

Polyclad v. MacDermid, et al. CV-99-162-M 09/27/02  
UNITED STATES DISTRICT COURT

DISTRICT OF NEW HAMPSHIRE

Polyclad Laminates, Inc.,  
and Fry Metals, Inc., d/b/a  
PC Fab Division of Alpha Metals, Inc.,  
Plaintiffs

v.

Civil No. 99-162-M  
Opinion No. 2002 DNH 173

MacDermid, Inc.,  
Defendant

### **O R D E R**

Defendant MacDermid, Inc., moves for summary judgment on plaintiffs' infringement claims. Plaintiffs have also moved for summary judgment relative to infringement.

### **Background**

Critical to resolving this dispute is the meaning of the term "surfactant" as used in United States Patent No. 5,800,859 ("859 patent"). The '859 patent teaches a process for copper coating printed circuit boards, in which a metal surface is treated in a manner that promotes the adhesion of alternating layers of conducting (e.g., copper) and non-conducting materials

(typically plastic or fiberglass). Claim 1 of the '859 patent, the only independent claim, teaches:

A process for treating a metal surface to promote adhesion thereto, comprising contacting the metal surface with an adhesion promotion composition comprising 0.1 to 20% of weight hydrogen peroxide, an inorganic acid, an organic corrosion inhibitor, and a surfactant to form a microroughened conversion-coated surface, and adhering a material to the microroughened conversion coated surface.

See '859 patent, claim 1, column 9, lines 60-67, (emphasis supplied).

Following a Markman hearing, the court held that the term "surfactant," as used in the '859 patent and as properly construed, means and would be understood by a person skilled in the relevant art to mean:

a substance that, when introduced into a liquid solution at comparatively low concentrations, dramatically reduces the surface tension of that solution or the interfacial tension between the solution and another surface. Typically, though not necessarily, surfactants have an amphipathic structure - that is, a hydrophobic tail and a hydrophilic head - and, at equilibrium, the concentration of the surfactant at a phase interface is greater than its concentration in the bulk of the solution. By way of example, when introduced at concentrations of less than one percent, "surfactants," as that term is used in the

'859 patent, will reduce the surface tension of pure water (at room temperature) to at least 45 dynes/cm or less.

Order, September 12, 2001 (document no. 167).<sup>1</sup> See generally Markman v. Westview Instruments, Inc., 517 U.S. 370 (1996).

### **Literal Infringement**

Given that construction, and the absence of any dispute as to material facts, it is apparent, as a matter of law, that defendant has not literally infringed the '859 patent.

Defendant manufactures and sells a chemical composition, called Multibond, which is used in the printed circuit board industry to promote adhesion between layers in multi-layered boards. Plaintiffs' '859 patent covers such a process, disclosing a similar chemical composition. However, the '859

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<sup>1</sup> Plaintiffs sought clarification of this construction, claiming confusion as to whether a generally accepted surfactant would be defined out of that category because it might not cause the requisite surface tension reduction at, say, .00001% (i.e., "less than one percent"). But, perhaps obviously, the issue is better stated as: What effect is achieved at .99999% (i.e., "less than one percent")? Under the construction adopted by the court, surfactants would generally be expected to achieve dramatic surface or interfacial tension reduction at .99999%.

patent's description of the protected chemical composition specifically discloses the requirement that a "surfactant" be included. Defendant's product, Multibond, does not include a surfactant, as the "CARBOWAX MPEG 2000"<sup>2</sup> ingredient (claimed by plaintiffs to qualify as a surfactant) does not act, at comparatively low concentrations, to dramatically reduce the surface tension of the defendant's chemical composition or the interfacial tension between the solution and another surface (e.g., the copper).

Plaintiffs concede that point (but, of course, preserve their objection to the court's construction of the term "surfactant" relative to the '859 patent).

### **Doctrine of Equivalents**

Plaintiffs rely, alternatively, on a "doctrine of equivalents" claim. They argue that even if MPEG used by defendant does not literally qualify as a surfactant under the '859 patent (as the term has been construed by the court), it

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<sup>2</sup> "CARBOWAX MPEG 2000" is a commercial name for the chemical compound methoxy polyethelene glycol.

nevertheless functions like a surfactant, and it performs that function in the same way as a surfactant, and it achieves the same result achieved by the surfactant disclosed in the '859 patent process (uniformity of the desired microroughened adhesion layer).

Although the doctrine of equivalents "is not free from confusion," it remains viable. Warner-Jenkinson Co. v. Hilton Davis Chemical Co., 520 U.S. 17, 21 (1997). Under the doctrine,

a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is "equivalence" between the elements of the accused product or process and the claimed elements of the patented invention.

Id. (citing Graver Tank & Mfg. Co. v. Linde Air Products Co., 339 U.S. 605, 609 (1950)). The Supreme Court clarified the doctrine's scope in Warner-Jenkinson, essentially holding that, in order to respect the scope of patent protection, and preclude enlargement of that scope through application of the equivalents doctrine,

[e]ach element contained in a patent claim is deemed material to defining the scope of the patented

invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. It is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety.

Id. at 29 (emphasis supplied).

On this record it is clear that MPEG does not function as the equivalent of a surfactant, as that term is used in the '859 patent. MPEG is not amphipathic; does not concentrate to a greater degree at a phase interface than in the bulk of the solution; and, critically, does not dramatically reduce surface tension of the composition solution, or interfacial tension between the solution and another surface, at comparatively low concentrations (less than 1%) (and, for that matter, it does not dramatically reduce surface tension even at comparatively high concentrations). There is no serious dispute as to these material facts.

As noted, literal infringement would require use of an additive that, although not necessarily amphipathic in structure, (1) operates to dramatically reduce surface tension of a

solution, or interfacial tension between a solution and another surface (here, the copper layer), (2) when introduced into the solution at comparatively low levels. Additives that exhibit at least one of those two qualifying attributes - i.e., that either dramatically reduce surface or interfacial tension when added to a solution at comparatively high concentrations, or that at comparatively low concentrations modestly (but effectively for purposes of the process) reduce surface or interfacial tension - might qualify as "equivalents" of a surfactant relative to the patented process. But, defendant's additive, CARBOWAX MPEG 2000, possesses neither characteristic.

Even accepting, for argument's sake, plaintiffs' contention that defendants intend MPEG to function as the equivalent of a surfactant, it does not do so.<sup>3</sup> It's effect is to modestly reduce surface or interfacial tension at comparatively high concentrations. MPEG may well have a "wetting effect" and defendants might intend to capitalize on that wetting effect to promote uniformity of the resulting adhesion layer. But, MPEG is

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<sup>3</sup> Of course, since Warner-Jenkinson, "[t]he better view, and the one consistent with . . . the objective approach to infringement, is that intent plays no role in the application of the doctrine of equivalents." Warner-Jenkinson, 520 U.S. at 36.

not the equivalent of a surfactant because it functions differently - it modestly reduces surface/interfacial tension at comparatively high concentrations - albeit perhaps in a manner that enhances adhesion layer uniformity to some degree.

Although different linguistic formulations have been used to describe the applicable test in gauging "equivalence," the essential inquiry remains:

Does the accused . . . process contain elements identical or equivalent to each claimed element of the patented invention? Different linguistic frameworks may be more suitable to different cases, depending on their particular facts. A focus on individual elements and a special vigilance against allowing the concept of equivalence to eliminate completely any such elements should reduce considerably the imprecision of whatever language is used.

Id. at 520 U.S. 40 (emphasis supplied).

The problem plaintiffs cannot overcome is this: the patent claims the use of a "surfactant;" it does not claim the use of any and all "wetting agents" or "spreaders" (and, if it did, vagueness issues would almost certainly arise). Defendant's additive is not a surfactant. And, while it may have some modest

wetting or spreading effects, it could be deemed the equivalent of a surfactant only by construing every possible additive that might produce a wetting or spreading effect as being equivalent. Such a construction would improperly “[allow] the concept of equivalence to eliminate completely” the surfactant element of the claim. Id. at 40.

Now is not the time or place for plaintiffs to seek to expand their “surfactant” claim, under the equivalents doctrine, to include any and all additives that might have a “wetting effect” or even to include all additives with wetting characteristics sufficient to achieve an acceptably uniform micro-roughened surface on a copper layer of a printed circuit board. The universe of qualifying substances meeting either of those rather broad descriptions is simply too large and, if declared to be equivalent, would expand the claim well beyond its legitimate boundary. Plaintiffs’ claim is limited to the wetting effect occasioned by surfactants (and equivalent additives - i.e., those that either dramatically reduce surface tension at high concentrations or those that modestly reduce surface tension at low concentrations), but does not reach any and all additives

to a process solution that might have some surface tension-reducing effect. Defendant's MPEG additive is not the chemical equivalent of a surfactant, as that term is used in the '859 patent.

### **Conclusion**

Accordingly, for the reasons given above, and those set forth in Defendant's Memorandum of Law in Support of Motion for Summary Judgment, which the court adopts, Defendant's Motion for Summary Judgment (document no. 169) is granted. Plaintiffs' Motion for Summary Judgment (document no. 186) is denied. The Clerk shall enter judgment in favor of defendant and close the case.

**SO ORDERED.**

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Steven J. McAuliffe  
United States District Judge

September 27, 2002

cc: Howard J. Susser, Esq.  
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