

## 3SAE Technologies Liquid Clamp Cleaver LDF Performance

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### Introduction

Nufern supplied 3SAE Technologies with fiber samples of five LMA, PLMA and MM Large Diameter, LD fibers measuring 400um and up. The following LD fibers were supplied for evaluation on 3SAE Technologies Liquid Clamp Cleaver LDF:

<b>Fiber</b>	<b>Description</b>
LMA-GDF-20/400	Large Mode Area (LMA), Passive- Round Cladding
LMA-YDF-20/400	Large Mode Area (LMA), Active - Octagonal Cladding
PLMA-GDF-20/400	Polarization Maintaining (PM), Large Mode Area (LMA), Passive- Round Cladding
PLMA-YDF-20/400	Polarization Maintaining (PM), Large Mode Area Round (LMA), Active- Round Cladding
MM-GDF-400/480	Multimode (MM), Passive- Round Cladding

Of the above samples, four LD fibers have a round cladding structure and the remaining LD fiber has an octagonal cladding structure. The information in this document is a summary of cleave angle results obtained on the supplied fibers.

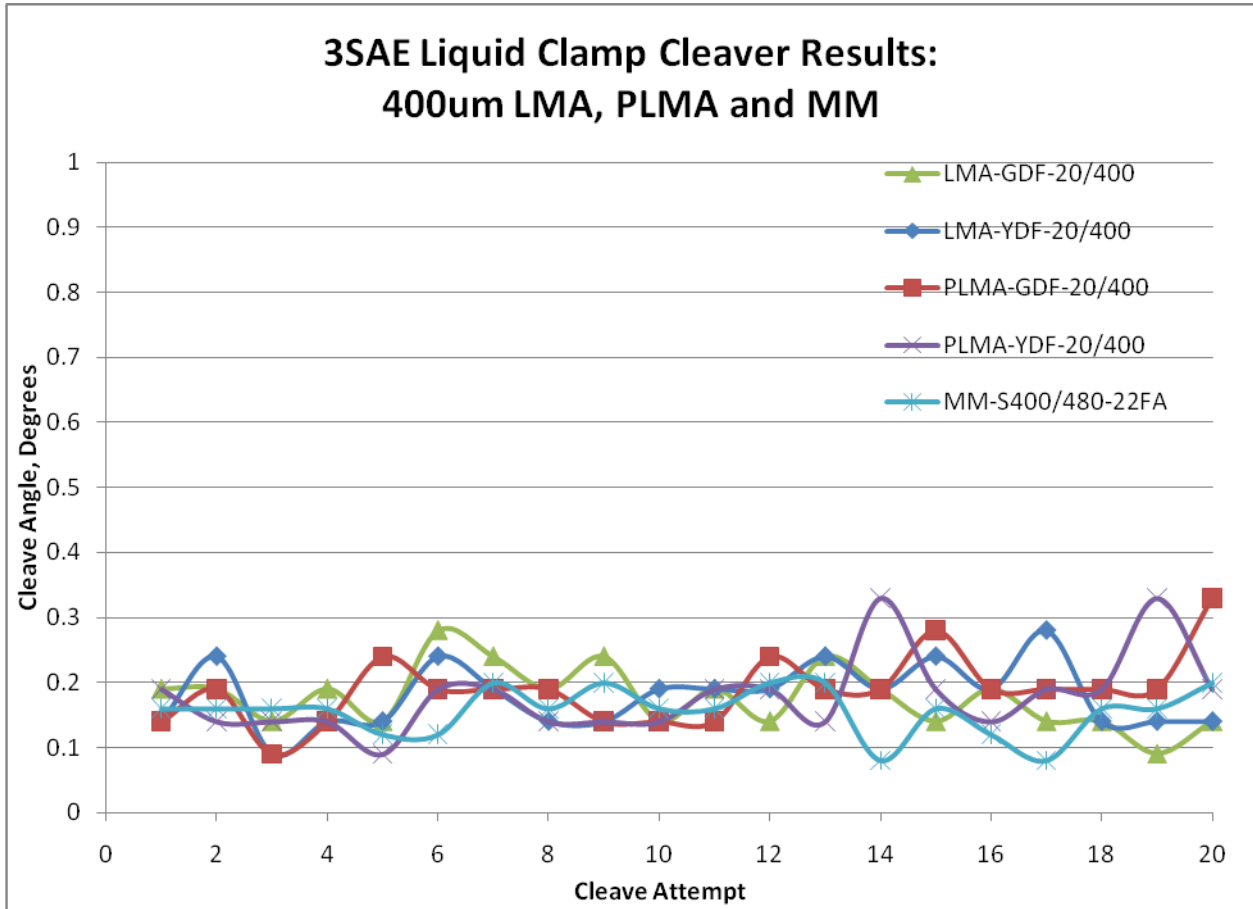
### Background

3SAE Technologies recently introduced a new Liquid Clamp Cleaver LDF, a tension based LDF cleaving technology specifically designed for cleaving fibers from 125 to 1000um in diameter. The Liquid Clamp Cleaver LDF utilizes a novel, patent pending, liquid metal to secure the scrap portion of the cleaved fiber. Liquid clamp cleaving technology revolutionizes LD fiber cleaving by ensuring that fibers are clamped in a purely torque free manner, thereby minimizing fiber cleave angles. As a result the Liquid Clamp Cleaver LDF produces low angle cleaves with industry leading consistency.

The Liquid Clamp Cleaver LDF design also ensures hassle free transition between fiber diameters and external cladding shapes without the need for exchanging fiber clamps. The universal clamping approach eliminates the necessity of purchasing additional fiber holding block sets to handle multiple discreet ranges of fiber diameters within the complete operating range of the cleaver. The LCD user interface provides continuous status updates as well as quick access to up to ten customizable cleave programs.

## Results

The following chart displays the Liquid Clamp Cleaver LDF results for, 400um and up round and octagonal fibers. Twenty consecutive cleaves were performed on each of the five fiber samples. The cleave angles were measured and recorded for each cleave using a Nyfors CleaveMeter LDF interferometer.



The following table summarizes the cleave results of the above chart.

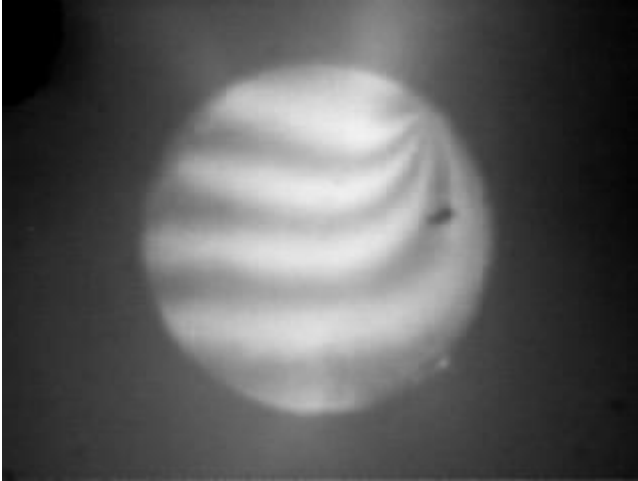
### Cleaving Results Summary

Fiber:	LMA-GDF-20/400	LMA-YDF-20/400	PLMA-GDF-20/400	PLMA-YDF-20/400	MM-S400/480-22FA
<b>Average:</b>	0.18	0.18	0.19	0.18	0.16
<b>StDev:</b>	0.05	0.05	0.05	0.06	0.04

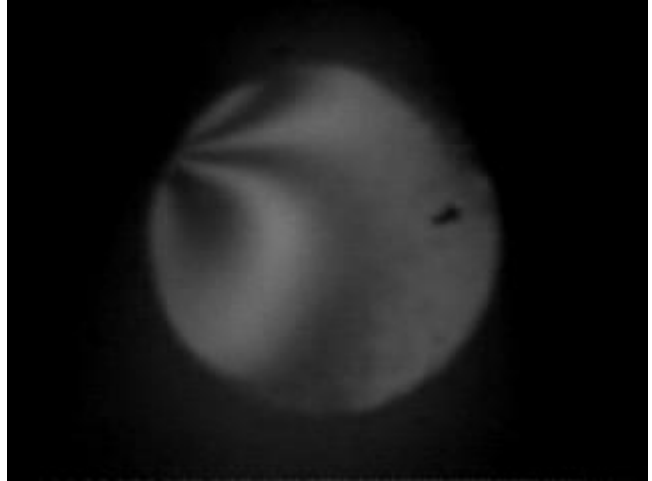
### Fiber Cleave Images

Shown below are three cleaves from each LD Fiber type which were recorded during the Liquid Clamp Cleaver LDF evaluation and are representative of the recorded data.

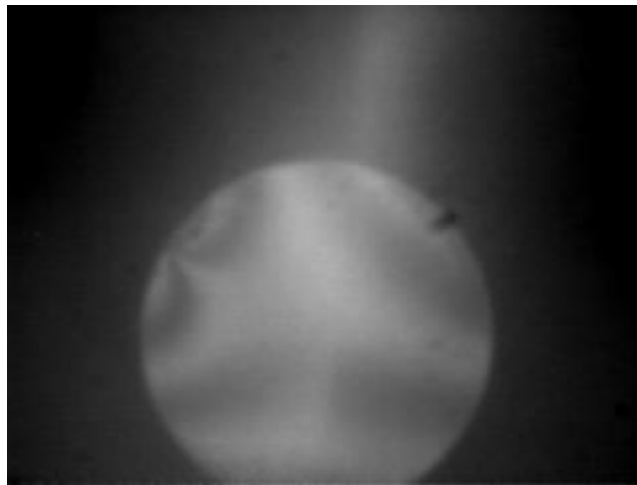
**Nufern LMA-GDF-20/400:** Large Mode Area (LMA), Passive- 400um Round Cladding



Cleave Angle: 0.19 deg.

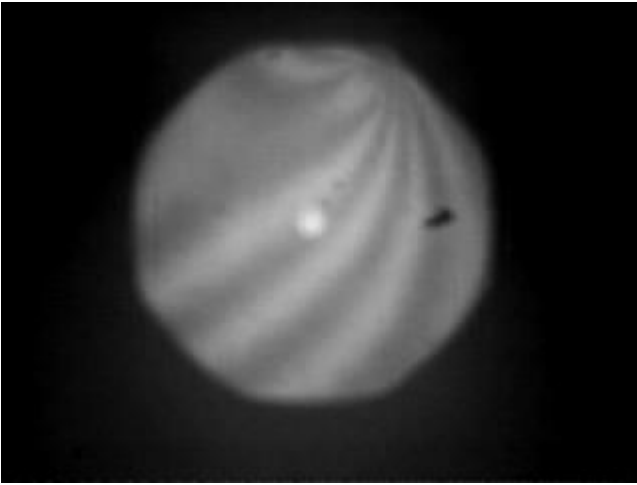


Cleave Angle: 0.09 deg.

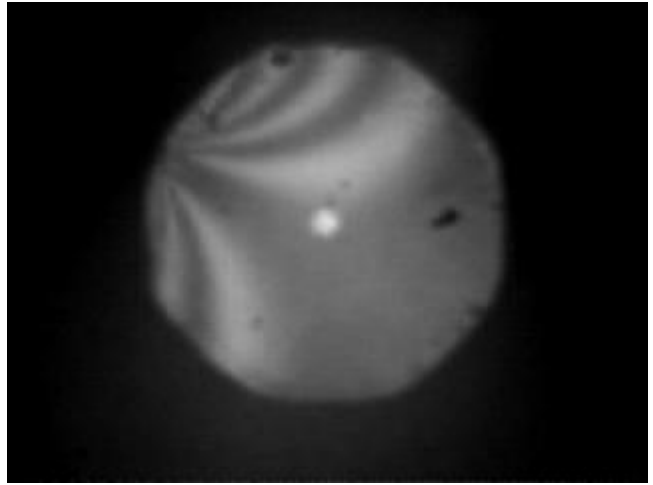


Cleave Angle: 0.14 deg.

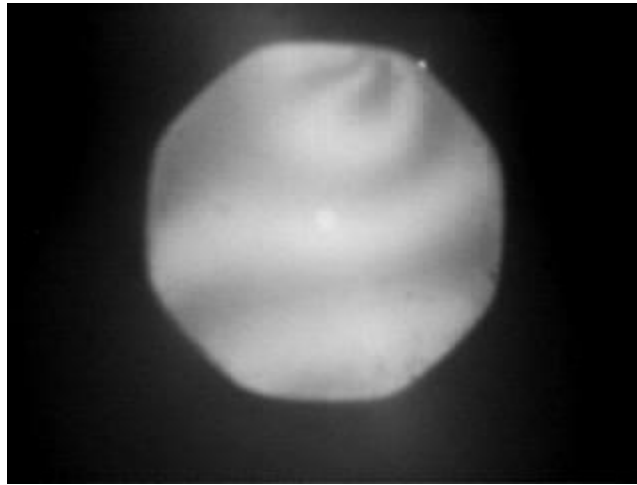
**Nufern LMA-YDF-20/400: Large Mode Area (LMA), Active- 400um Octagonal Cladding**



Cleave Angle: 0.19 deg.



Cleave Angle: 0.14 deg.

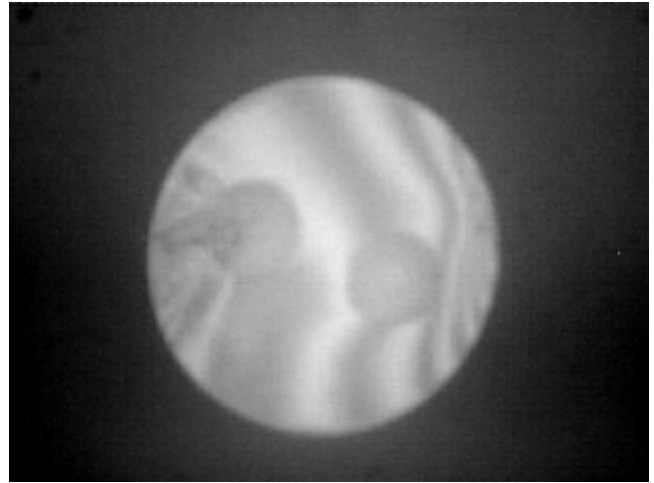


Cleave Angle: 0.19 deg.

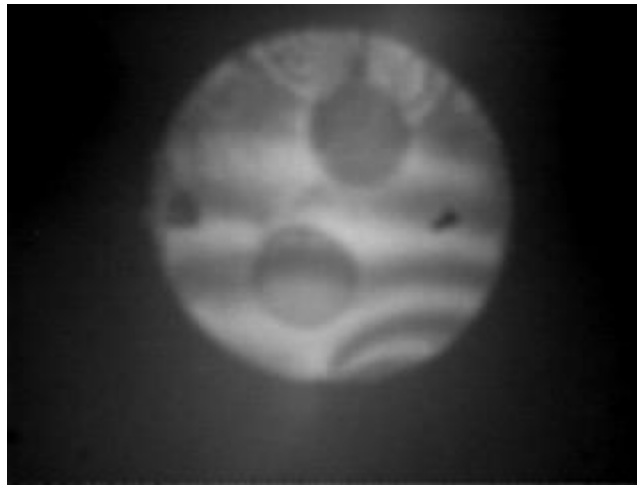
**Nufern PLMA-GDF-20/400: Polarization Maintaining (PM), Large Mode Area (LMA), Passive- 400um Round Cladding**



Cleave Angle: 0.19 deg.

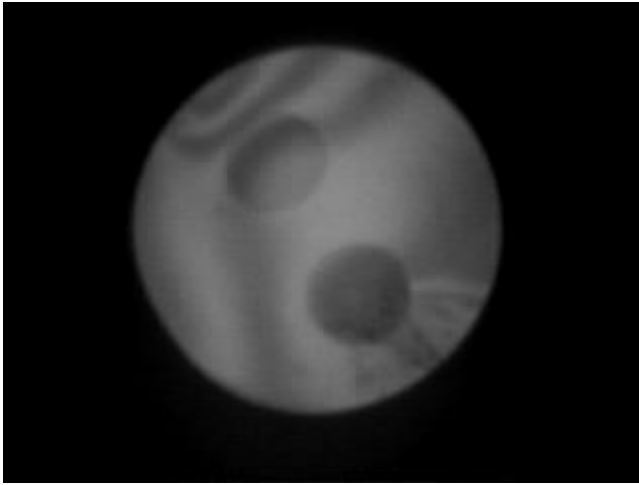


Cleave Angle: 0.19 deg.

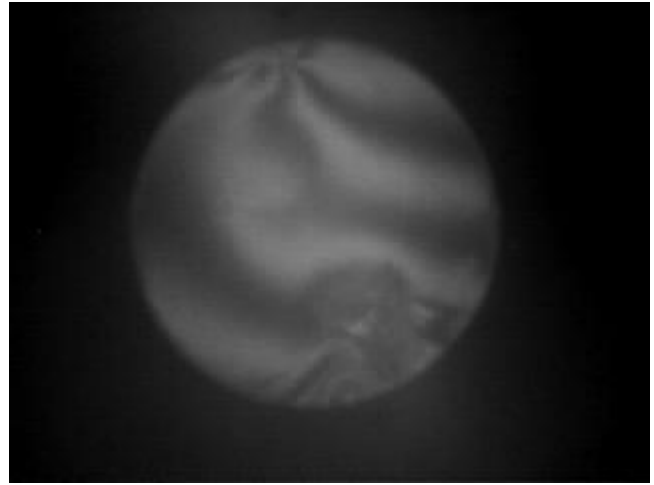


Cleave Angle: 0.14 deg.

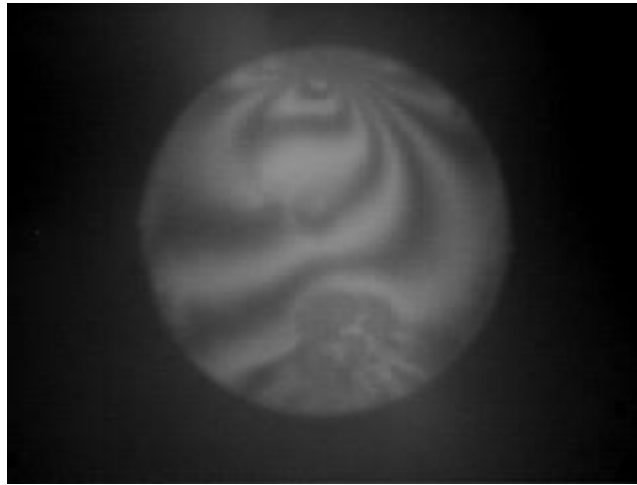
**Nufern PLMA-YDF-20/400: Polarization Maintaining (PM), Large Mode Area (LMA), Active- 400um Round Cladding**



Cleave Angle: 0.19 deg.

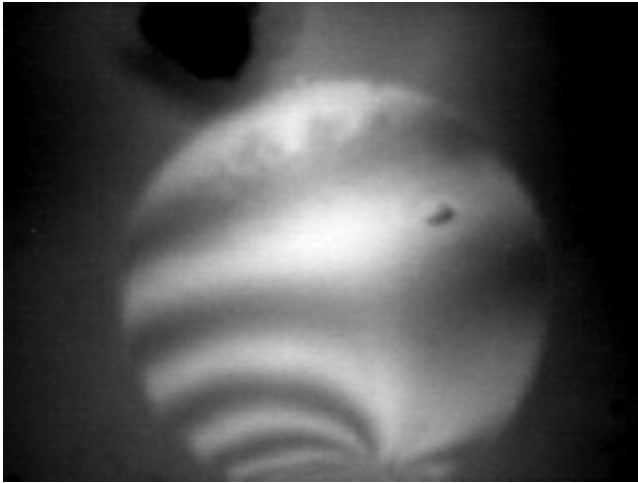


Cleave Angle: 0.14 deg.

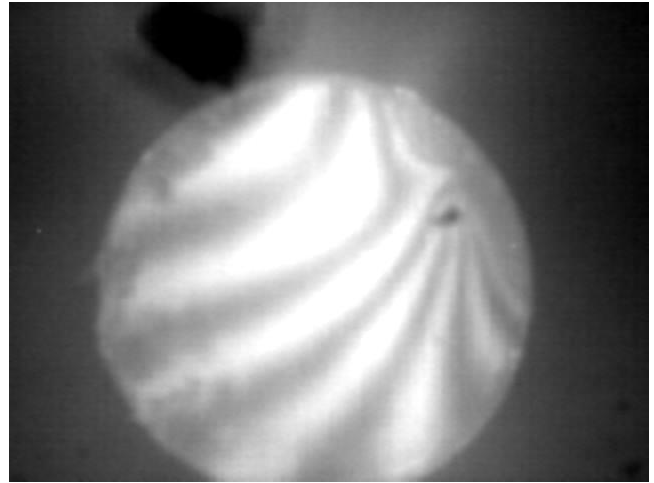


Cleave Angle: 0.19 deg.

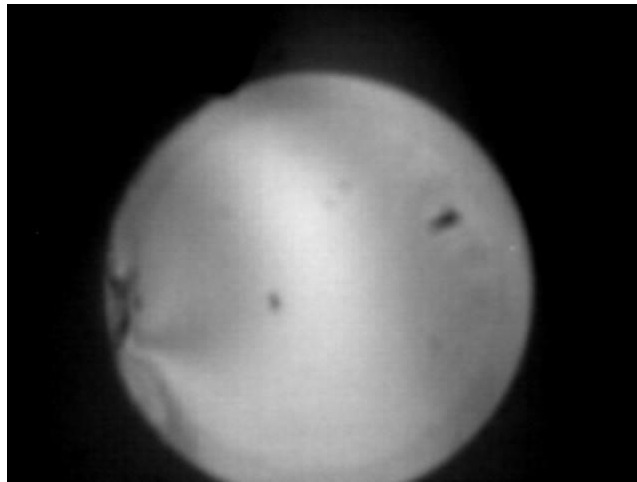
**Nufern MM-GDF-400/480: Multimode (MM), Passive- 480um Round Cladding**



Cleave Angle: 0.16 deg.



Cleave Angle: 0.22 deg.



Cleave Angle: 0.19 deg.

**Conclusion**

The 3SAE Technologies Liquid Clamp Cleaver LDF, provides low angle, LD fiber cleave angles with industry leading consistency. The performance of the LCC is consistent across large diameter fibers of various internal structures including Large Mode Area, Polarization Maintaining, Multimode and even octagonal shaped LD fibers.