. That is, to be awarded a permanent injunction, a plaintiff must demonstrate: "(1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction." *Id.* "[T]he decision whether to grant or deny injunctive relief rests within the equitable discretion of the district courts, and that discretion must be exercised consistent with traditional principles of equity, in patent disputes no less than in other cases governed by such standards." *Id.* at 1841.

2. Discussion

The crux of Soitec's argument is that MEMC gained its market position at Soitec's expense through its infringement of the '009 patent and continues to build upon that market share. Soitec argues that it is "entitled" to an injunction barring MEMC from the marketplace for a period equal to its improperly-secured "head start" in the market. (D.I. 364 at 3-4, 10) Soitec does not sufficiently explain, however, why a complete bar on market participation is necessary to avoid irreparable injury. (*Id.* at 12-13) There is

no indication that MEMC still employs its hydrogen-only process.[33] While it may be true that an injunction against future infringement of the '009 patent would work no hardship to MEMC in that event (*id.* at 2), this does not alleviate Soitec's burden to prove irreparable injury to itself or that such injury is not compensable by money damages.

With respect to irreparable injury, Soitec states only that an injunction barring MEMC's competition "will forestall an irreparable injury to Soitec's competitive standing which cannot be precisely remedied at law by money damages." (*Id.* at 12) Soitec also states, without citation to evidence, that "MEMC depressed Soitec's profits and revenues and, in the long run, will injure Soitec's competitive advantage." (*Id.* at 13) Similarly, MEMC's head start will "continue to compound" in the market place. (*Id.*) Soitec does not present sufficient facts in support of either claim.[34] By contrast, Soitec's own statement of facts indicates that Soitec had 80-90% of the SOI wafer market share in 2004, and has 90-100% market share (including its licensees) today. (*Id.* at 8) Soitec states that its revenues were depressed by MEMC's actions, without further detail. (*Id.*)

It is not apparent at this juncture that Soitec's monetary damages are incalculable. Soitec asserts that damages discovery will ultimately reveal that money damages will be **insufficient** to compensate Soitec for MEMC's accelerated market

[33] Nor is there any indication that MEMC seeks to resurrect its hydrogen-only process. (D.I. 364 at 12; D.I. 376 at 3) If it did, it would do so at its own risk in view of the adverse jury verdict.

[34] Soitec maintains that certain supporting facts were elicited at trial, "[o]thers are supported by documents and information produced during discovery in this action[, and] [s]till others will be supported by Soitec's witnesses at a [future] hearing on the merits." (D.I. 389 at 7)

entry achieved by its infringement of the '009 patent. (D.I. 389 at 9-10 ("isolating the economic consequences of MEMC's conduct will be hard"); *see also* D.I. 364 at 9 ("What MEMC's ultimate benefit from its accelerated market entry will turn out to be is hard to calculate, since the story is not over yet")) As it is unclear at this juncture what damages discovery will reveal in this regard, the appropriateness of a permanent injunction cannot be weighed on this record. Finally, as per its practice, the court declines to open damages discovery or schedule any further proceedings prior to the Federal Circuit's review of the verdict. Soitec's motion is denied.

V. CONCLUSION

For the foregoing reasons, the court denies MEMC's motion for reargument on inequitable conduct, denies Soitec's motion for reconsideration of its request to modify the protective order, denies both parties' motions for JMOL or, in the alternative, a new trial, and denies Soitec's motion for a permanent injunction and a lift on the stay on damages discovery. Soitec's motions for leave to file a reply in support for its motion for reargument and to strike MEMC's reply brief in support for its JMOL/new trial motion are denied as moot. An appropriate order shall issue.