# Effect of Compression

To determine the following aspects:

Effects of compression time and force. It is now evident that correct formation of initial contact forms the base of the adhesion properties. Therefore, several experiments are conducted :

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| --- | --- | --- | --- |
| **Test:** | **Compression Force** | **Compression Time** | **Amount of samples** |
| 1 | 1 | 10 | 3 |
| 2 | 1 | 30 | 3 |
| 3 | 1 | 60 | 3 |
| 4 | 5 | 10 | 3 |
| 5 | 5 | 30 | 3 |
| 6 | 5 | 60 | 3 |
| 7 | 10 | 10 | 3 |
| 8 | 10 | 30 | 3 |
| 9 | 10 | 60 | 3 |

Constant parameters are:

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| --- | --- | --- |
| **Parameter** |  |  |
| Temperature | 340 | C |
| Compression Force | - | N |
| Compression Time | - | sec |
| Compression sample rate | 1 | Hz |
| Displacement rate | 0.05 | mm sec-1 |
| Displacement sample rate | 200 | Hz |
| Relaxation Time | 10 | Sec |
|  |  |  |
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## Test 1:

Date: 20220906

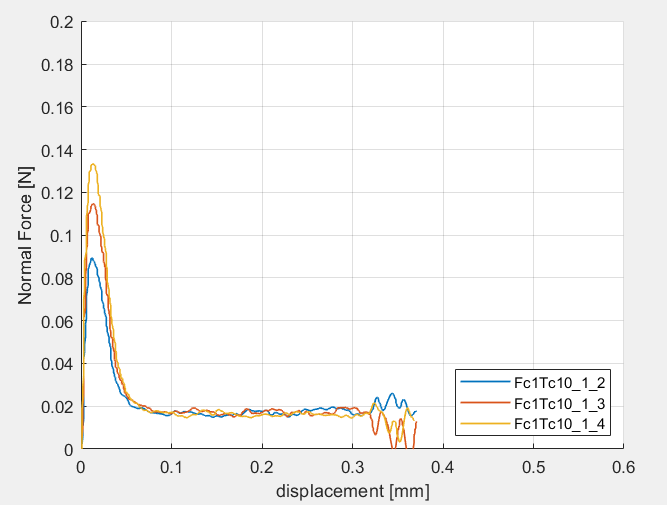
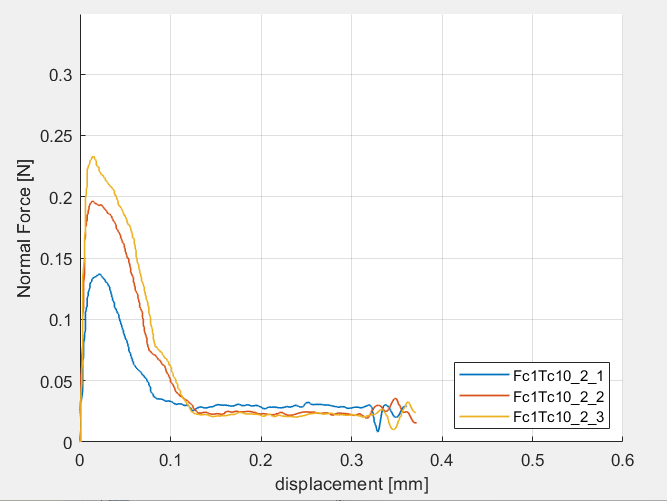
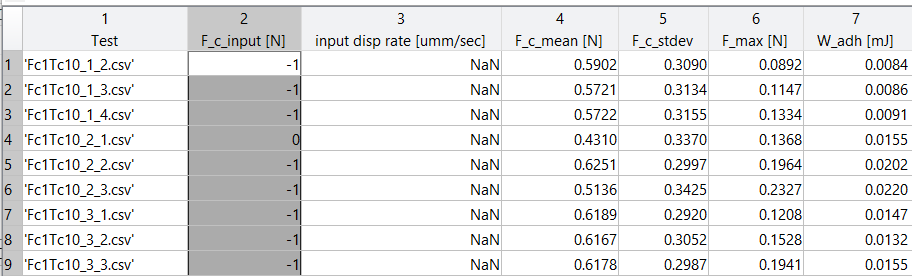
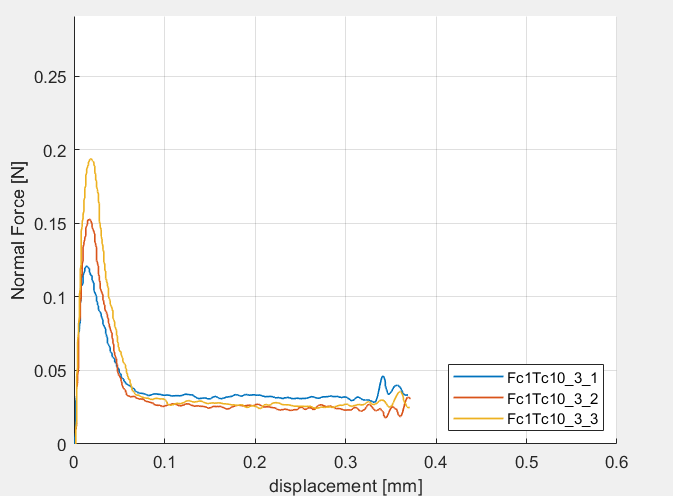
Analyse these tests with ‘Adhesion\_CompressionEffect.m’

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| --- | --- | --- |
| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc1Tc10\_1\_1 tm 4 | 20220901- 10  (CoConsolidated) | 20220901 -29  (CoConsolidated) |
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Fc1Tc10\_1\_1 was not carried out correctly. The rheometer controller was not quick enough to reach the 1N setpoint within 10 seconds. Therefore, for tests 2,3 & 4, compression time was set to 20 sec. This meant the actual compression time did take 10 seconds.

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| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc1Tc10\_2\_1 tm 3 | 20220901 - 47  (CoConsolidated) | 20220901 -56  (CoConsolidated) |
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| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc1Tc10\_3\_1 tm 3 | 20220901 - 55  (CoConsolidated) | 20220901 -33  (CoConsolidated) |
|  |  |  |

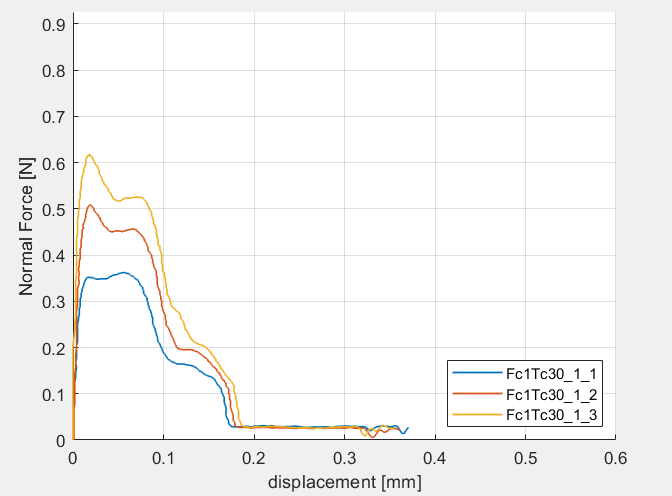
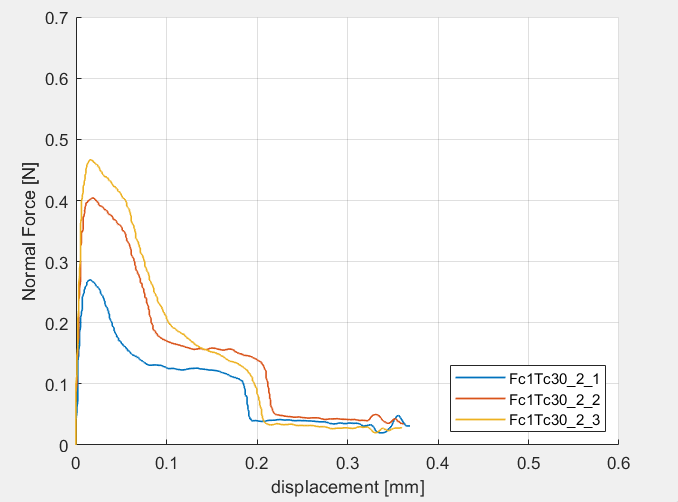
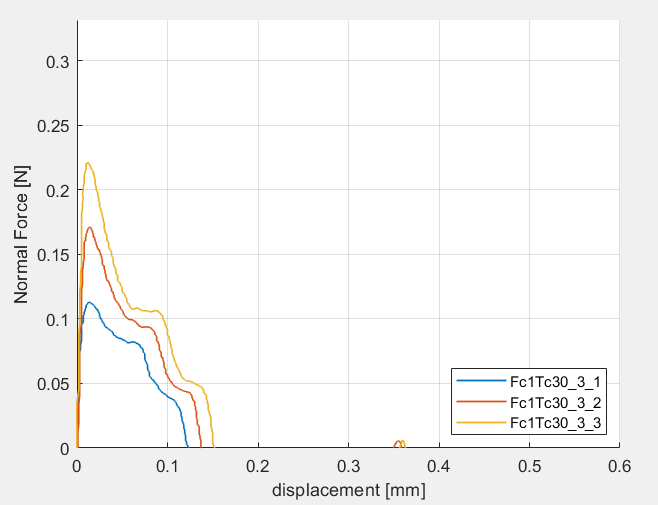
## Test 2:

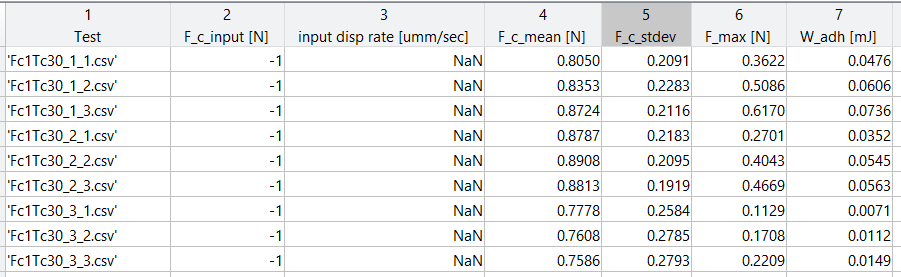
Date: 20220906

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| --- | --- | --- |
| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc1Tc30\_1\_1 tm 3 | 20220901- 35  (CoConsolidated) | 20220901 -40  (CoConsolidated) |
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| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc1Tc30\_2\_1 tm 3 | 20220901 - 14  (CoConsolidated) | 20220901 -24  (CoConsolidated) |
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| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc1Tc30\_3\_1 tm 3 | 20220905 - 56  (CoConsolidated) | 20220905 -40  (CoConsolidated) |
|  |  |  |



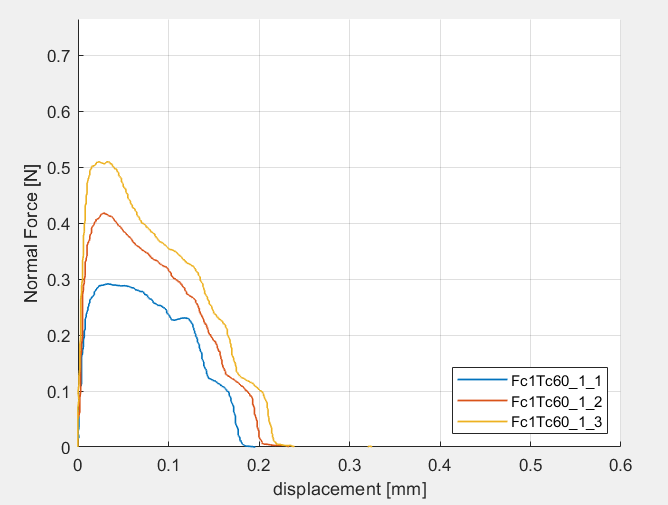
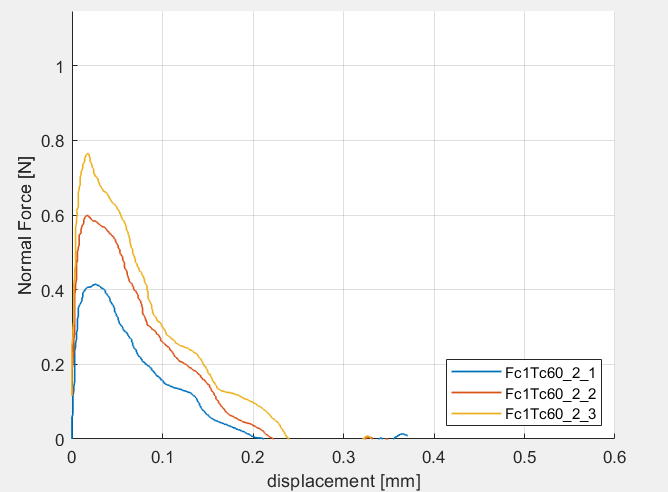
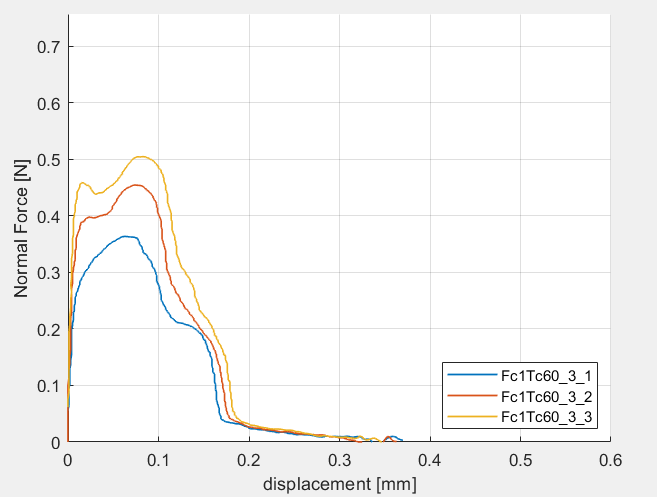
## Test 3:

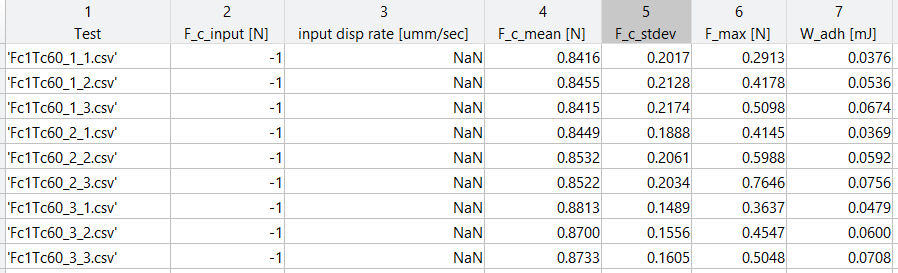
Date: 20220906

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| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc1Tc60\_1\_1 tm 3 | 20220905- 10  (CoConsolidated) | 20220905 - 55  (CoConsolidated) |
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| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc1Tc60\_2\_1 tm 3 | 20220905 – 41  (CoConsolidated) | 20220905 - 47  (CoConsolidated) |
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| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc1Tc60\_3\_1 tm 3 | 20220905 - 25  (CoConsolidated) | 20220905 - 64  (CoConsolidated) |
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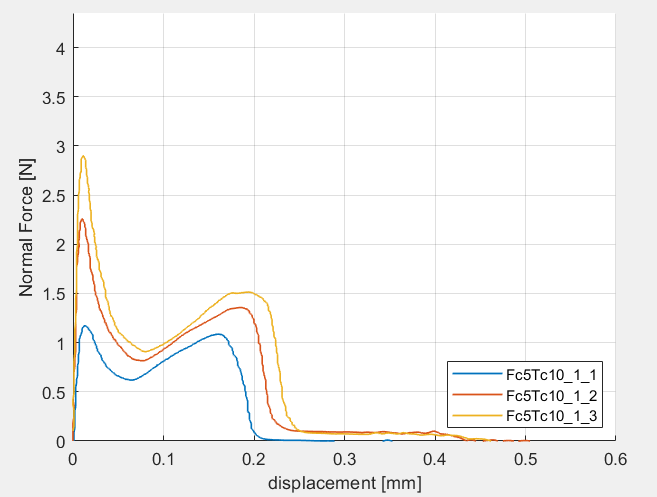
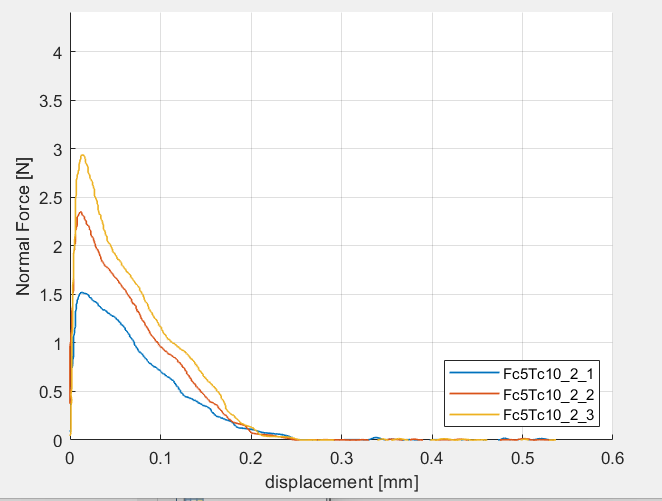
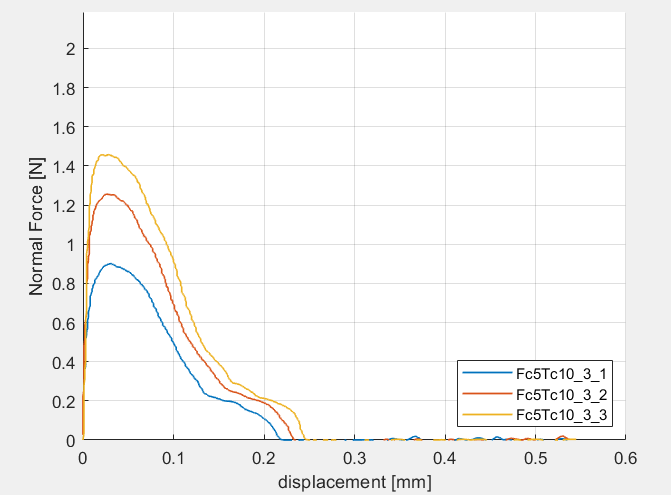
## Test 4:

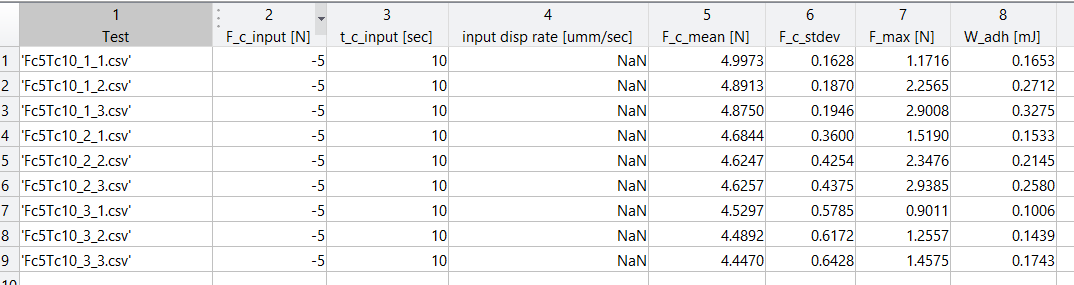
Date: 20220908

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| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc10\_1\_1 tm 3 | 20220905- 60  (CoConsolidated) | 20220905 – 42  (CoConsolidated) |
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| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc10\_2\_1 tm 3 | 20220905 – 54  (CoConsolidated) | 20220905 - 33  (CoConsolidated) |
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| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc10\_3\_1 tm 3 | 20220905 - 62  (CoConsolidated) | 20220905 - 12  (CoConsolidated) |
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## Test 5:

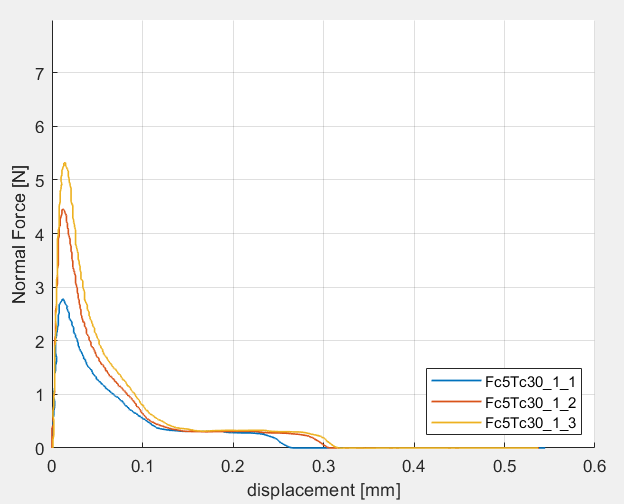
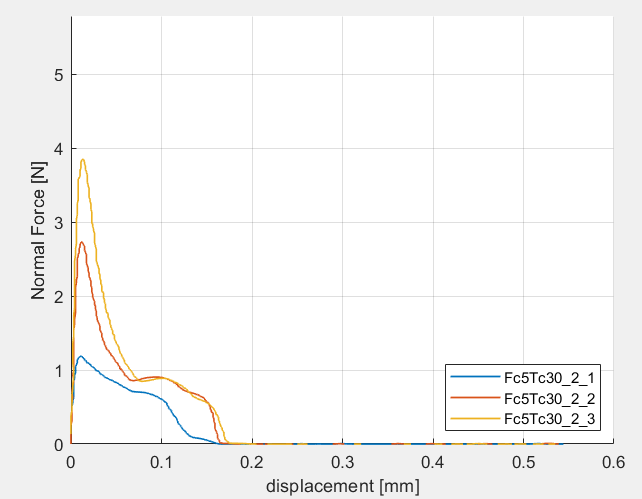
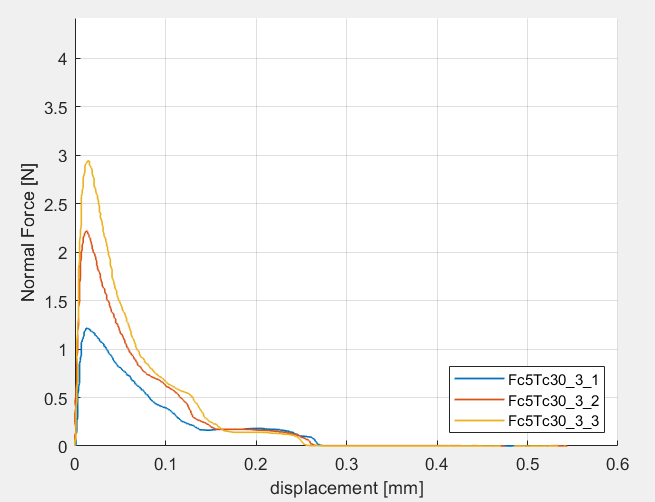
Date: 20220908

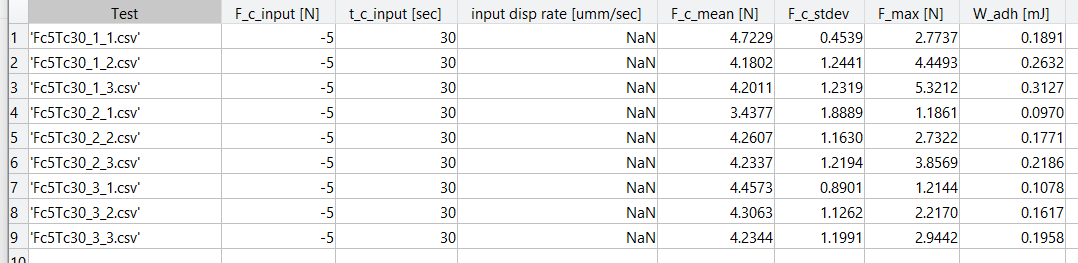
|  |  |  |
| --- | --- | --- |
| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc30\_1\_1 tm 3 | 20220907 -20  (CoConsolidated) | 20220907 – 54  (CoConsolidated) |
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Temperature dropped during 2nd test to approximately 333 degrees C

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| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc30\_2\_1 tm 3 | 20220907 – 13  (CoConsolidated) | 20220907 – 37  (CoConsolidated) |
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| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc30\_3\_1 tm 3 | 20220907 - 28  (CoConsolidated) | 20220907 - 4  (CoConsolidated) |
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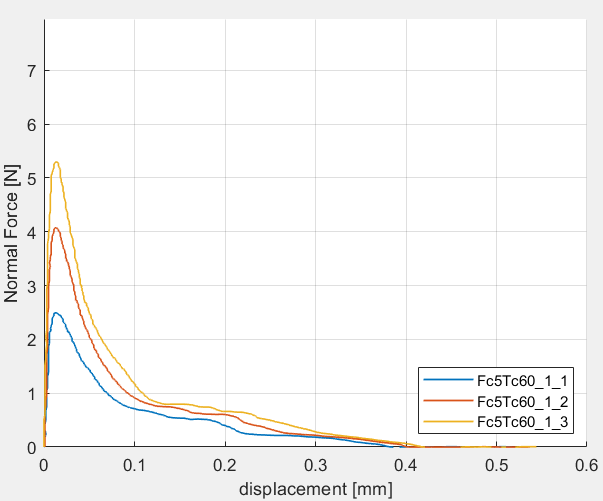
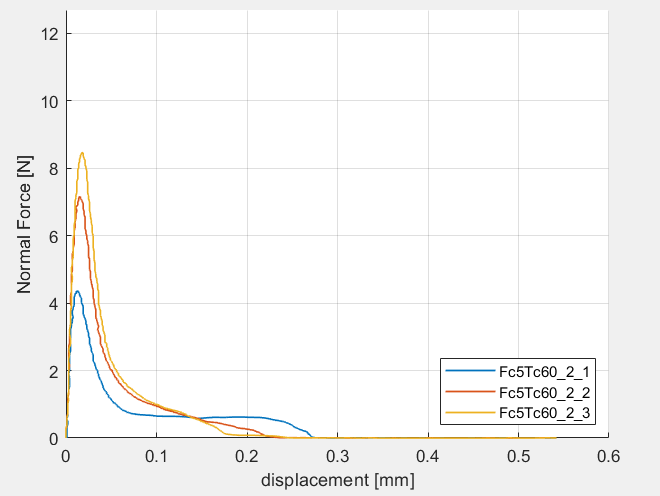
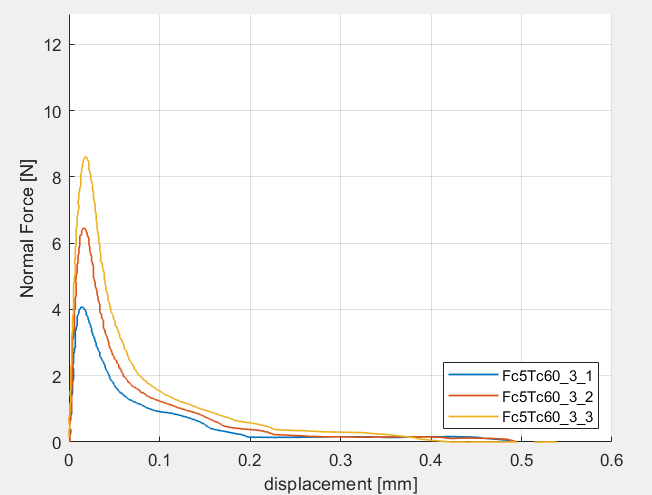
## Test 6:

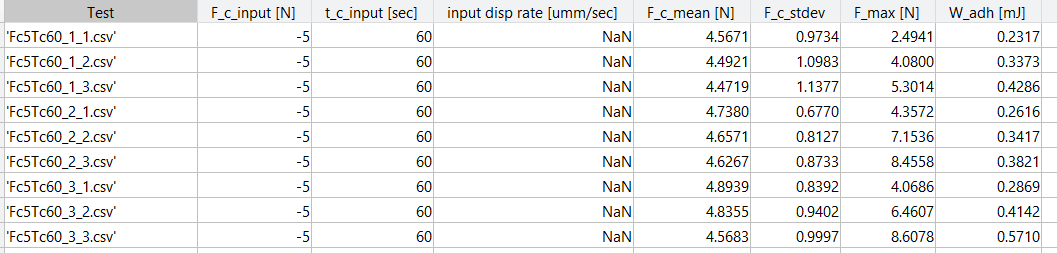
Date: 20220908

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| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc60\_1\_1 tm 3 | 20220907- 53  (CoConsolidated) | 20220907 – 63  (CoConsolidated) |
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| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc60\_2\_1 tm 3 | 20220907 – 17  (CoConsolidated) | 20220907 - 46  (CoConsolidated) |
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| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc60\_3\_1 tm 3 | 20220907 - 21  (CoConsolidated) | 20220907 - 38  (CoConsolidated) |
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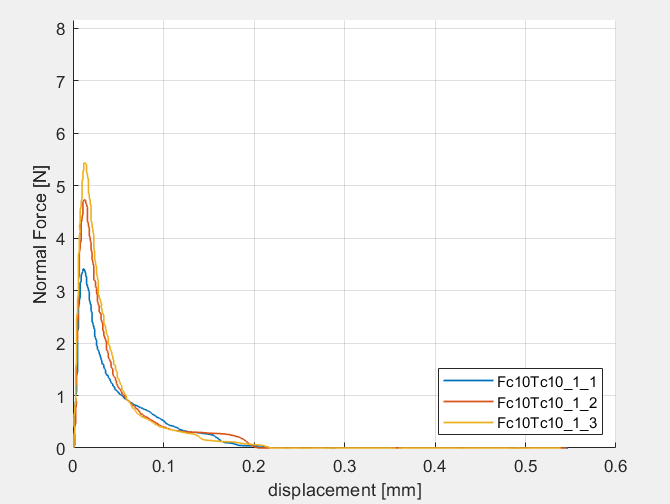
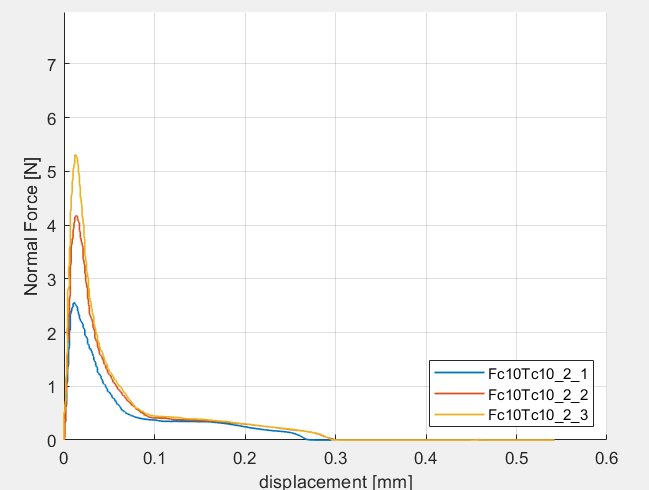
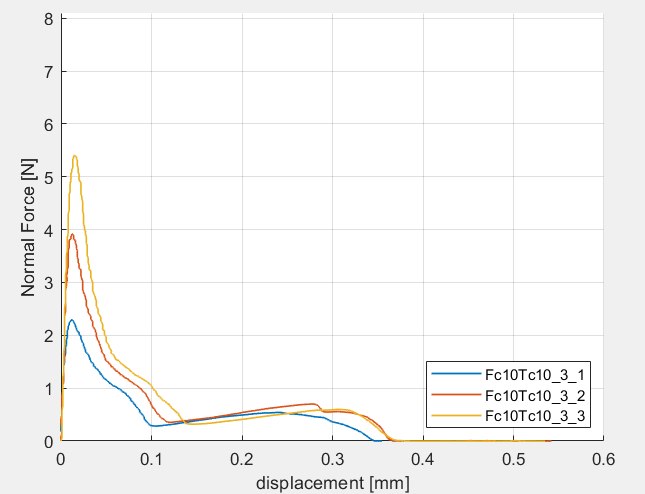
## Test 7:

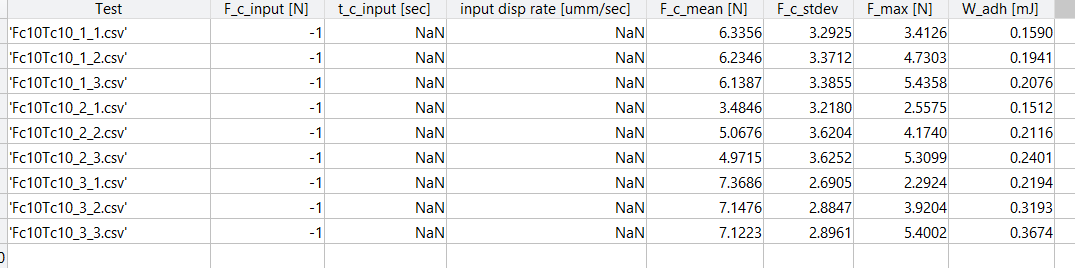
Date: 20220909

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| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc10Tc10\_1\_1 tm 3 | 20220907- 59  (CoConsolidated) | 20220907 – 30  (CoConsolidated) |
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| --- | --- | --- |
| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc10Tc10\_2\_1 tm 3 | 20220907 – 48  (CoConsolidated) | 20220907 - 9  (CoConsolidated) |
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| --- | --- | --- |
| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc10Tc10\_3\_1 tm 3 | 20220907 - 2  (CoConsolidated) | 20220907 -19  (CoConsolidated) |
|  |  |  |



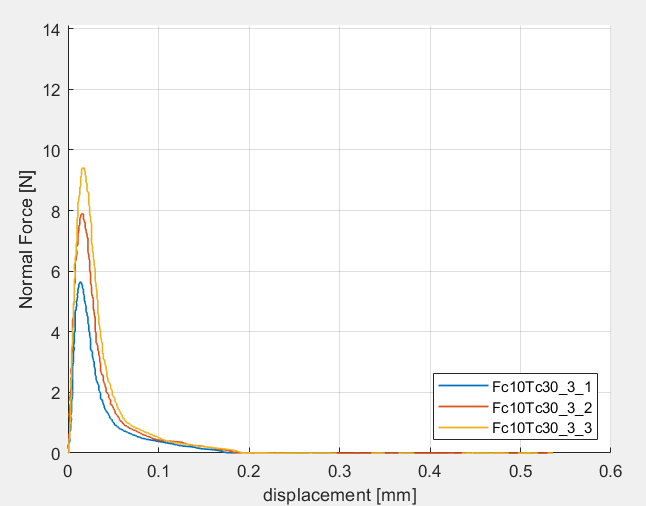
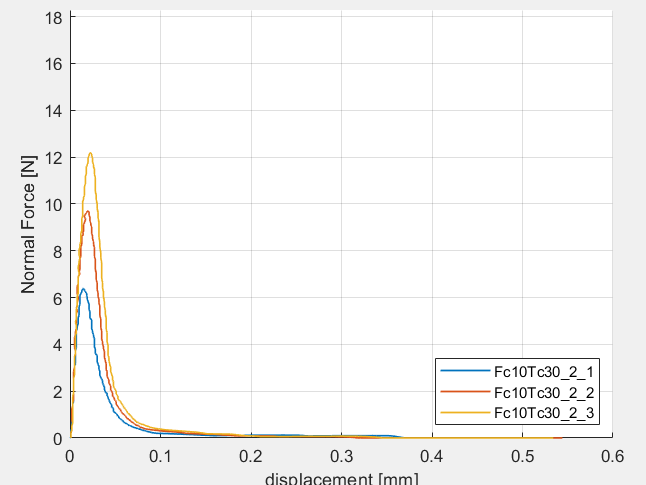
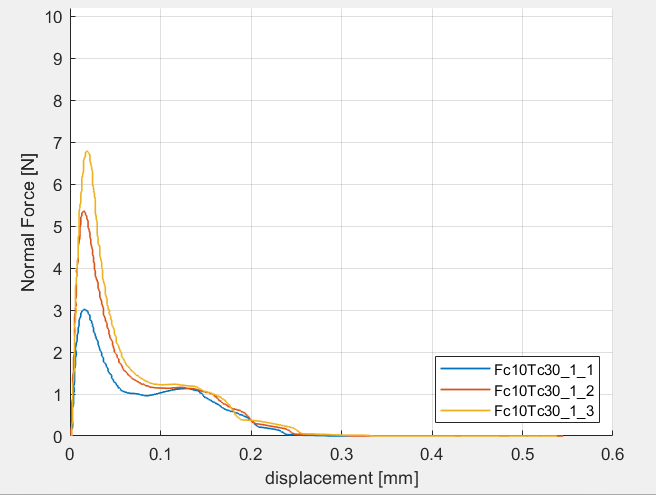
## Test 8:

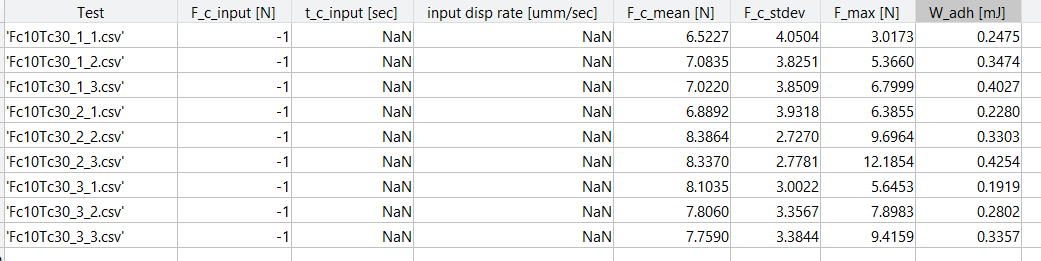
Date: 20220909

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| --- | --- | --- |
| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc10Tc30\_1\_1 tm 3 | 20220907- 61  (CoConsolidated) | 20220907 – 29  (CoConsolidated) |
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| --- | --- | --- |
| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc10Tc30\_2\_1 tm 3 | 20220907 – 43  (CoConsolidated) | 20220907 - 22  (CoConsolidated) |
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| --- | --- | --- |
| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc10Tc30\_3\_1 tm 3 | 20220907 - 3  (CoConsolidated) | 20220907 -6  (CoConsolidated) |
|  |  |  |





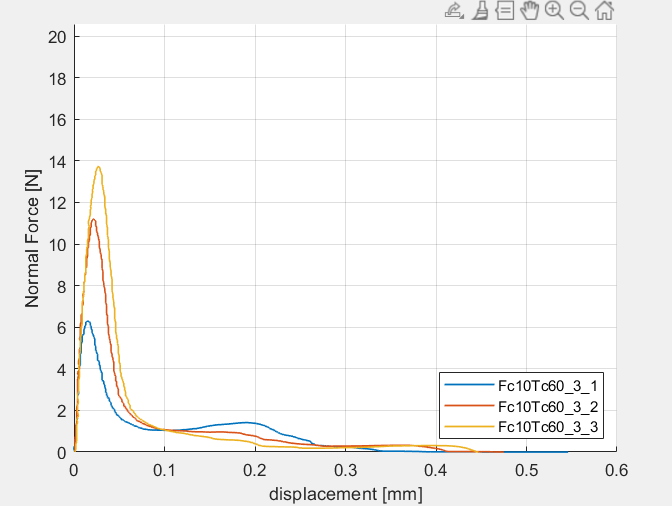
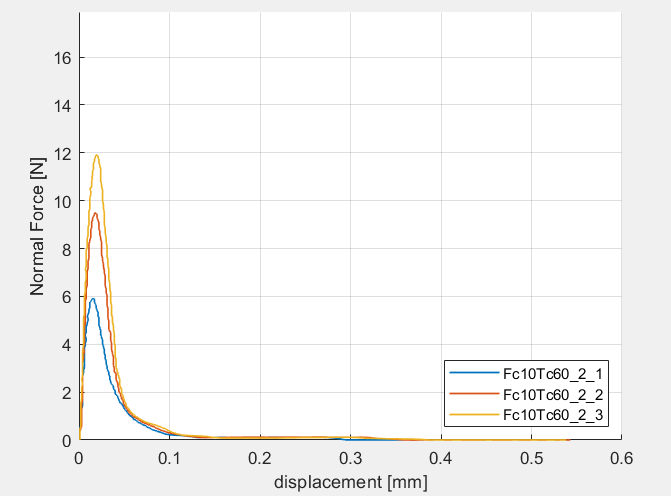
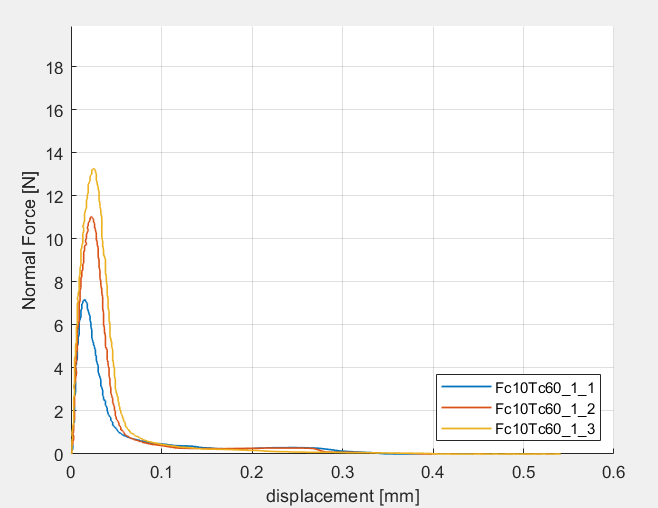
## Test 9:

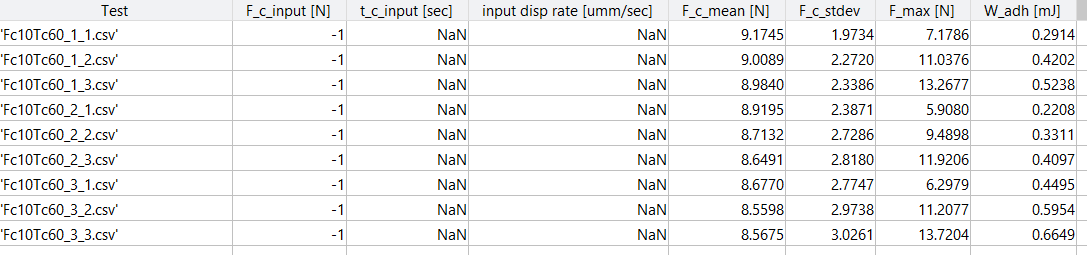
Date: 20220909

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| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc10Tc60\_1\_1 tm 3 | 20220907- 27  (CoConsolidated) | 20220907 – 26  (CoConsolidated) |
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| --- | --- | --- |
| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc10Tc60\_2\_1 tm 3 | 20220907 – 39  (CoConsolidated) | 20220907 - 11  (CoConsolidated) |
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| --- | --- | --- |
| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc10Tc60\_3\_1 tm 3 | 20220907 - 44  (CoConsolidated) | 20220907 -45  (CoConsolidated) |
|  |  |  |





## Test 10:

Date: 20220927

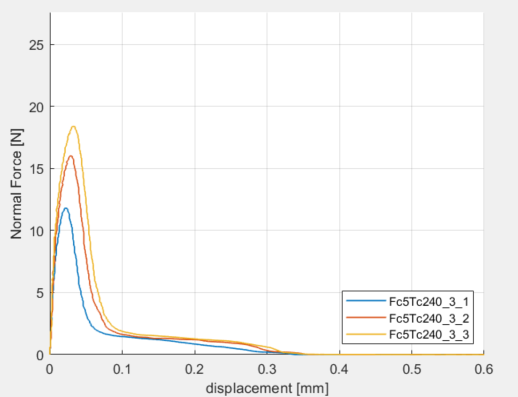
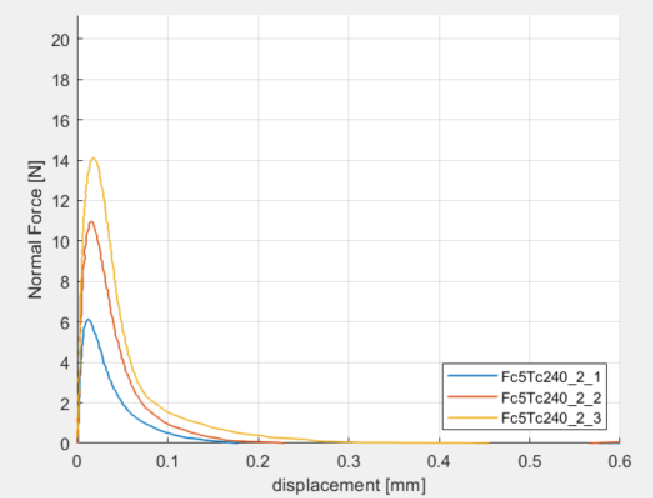
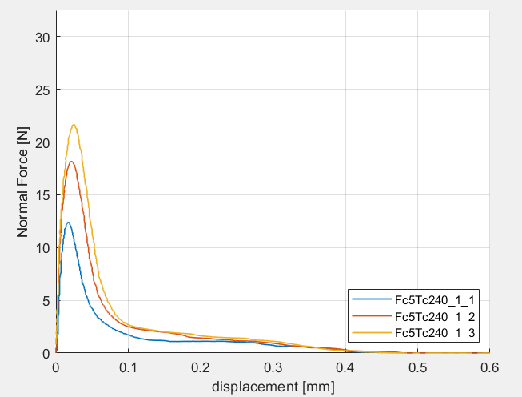
Tests 10 and 11 were later carried out with 5N of compression force and higher compression times (240 and 480 sec).

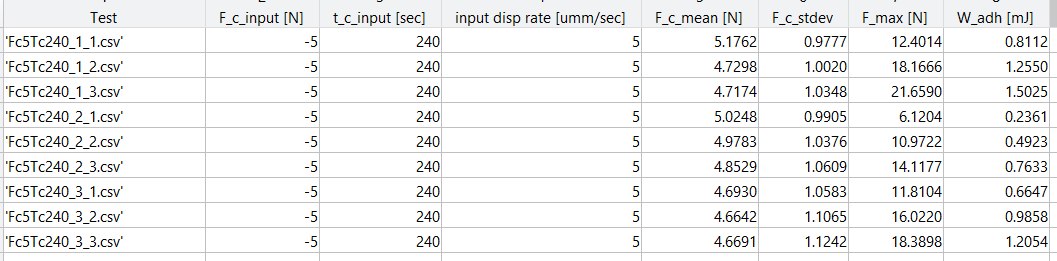
NOTE: Analyze these tests with ‘Adhesion\_CompressionEffect\_v2’!!

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| --- | --- | --- |
| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc240\_1\_1 tm 3 | 20220926 - 10  (CoConsolidated) | 20220926 - 21  (CoConsolidated) |
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| --- | --- | --- |
| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc240\_2\_1 tm 3 | 20220926 - 16  (CoConsolidated) | 20220926 - 20  (CoConsolidated) |
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| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc240\_3\_1 tm 3 | 20220926 - 13  (CoConsolidated) | 20220926 - 19  (CoConsolidated) |
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## Test 11:

Date: 20220927

Tests 10 and 11 were later carried out with 5N of compression force and higher compression times (240 and 480 sec).

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| **Set 1:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc480\_1\_1 tm 3 | 20220926 - 17  (CoConsolidated) | 20220926 - 25  (CoConsolidated) |
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| **Set 2:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc480\_2\_1 tm 3 | 20220926 - 27  (CoConsolidated) | 20220926 - 22  (CoConsolidated) |
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| --- | --- | --- |
| **Set 3:** | **Specimen on top** | **Specimen on bottom** |
| Fc5Tc480\_3\_1 tm 3 | 20220926 – 12  (CoConsolidated) | 20220926 - 24  (CoConsolidated) |
|  |  |  |

