

## Microfiber Worksheet 2 – Counting the Fibers

Here is all of the information our scientists collect about each textile or fabric.

Fabric 2 is: Polyester Jersey

<b>Supplier name</b>	<b>NA</b>	<b>Description</b>	<b>Hardface jersey with velour back</b>
<b>Yarn type</b>	Filament - textured	<b>Color</b>	Red
<b>Fiber Content</b>	90% virgin polyester, 10% elastane	<b>Chemical finishing</b>	DWR
<b>Fiber-end shape</b>	Flared & split	<b>Mechanical treatment</b>	Velour (brushed or sanded and sheared)
<b>Construction</b>	Circular Knit	<b>Composite</b>	None
<b>Dye method/Coloration</b>	Solid Dye - jet	<b>Weight (g/m<sup>2</sup>)</b>	223

### *Dimensions of fibers shed as a result of laundering*

<b>Fiber dimensions</b>	<b>Mean</b>	<b>Median</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Length, <math>\mu\text{m}</math></b>	612.7	641.9	196.3	1,355.0
<b>Width, <math>\mu\text{m}</math></b>	14.0	14.0	10.9	17.0

Turn to the next page to see microscopic images of the textile or fabric tested. Images show the new fabric at low and high magnification, there is also an image of the lint shed as a result of washing (image at the bottom).

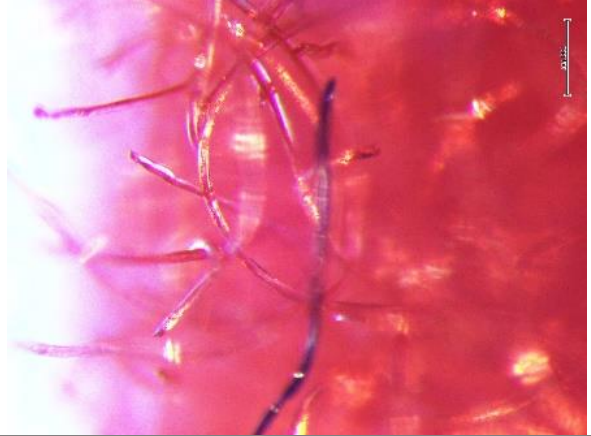
Again, note the scale bars for each image to give you an idea of the size of each fiber. Make sure you take a close look at the image of the lint from this fabric, that is the image that will help you decide which pieces to count on the squares following.

Microscopic images of the textile tested

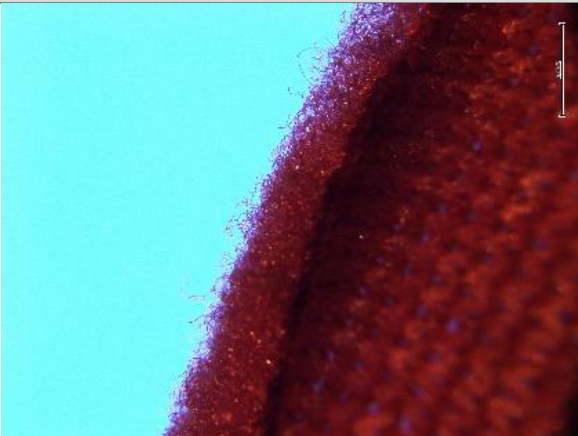
Textile side 1 wide view, scale bar 500  $\mu\text{m}$



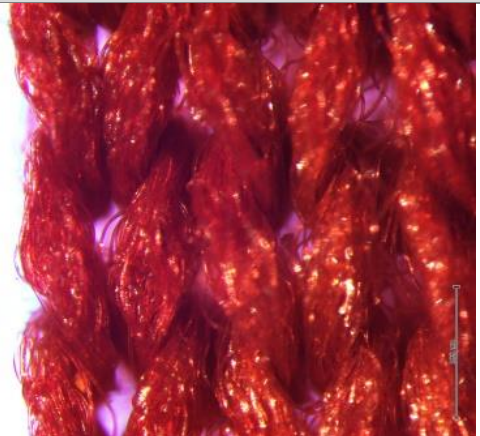
Textile side 1 detailed view, scale bar 100  $\mu\text{m}$



Textile edge, scale bar 2 mm



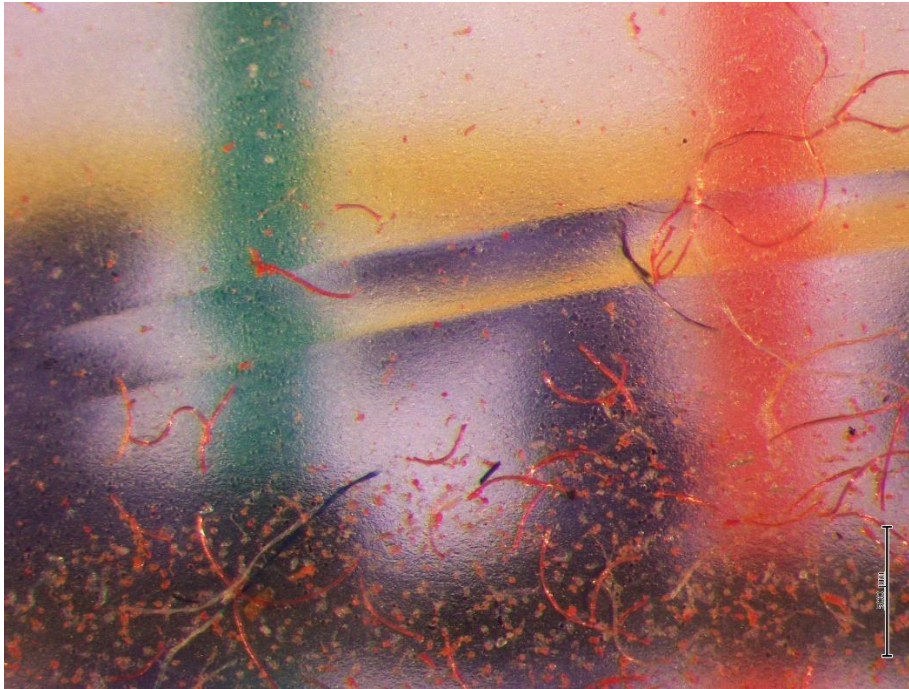
Textile side 2 wide view, scale bar 500  $\mu\text{m}$



Lint, scale bar 100  $\mu\text{m}$



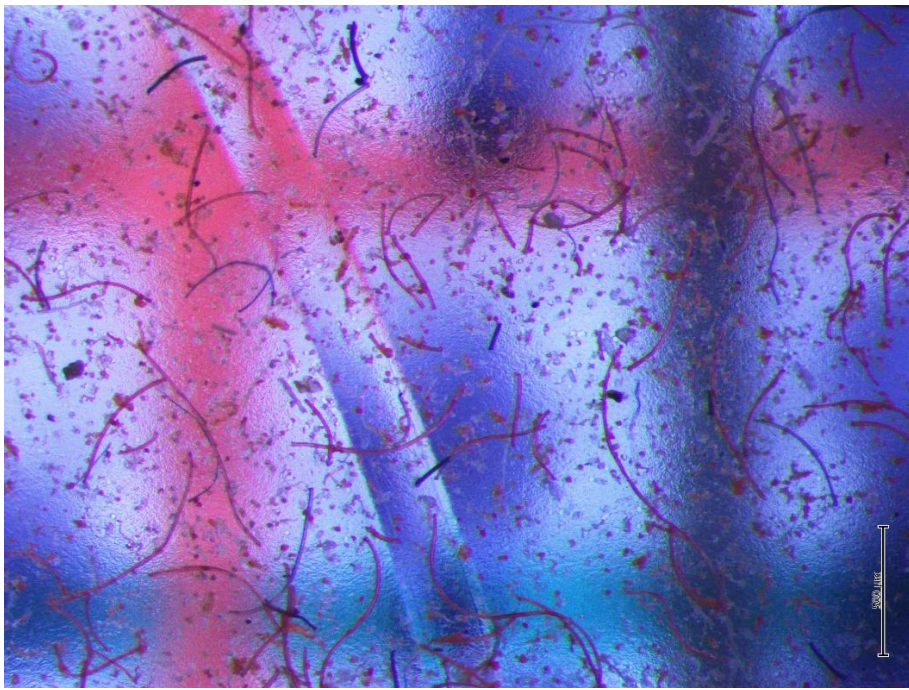
Square 1



Scale bar = 500 μm

How many fibers do you see? \_\_\_\_\_

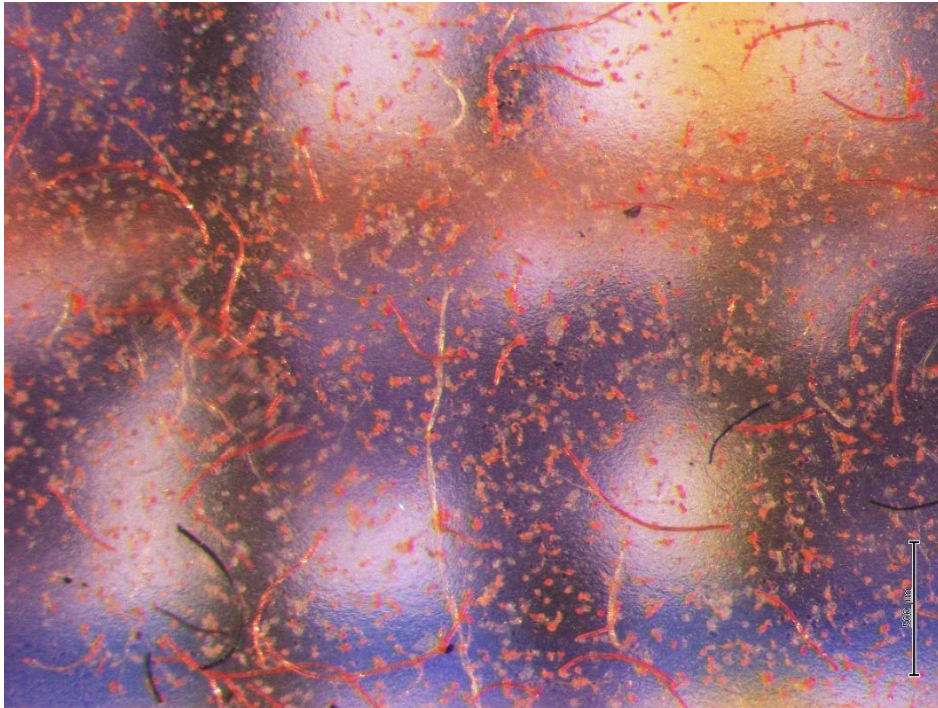
Square 2



Scale bar = 500 μm

How many fibers do you see? \_\_\_\_\_

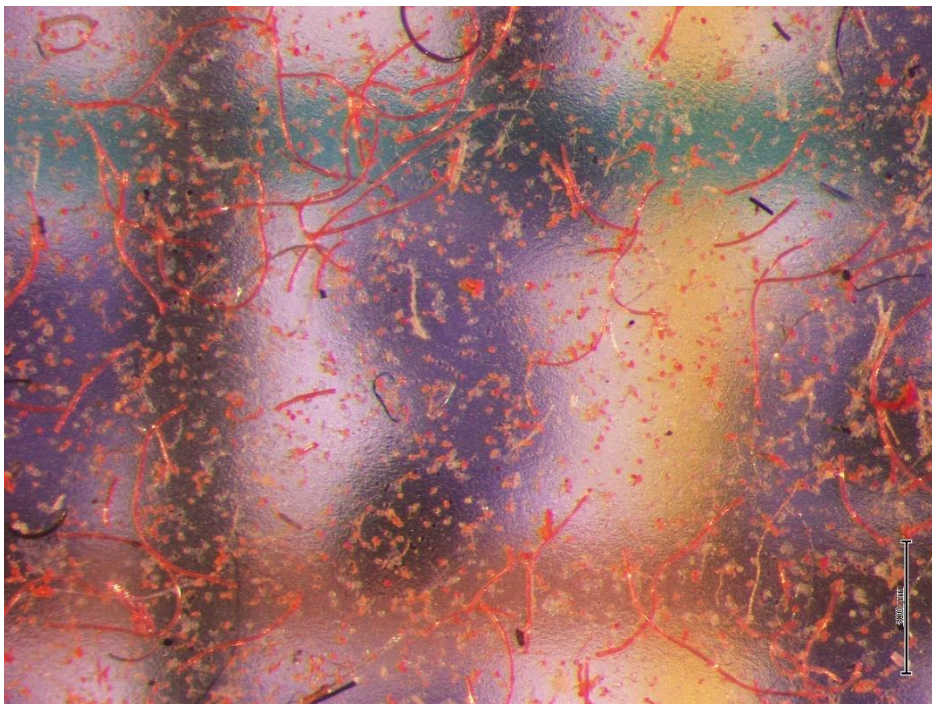
Square 3



Scale bar = 500  $\mu$ m

How many fibers did you count? \_\_\_\_\_

Square 4



Scale bar = 500  $\mu$ m

How many fibers did you count? \_\_\_\_\_

Now calculate the total number of fibers for this fabric sample:

Enter the number of fibers you counted in each grid below:

Square Number	1	2	3	4	Total
Number of fibers you counted					
Number of squares on grid					351
Calculate the average number of fibers per square (your total / 4)					
Calculate the number of fibers on filter (your average count x 351)					
Mass of fibers on filter, mg					0.6mg
Fibers/mg (total fibers on the filter / total mass of fibers)					

Knowing how many fibers your piece of fabric released in a single wash allows you to estimate how many fibers are released by that piece of fabric or garment over 5 washes, or 10 or 100 washes!

The number of fibers adds up quickly! Imagine how many times you wash each piece of clothing you own, now think about that number for everyone in your family, on your block, in your town or city, etc. for this fabric.