

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

UPONOR, INC.,

Plaintiff/Counter-Defendant,

v.

UNIQUE INDUSTRIAL PRODUCT
COMPANY,

Defendant/Counter-Plaintiff.

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CIVIL ACTION NO. H-07-2986

AFFIDAVIT OF CYNTHIA L. SMITH

The undersigned, CYNTHIA L. SMITH, being first duly sworn on oath deposes and states that if called as a witness in this matter I would testify as follows:

1. I have personal knowledge regarding the matters set forth herein.
2. Since October, 2007 I have been employed with Metallurgical Technologies, Inc. (MTI) as a Senior Materials Engineer and Technical Manager. In that capacity, I perform and direct failure analysis, forensic chemistry, material testing and analysis, and corrosion investigations. Prior to working at MTI, from July 2002 through October 2007, I was employed by Uponor North America as Manager of Material Analysis. In that capacity I created and managed an analytical engineering services laboratory dedicated to material research and development, failure analysis and investigative chemistry. As Manager of Material Analysis I managed a team of six engineers and technicians responsible for process engineering, and I also managed the material analysis laboratory for Uponor which included services relating to failure analysis of metals and polymers, forensic chemistry, oxidation/degradation analysis of polymers, corrosion studies, and material specification/design support.



3. During the period of July 2002 through October 2007 while I was the Manager of Material Analysis for Uponor, I conducted hundreds of failure analyses and generated reports discussing failures of metal and plastic products, including obtaining chemical analysis relating to the failure of metal components. My work in analyzing/evaluating failed metallic and plastic components has included visual inspection, stereo microscopy, metallography, radiography, Fourier transform infrared spectrometry, scanning electron microscopy, differential scanning calorimetry, and energy dispersive x-ray spectroscopy. Additionally, during the course of my employment with Uponor, I routinely sent metal products to testing laboratories for quantitative chemical analysis performed by optical emissions spectrometry. Well over 100 chemical analyses were requested. During the period of 2001 through July 2002 I was Director of Failure Analysis and Investigative Chemistry at Stork Twin City Testing in St. Paul, Minnesota. In that capacity, I managed a team of five metallurgists and chemists providing engineering consulting in failure analysis, metallurgical engineering, investigative chemistry, polymer analysis, and corrosion investigations. During my employment at Twin City Testing, I routinely reviewed and approved chemical analysis reports for metal components, where the chemical composition of the metal was determined by Optical Emissions Spectrometry and/or by Inductively Coupled Plasma Spectrometry. A copy of my Curriculum Vitae is attached hereto as Exhibit "A".

4. Prior to working at Stork Twin City Testing, I was employed by AlliedSignal Engines as a materials engineer performing failure analysis (including metallurgical analyses) of turboprop and gas turbine engine components in support of design, warranty administration, materials and process engineering, and flight safety. I performed numerous investigations which were attended by FAA and NTSB representatives including analysis of failure mechanisms for metal components of aircraft engines. During my employment with AlliedSignal Engines, I

periodically requested that metal samples be analyzed for chemical composition determined by inductively coupled plasma spectrometry, and I was responsible for interpreting the resulting data for conformance to specification.

5. During the course of my employment with Uponor, I participated in meetings with representatives of Unique Industrial Product Company, including Jay Milani, Pradeep Gupta and Hetal Bhavsar in connection with failures of brass fittings and plastic swivel nuts. These meetings took place between August 2006 and January 2007, and included a meeting in January 2007 attended by representatives of Duk San, which was involved in the manufacture of both the brass fittings and plastic swivel nuts involved in this claim.

6. Based upon my personal interaction with representatives of Unique and representatives of Uponor, I became familiar with the design and specifications for both the brass F1807 fittings and the plastic swivel nuts.

7. I attended meetings with Unique's personnel and representatives of Duk San during which the parties discussed the specifications for the brass fittings and plastic swivel nuts, the source of the specification and design for those products as well as the testing and approval/rejection of those products. Unique's representatives supplied me with a design drawing for plastic swivel nuts which identified "Unique Industrial Product Company" as the designer of the swivel nut, and RTI as the "end user". A copy of that design drawing is attached hereto as Exhibit "2".

8. In various meetings with representatives of Unique from August 2006 through January 2007, Unique's representatives confirmed the brass fittings were distributed by Unique and never disputed that the swivel nuts had been distributed by Unique. Furthermore, at a meeting in January 2007, at which representatives of Duk San were presented, no issue was ever

raised as to whether the brass F1807 fittings and plastic swivel nuts had been manufactured by Duk San and distributed by Unique for Duk San.

9. A subsidiary of Uponor, Radiant Technology, Inc. ("RTI") initially purchased the fittings from Unique with the requirement that the fittings comply with ASTM Standard F1807. The applicable material standard referenced by F1807 is ASTM B283 which applies to copper and copper-alloy die forgings. The B283 Standard for chemical analysis, by its own terms, applies to finished product, not simply raw materials. For example B283 states that "one sample for chemical analysis shall be taken for each heat at the time of pouring or from semi finished or finished product". See ASTM B283, S3.3 a copy of which is attached hereto as Exhibit "3".

10. ASTM E478 is not the standard test method for chemical analysis, but rather is a referee test method that can be invoked if the parties so agree in order to obtain test data when other test standards have resulted in disagreement. See ASTM B283 Section 13.1.1 and 13.1.2. In this case the parties never agreed to use E478 for chemical analysis testing. The chemical testing undertaken by Unique prior to Uponor filing suit, was performed by A&M Technical Services and Shiva Laboratories, both of which used the same methods as Uponor and, as is typical in the industry, make no reference to ASTM standards, including Standard E478. A copy of the A&M Technical Services, Inc. chemical testing data is attached hereto as Exhibit "4".

11. Duk San's quality assurance data reflects that only one sample per lot of brass fittings was subjected to chemical analysis.

12. I examined and analyzed new brass fittings which were never installed. Those fittings, "out of the bag" showed evidence of micro-cracking. In light of these findings regarding new fittings that were never installed, I concluded that faulty installation was not a cause of failure in the brass fittings supplied by Unique.

13. My conclusion that faulty installation was not a cause of failure in the brass fittings supplied by Unique was further supported by the history of fitting failures. A sudden rash of failures occurred in multiple states (where varying water chemistry conditions existed) during a narrowly defined time period, involving various plumbing contractors who had previous experience successfully installing these components. This fact also undermines any question of installation error.

14. There was no reason to investigate the specific design of the brass fittings, as that design has been successfully used in the plumbing industry for a number of years without incident.

15. Uponor was able to identify the brass fittings that were failing as having been supplied by Unique based upon the distinctive "US-PW" marking on those fittings. No company other than Unique had supplied fittings to Uponor with the "US-PW" marking and the failed fittings that were being returned by plumbers, wholesalers and developers exhibited the distinctive "US-PW" marking.

16. The F1807 brass fittings are not threaded and cannot be "over-tightened" during the course of installation.

17. With respect to plastic swivel nuts, an installation error is not plausible as a failure mechanism where the swivel nuts contain substantial voids/pores in the walls of the plastic nuts or a square thread root, as both of these phenomena relate to the manufacture of the plastic nut.

18. There is no reliable "test" to determine the "relative importance" of the porosity and design issues with the swivel nuts involved in this case. I assessed the relative importance of porosity and design/molding deficiencies in swivel nuts by examining the fractures and

observing that the initiation point for the fractures was associated with stress concentrations in the thread routes, and the fact voids/pores in the molded walls of the plastic nuts were bisected within the plane of fracture.

19. The presence of the voids/pores in the plastic nuts substantially diminished the structural integrity of the swivel nut walls, thereby significantly increasing the probability of failure, even without the presence of the improper thread root geometry. In some cases the voids/pores consumed 50% of the wall thickness of the plastic nuts.

FURTHER AFFIANT SAYETH NOT.


CYNTHIA L. SMITH

Subscribed and Sworn to before
me this 30 day of March, 2009.


NOTARY PUBLIC

My Commission Expires:

6/7/2011

