

DAFTAR PUSTAKA

- Abdulatif, OM dan Cruden, DM., (1983), The relationship between rock mass quality and ease of excavation, Bulletin International Association of Engineering Geology.
- Akingboye, A.S., and Bery, A.A., (2022), Characteristics and Rippability Conditions of Near-Surface Lithologic Units (penang island, malaysia) Derived From Multimethod Geotomographic Models and Geostatistics. Journal of Applied Geophysics, VOLUME 204.
- Asof, M., Susilo, B.K. and Gofar, N., (2014), Evaluation of Factors Affecting Ripping Productivity in Open Pit Mining Excavation, European Journal of Government and Economics, Vol. 19.
- Avchar, A., Choudhary, B.S., Budi, G. and Sawaiker, U.G., (2018) Effect of rock properties on rippability of laterite in Iron Ore mines of Goa, International Information and Engineering Technology Association, Vol 5, No. 2.
- Basarir, H dan Karpuz, C., (2004), A rippability classification system for marls in lignite mines, Journal of Engineering Geology.
- Bineawski, Z.T., (1973), Engineering rock Mass classification; a complete manual for engineer and geologist in mining, civil and petroleum engineering, Jhon Wiley & Sons, Inc, Canada.
- Broch, E. and Franklin, J.A., (1972). The Point-Load Strength Test. International Journal Rock Mechanis, Pergamon Press, Great Britain.
- Caterpillar, T.C., (2001), Caterpillar performace Handbook, Illinois, Pretoria.
- Dzakir, La Ode., (2022). “Studi Kemampugalian dan Kemampugaruan Pada Penambangan Batu Gamping Di Desa Kokapi, Kecamatan Sawa, Konawe Utara”. Mining Science and Technology Journal (M I N E T E C H J O U R N A L) Vol 1, No 1 .
- Franklin, J.A., Broch, E., Walton, G., (1971). Logging the mechanical character of rock. Transactions of the Institution of Mining and Metallurgy.
- Hoek, E., and Brown, E.T., (1980). Empirical Strength Criterion for Rock Masses. Journal of the Geotechnical Engineering Division: Proceedings of American Society of Civil Engineers.
- Hoek, E., (2007). Practical Rock Engineering. s.l,RockScience
- Hoek, E., Brown, E.T., (2018). The Hoek-Brown failure criterion and GSI 2018 edition. Journal of Rock Mechanics and Geotechnical Engineering.

- Indonesianto. Y., (2014). Pemindahan Tanah Mekanis. Yogyakarta: Program Studi Teknik Pertambangan, UPN "Veteran" Yogyakarta.
- Ismail, M. A. M., Kumar, N. S., Abidin, M. H. Z., & Madun, A. (2018). Rippability Assessment of Weathered Sedimentary Rock Mass using Seismic Refraction Methods. *Journal of Physics: Conference Series*, 995(1).
- Komatsu, (2009). *Komatsu Specifications and Application Handbook*, Edition 30. Komatsu Ltd., Akasaka, Minato-ku, Tokyo, Japan.
- Kurniawan, Wahyu., Heriyadi, Bambang., (2018). "Analisis Metode Pemberaian Batuan Berdasarkan Kriteria Indeks Kekuatan Batu di Site Penambangan Batu DolomitePT. Bakapindo, Jorong Durian, Nagari Kamang Mudiak, Kecamatan Kamang Magek, Kabupaten Agam, Provinsi Sumatera Barat" *Jurnal Bina Tambang*, Vol. 3 No.3.
- Maryanto, S., Rachmansjah, Sihombing, T., dan Wiryosujono, S., 2005. Sedimentologi Batuan Pembawa Batubara Formasi Lati di Lintasan Lati, Berau, Kalimantan Timur. *Jurnal Sumber Daya Geologi*.
- Paettifier, G.S., dan Fookes, P.G., (1994), A Revision of the graphical method for assessing the excavatability of rock, *Quarterly Journal of Engineering Geology*.
- Purwanto, Muhaimin, A, Djamaluddin, Husain, R, Busthan, A., (2017), Pengaruh Derajat Pelapukan Terhadap Kekuatan Batuan Pada Batuan Basal, *Prosiding Seminar Nasional Teknologi IV, Samarinda*
- Rachmansjah, Wiryosujono, S., Sihombing, T., dan Maryanto, S., (2003). Stratigrafi dan Sedimentologi Cekungan Batubara Tarakan, Kalimantan Timur. *Laporan Teknis Intern, Pusat Penelitian dan Pengembangan Geologi, Bandung*.
- Recsalog, (2020), *Laporan Akhir Survey Seismik Refraksi di Site Parapatan, Berau Kalimantan Timur*
- Sadisun, I. S., (1998). Pengaruh Perubahan Derajat Pelapukan Batuan Terhadap Beberapa Karakter Perubahan Sifat Keteknikan Batuan; Studi Kasus Pada Batulempung Formasi Subang. *Prosiding Seminar Geoteknik di Indonesia Menjelang Milenium ke-3, Jurusan Teknik Sipil, Institut Teknologi Bandung*
- Singh, Bhawani dan Goel, R. K., (2011), *Engineering rock Mass classification*, London: British Library
- Situmorang, R. L. dan Burhan, G., (1995). *Peta Geologi Lembar Tanjungredeb, Kalimantan. Pusat Penelitian dan Pengembangan Geologi, Bandung*.

- Sukandarrumidi., (2006). Batubara dan Pemanfaatannya: Pengantar Teknologi Batubara Menuju Lingkungan Bersih. Gajah Mada University Press. Yogyakarta.
- Suparmanto, E.K., Mohamad, E.T., Muztaza, N.M., Zaina, Z., Zainuddin, N.E dan Slamet, F., (2023) Rippability Assessment Of Weathered Granite Rock Mass Using Seismic Velocity And Graphical Method, Research Square.
- Tossin, S. dan Kadir, R., (1996). Tipe Reservoir Sedimen Miosen Tengah di Sub-Cekungan Tarakan, Cekungan Tarakan, Kalimantan Timur. Proceeding of the 25th Annual Convention of The Indonesian Association of Geologist.
- Weaver, J. M., (1975), Geological factors significant in the assessment of rippability, Civil Engineering In South Africa
- Wesley, L.D., (2010) Mekanika Tanah, untuk tanah endapan dan residu. Jakarta.
- Yousif, L.D., (2021), Excavatability Assessment For The Eocene Carbonate Rocks Around Al-Salman Depression, South Iraq, Iraqi Bulletin of Geology and Mining, Vol 17.

Lampiran – Lampiran

1. Hasil tes laboratorium kuat tekan batuan DDGT-PRP-20-02
2. Hasil tes laboratorium kuat tekan batuan DDGT-PRP-20-03
3. Hasil tes laboratorium kuat tekan batuan DDGT-PRP-20-04
4. Hasil tes laboratorium kuat tekan batuan DDGT-PRP-20-15



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-01
 Depth (m) : 3.60-3.75
 Lithology : Mudstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
60,73	150,53	974,4	2896,7

Load (Kn) : 13.35

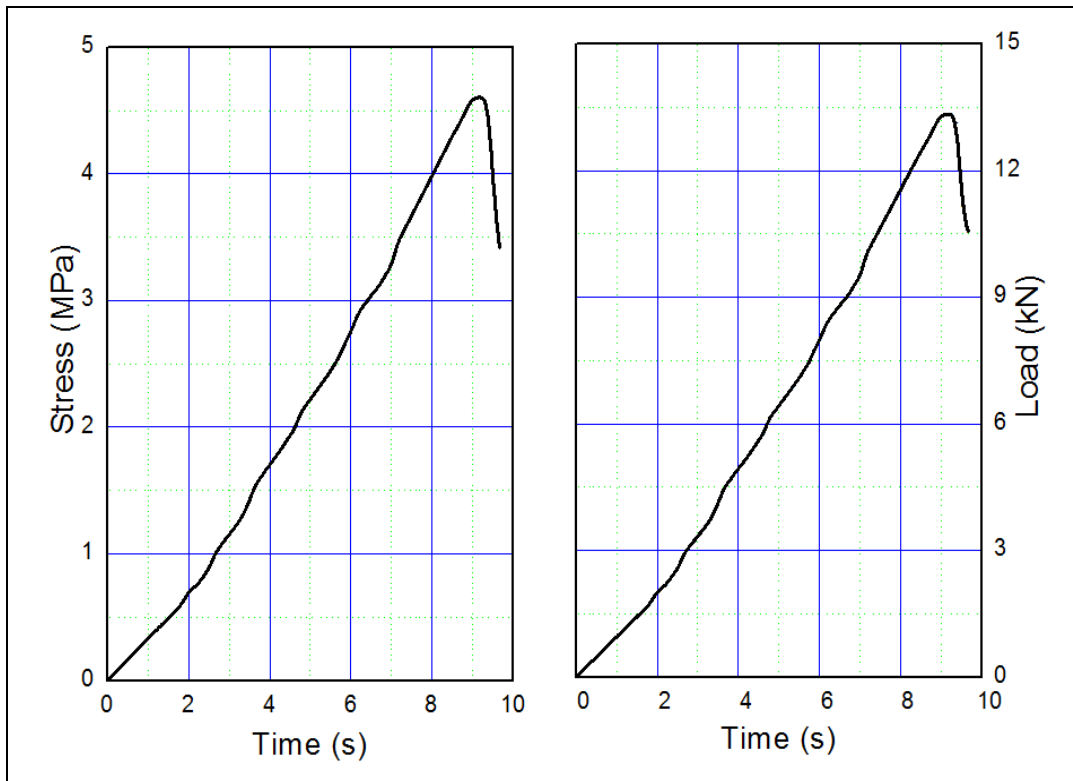
σ_c (Mpa) : 4.61

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-02
 Depth (m) : 7.50-7.65
 Lithology : Sandstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
60,93	150,87	999,6	2915,8

Load (Kn) : 20.38

σ_c (Mpa) : 6.99

Remark :

* σ_c : Compressive strength

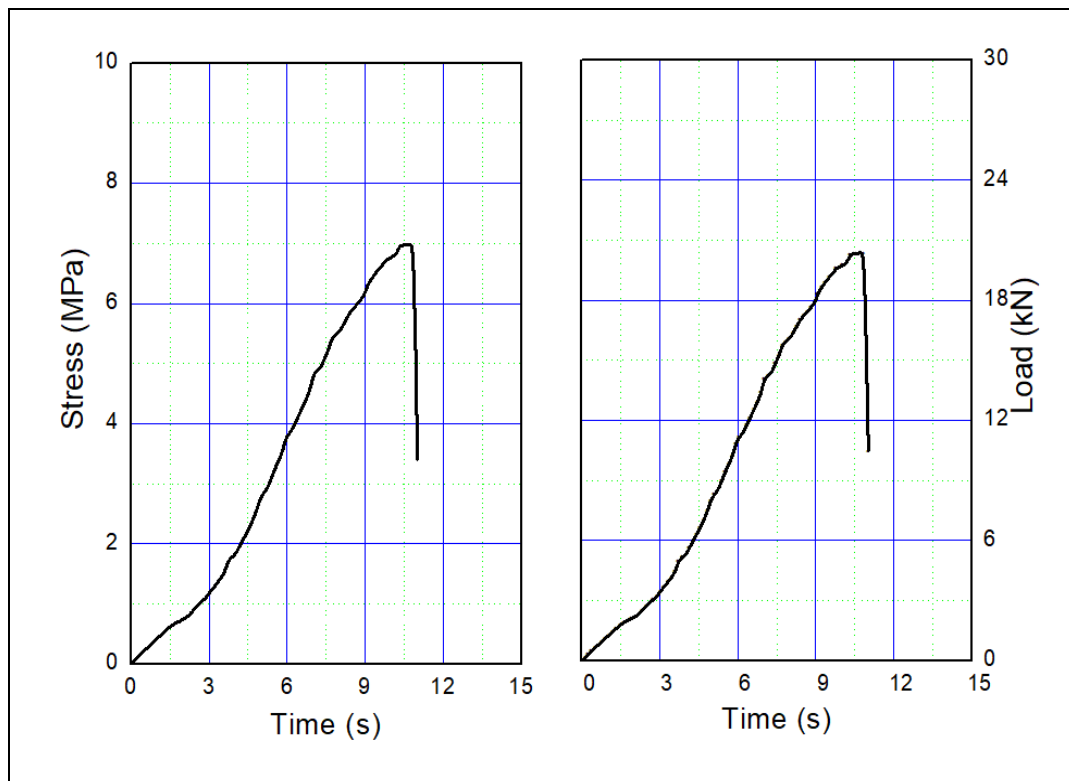
Before



After



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-03
 Depth (m) : 18.00-18.15
 Lithology : Interlaminated Mudstone and Sandstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

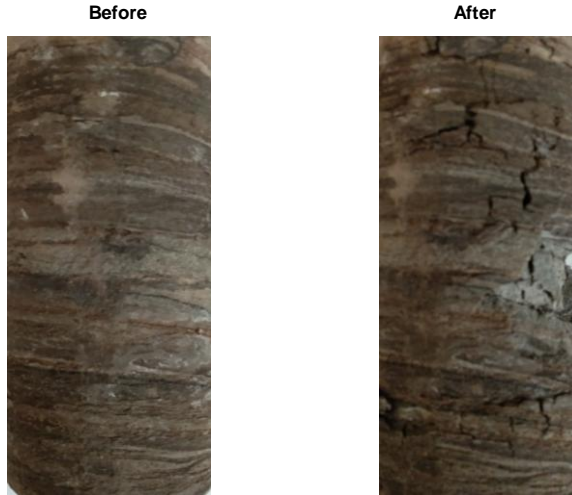
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
60,01	150,64	984,7	2828,4

Load (Kn) : 15.46

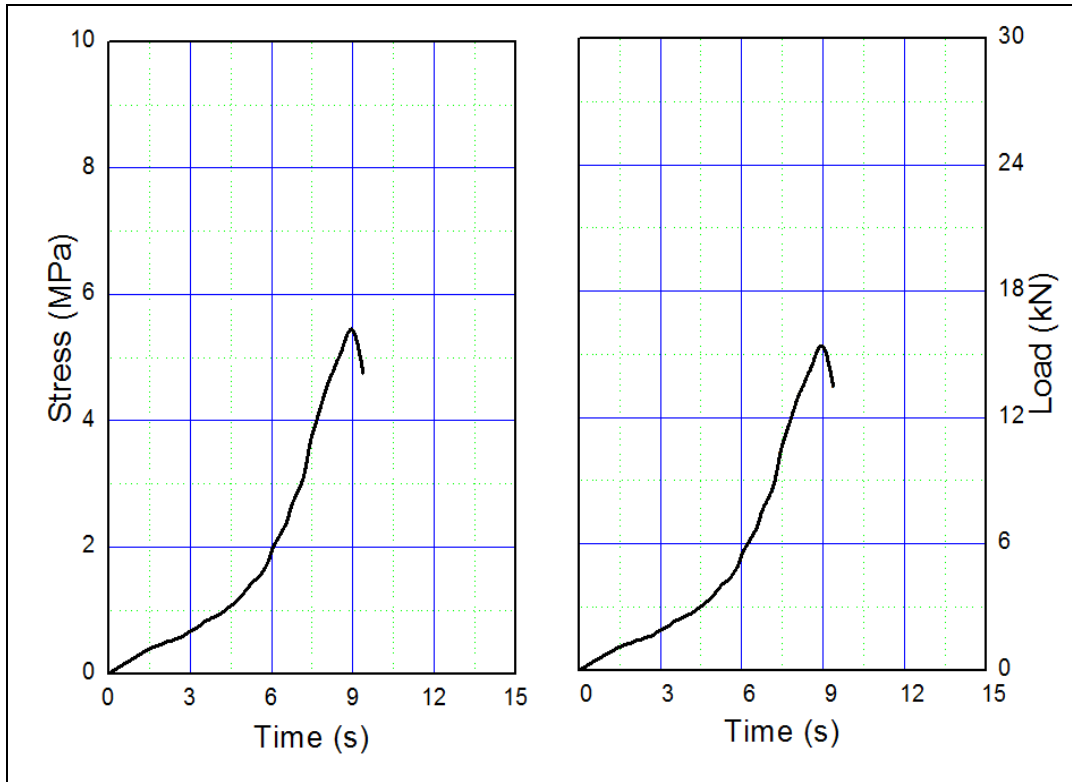
σ_c (Mpa) : 5.47

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-04
 Depth (m) : 46.65-46.80
 Lithology : Mudstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

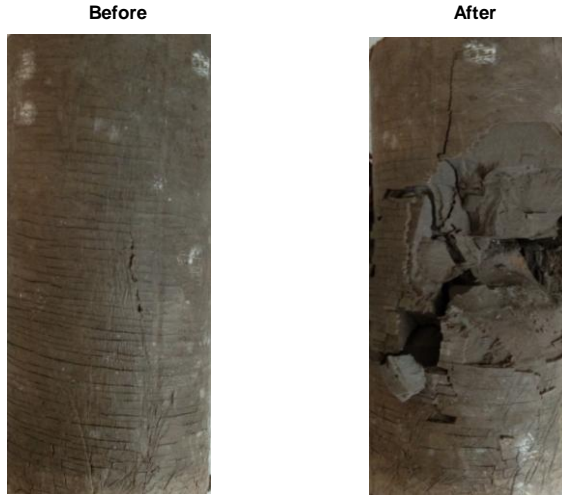
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,98	150,24	1061,0	3017,1

Load (Kn) : 5.50

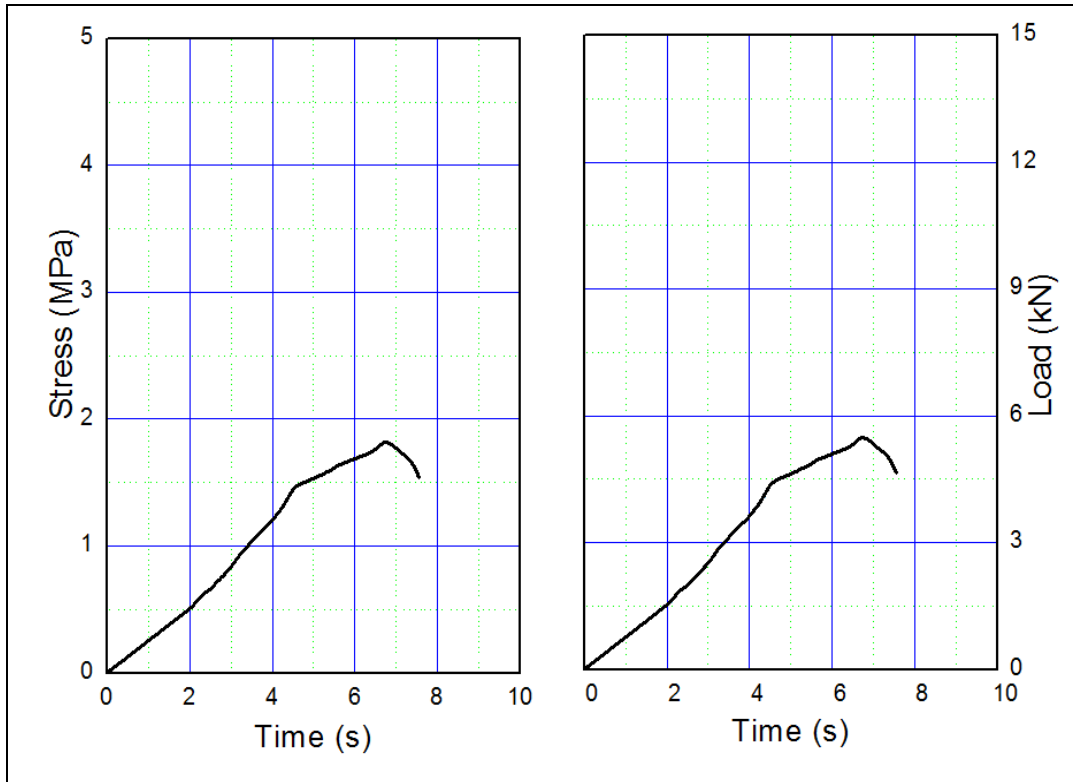
σ_c (Mpa) : 1.82

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-05
 Depth (m) : 47.65-47.80
 Lithology : Mudstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,23	150,48	1062,5	3041,5

Load (Kn) : 4.78

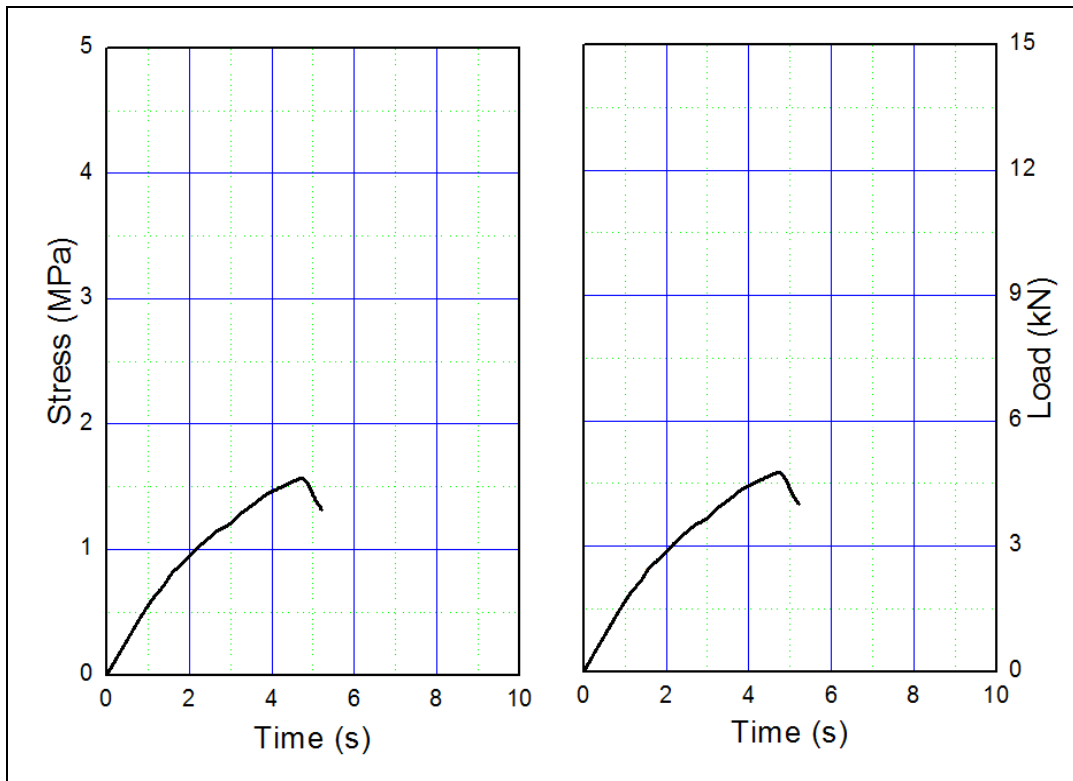
σ_c (Mpa) : 1.57

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-06
 Depth (m) : 57.50-57.65
 Lithology : Sandy Mudstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
60,30	150,89	1066,4	2855,8

Load (Kn) : 51.90

σ_c (Mpa) : 18.17

Remark :

* σ_c : Compressive strength

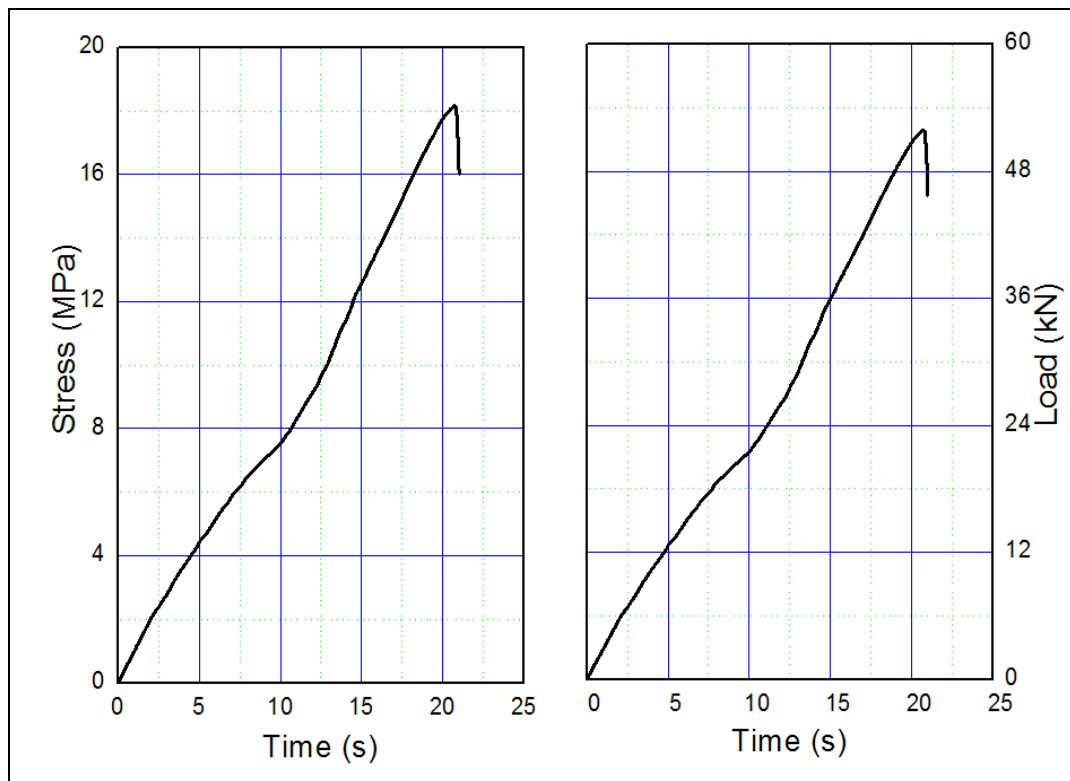
Before



After



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-07
 Depth (m) : 61.65-61.80
 Lithology : Sandstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,62	150,58	1064,3	2982,2

Load (Kn) : 40.27

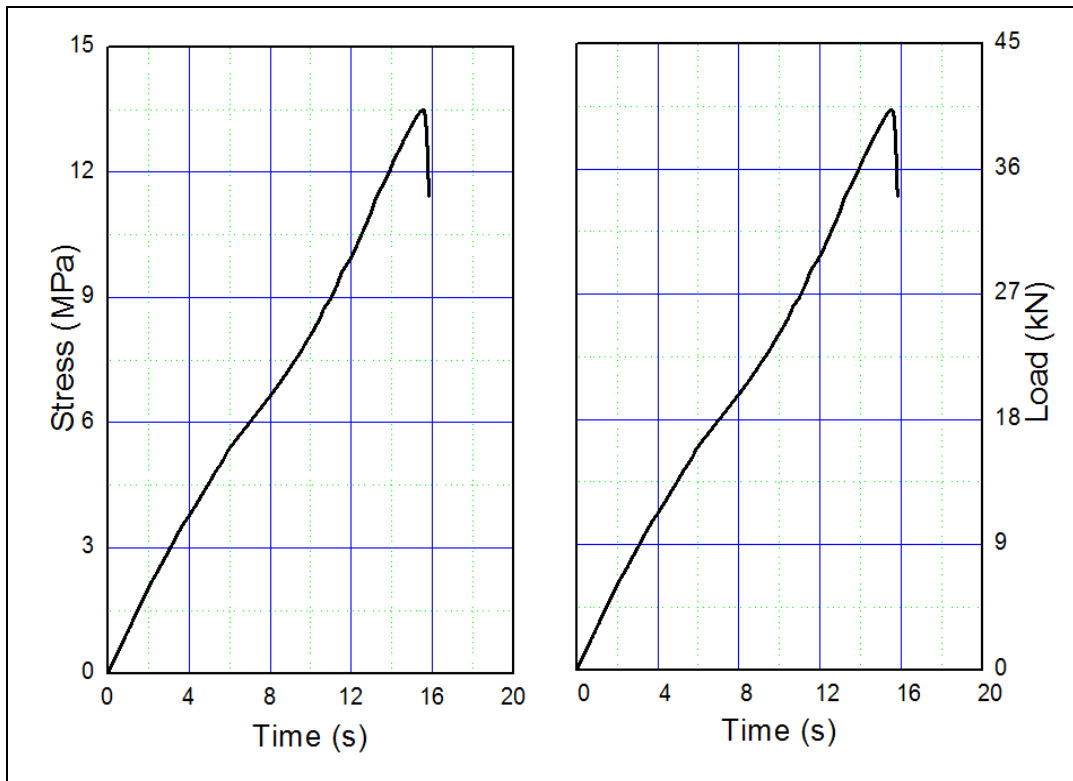
σ_c (Mpa) : 13.50

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-08
 Depth (m) : 78.50-78.65
 Lithology : Sandstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,25	150,54	1031,0	3043,5

Load (Kn) : 34.46

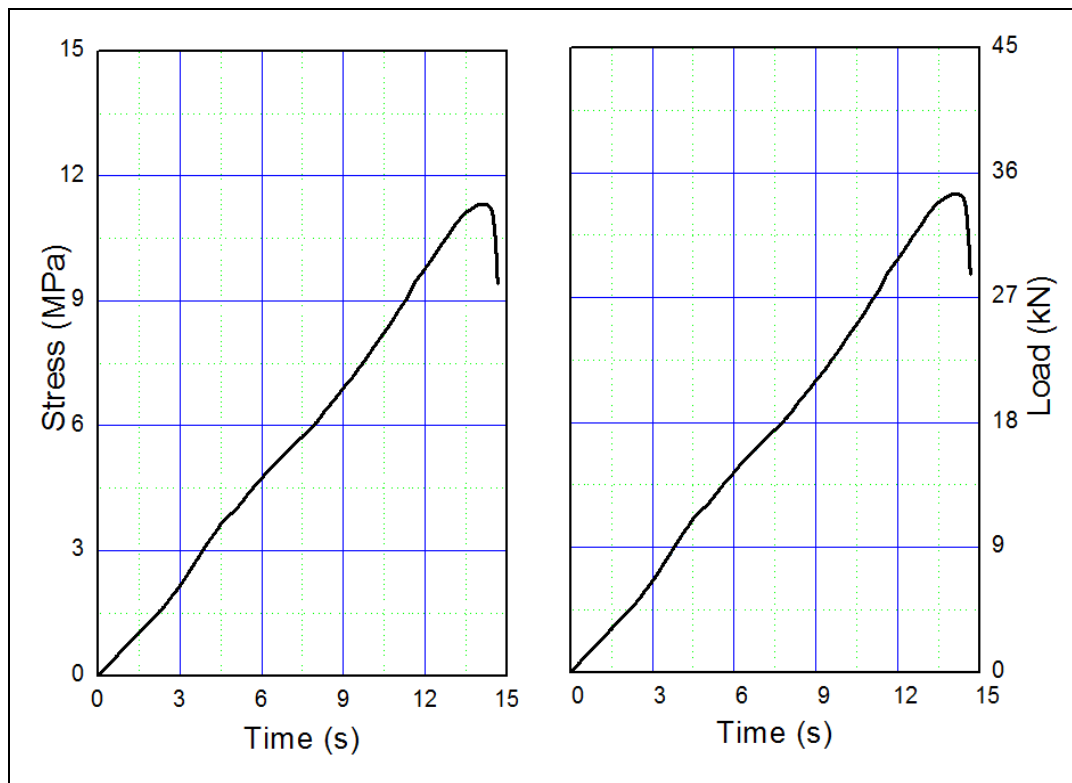
σ_c (Mpa) : 11.32

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-09
 Depth (m) : 89.00-89.15
 Lithology : Mudstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
58,68	150,24	963,3	2704,4

Load (Kn) : 9.80

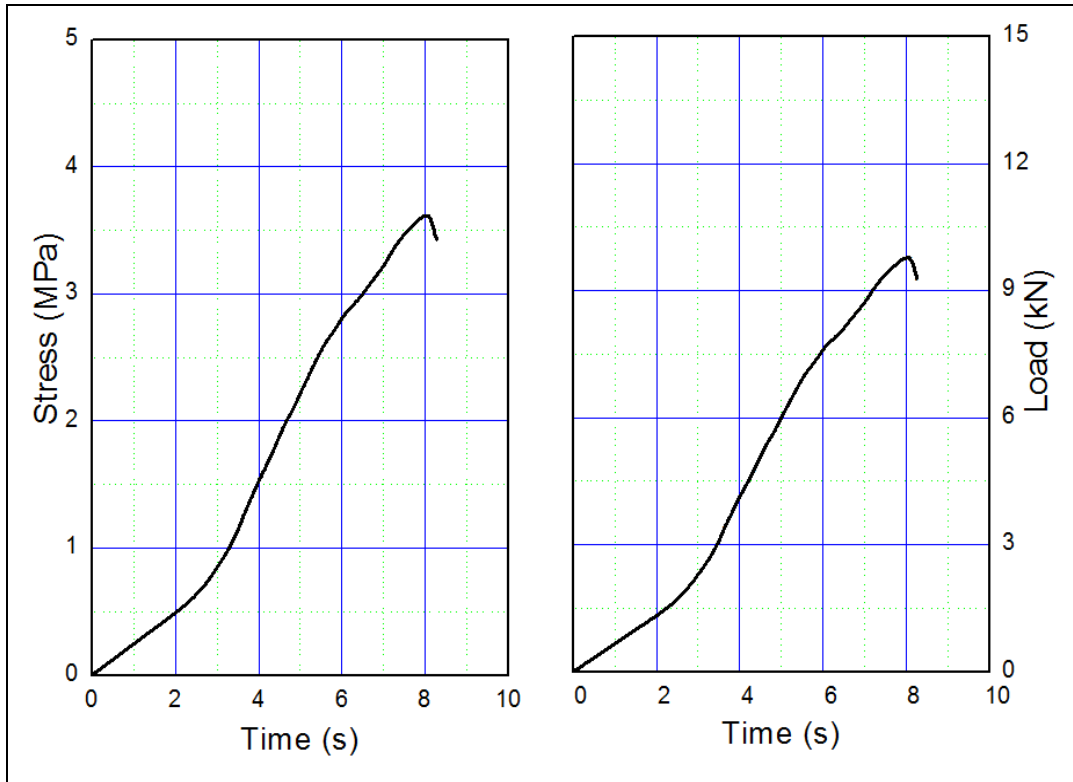
σ_c (Mpa) : 3.63

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-10
 Depth (m) : 94.65-94.80
 Lithology : Sandstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

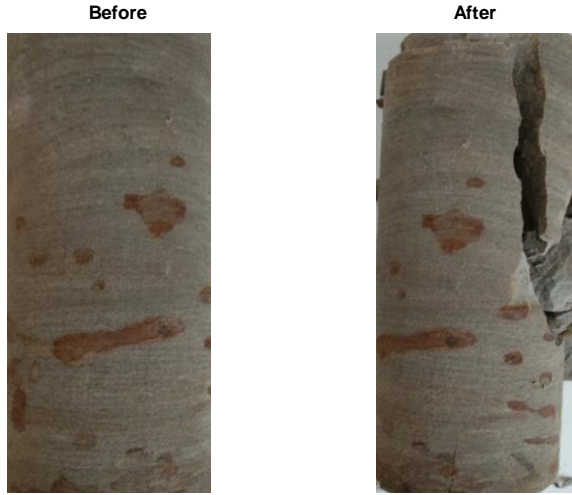
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
59,01	150,99	934,9	2734,9

Load (Kn) : 38.39

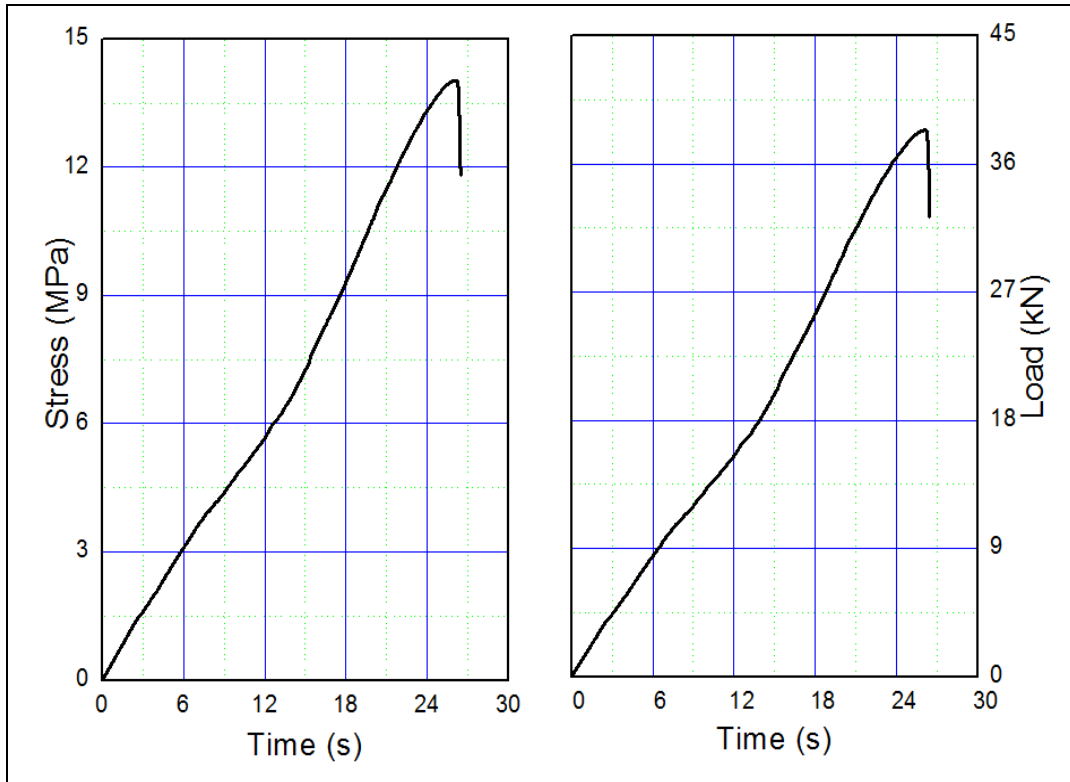
σ_c (Mpa) : 14.04

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



BERAU COAL GREEN MINING SYSTEM

FORMULIR

UNIAXIAL COMPRESSIVE STRENGTH TEST

Customer : PT Berau Coal
 Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
 Project : DDGT-PRP-20-02
 Sample Code : DDGT-PRP-20-02/UCS-11
 Depth (m) : 97.65-97.80
 Lithology : Sandstone
 Standard Method : ISRM 1981

Date of Received : 07 Juli 2020
 Date of Test : 18 September 2020
 Date of Analysis : 26 September 2020
 Tested By : Hardianto
 Checked By : Kurniawan S.

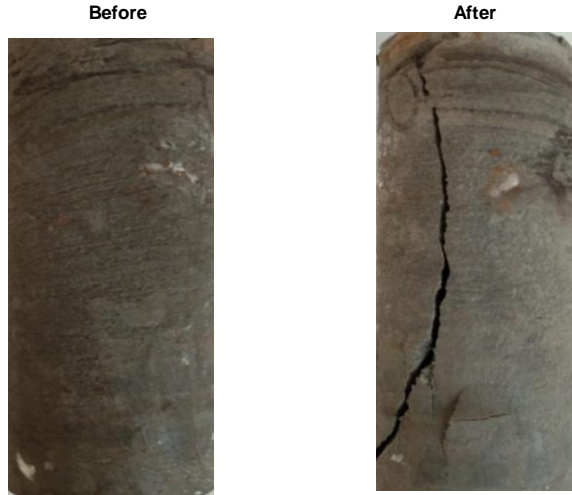
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
59,64	150,89	972,3	2793,6

Load (Kn) : 28.04

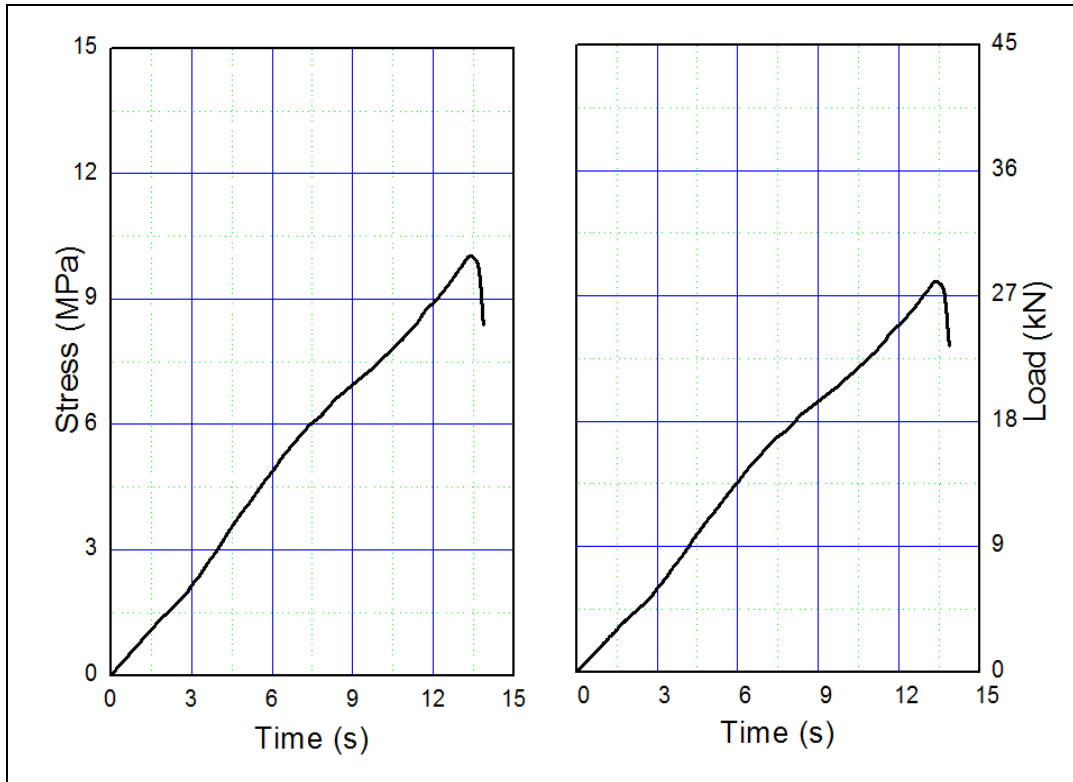
σ_c (Mpa) : 10.04

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
 G&H Lab Analyst

Approved By:

Sindu Umboro
 Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-01
Depth (m) : 11.45-11.60
Lithology : Muddy Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,70	151,26	1002,2	2989,9

Load (Kn) : 21.61

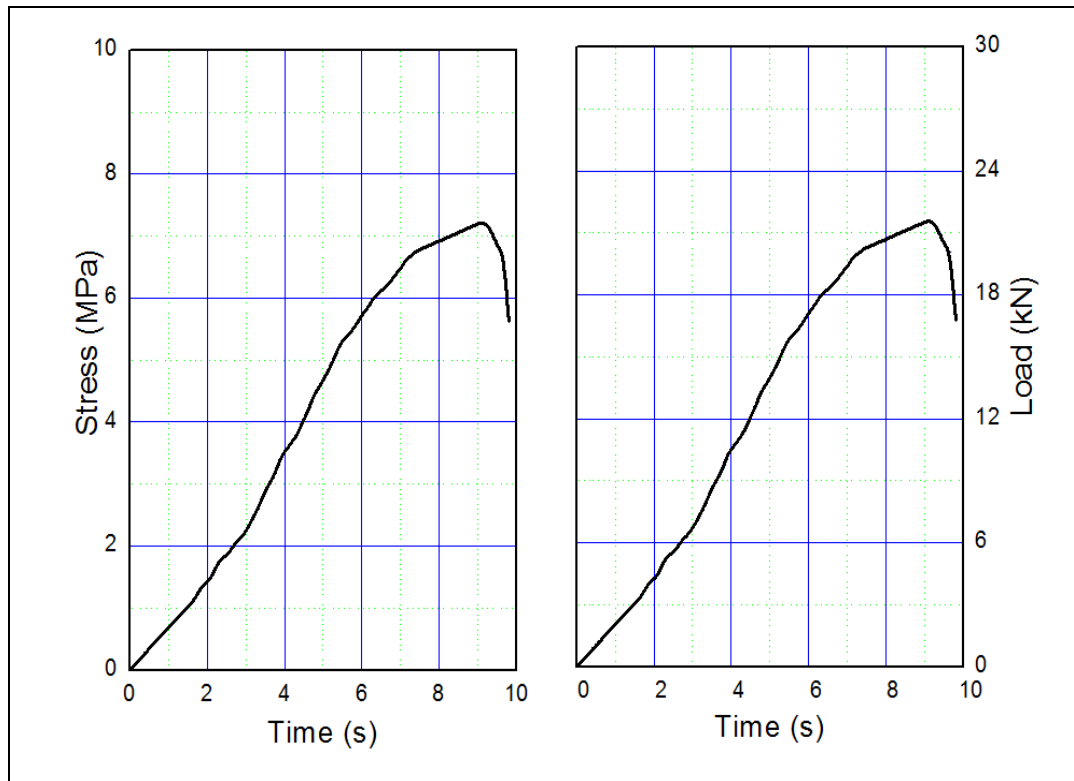
σ_c (Mpa) : 7.23

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-02
Depth (m) : 19.65-19.80
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

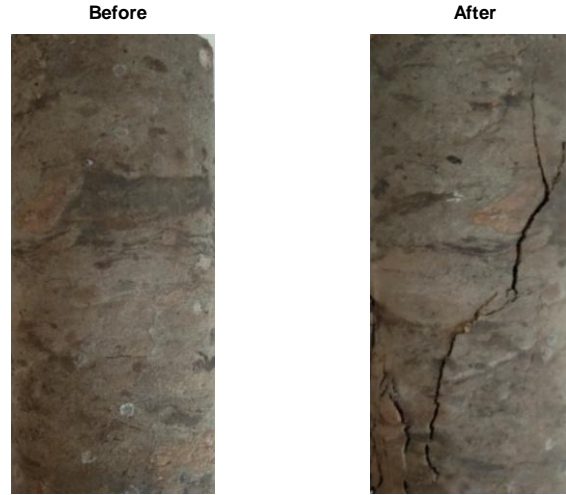
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,40	150,38	992,4	2960,9

Load (Kn) : 17.60

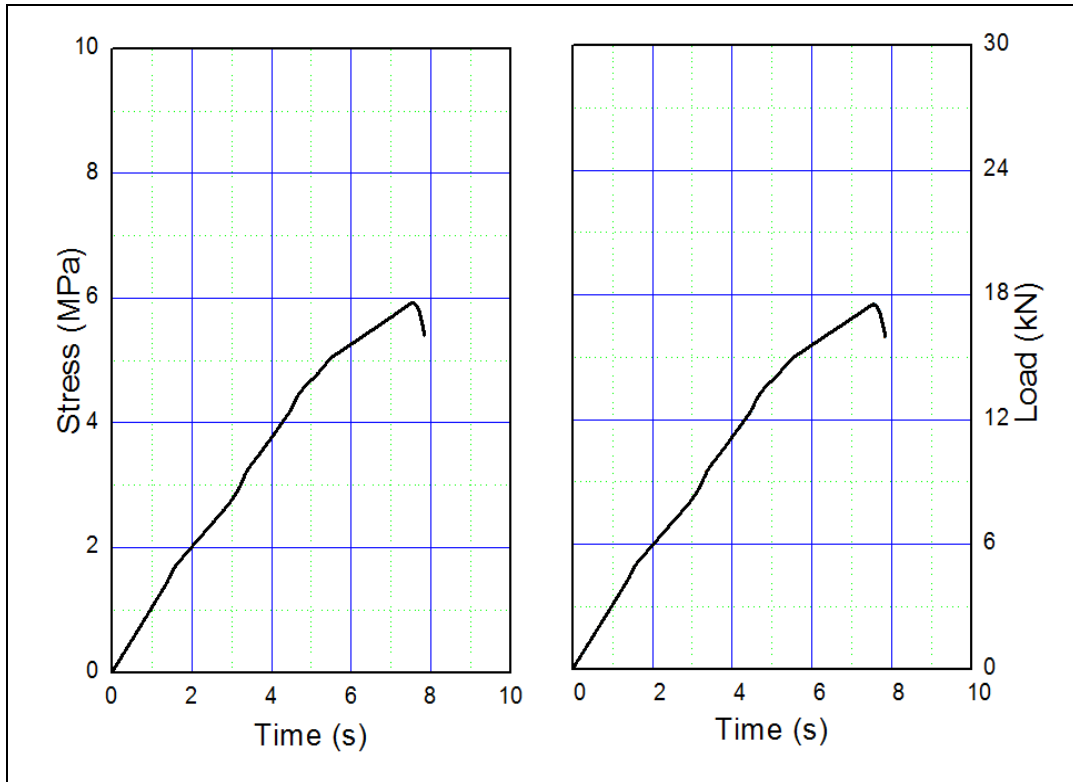
σ_c (Mpa) : 5.95

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-03
Depth (m) : 24.15-24.30
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,80	150,38	1021,2	2999,6

Load (Kn) : 19.26

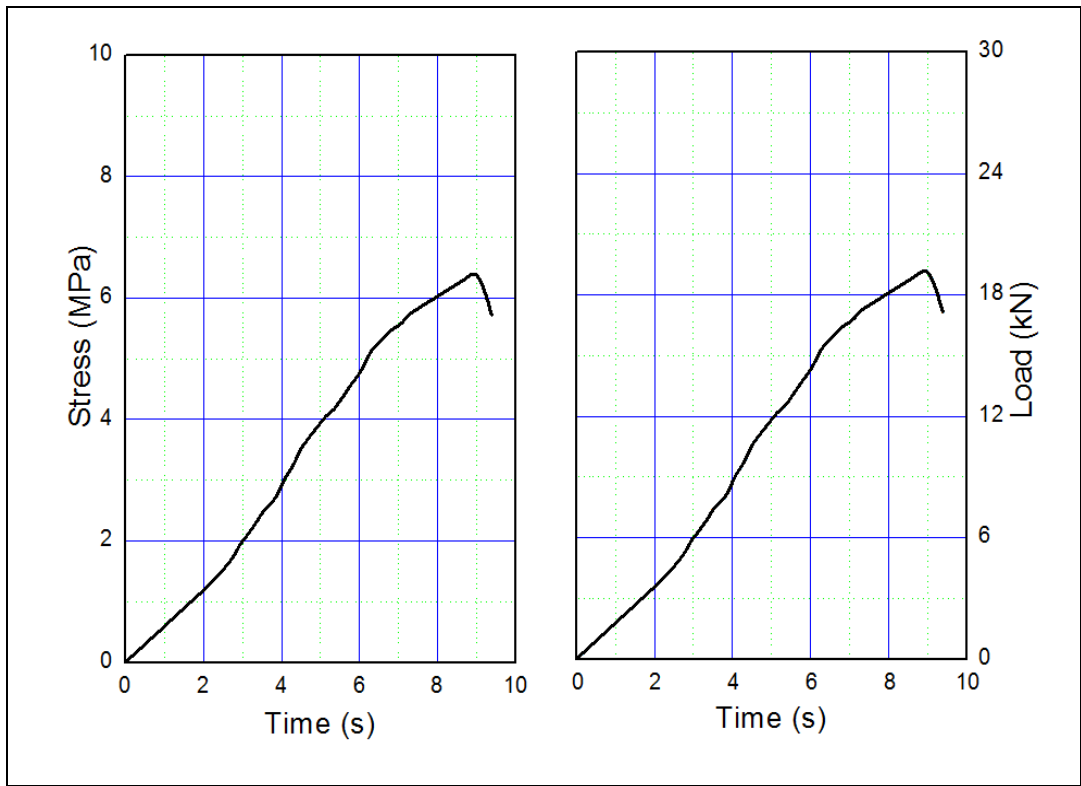
σ_c (Mpa) : 6.42

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-04
Depth (m) : 28.55-28.70
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,89	151,06	1008,5	3008,4

Load (Kn) : 36.05

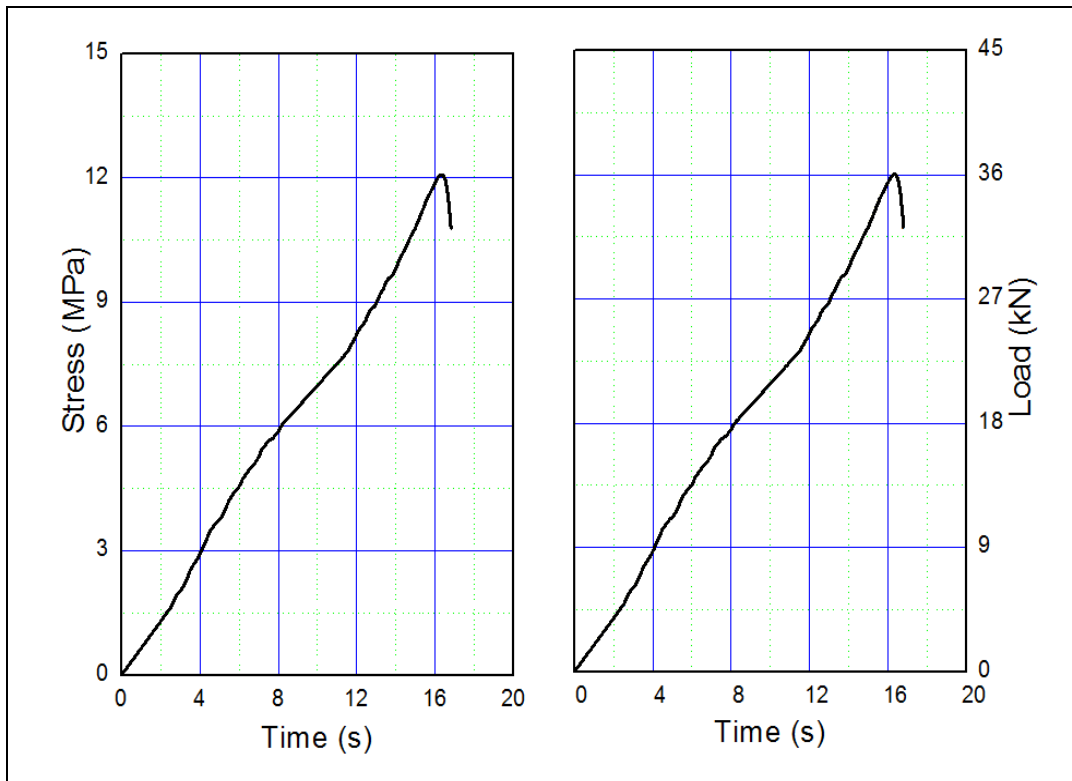
σ_c (Mpa) : 12.09

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-05
Depth (m) : 34.65-34.80
Lithology : Sandstone Laminated Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

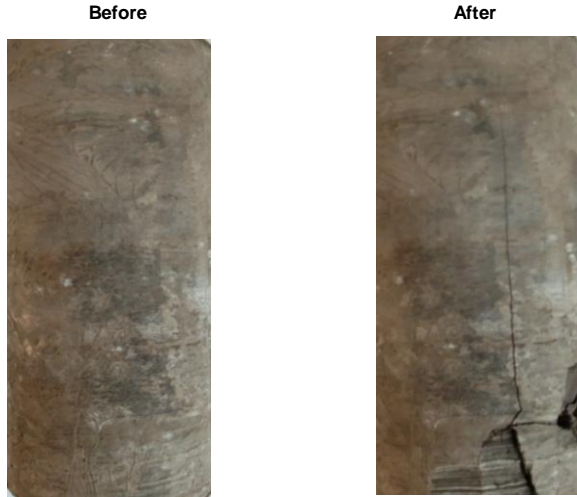
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,62	150,70	1024,8	2982,2

Load (Kn) : 38.49

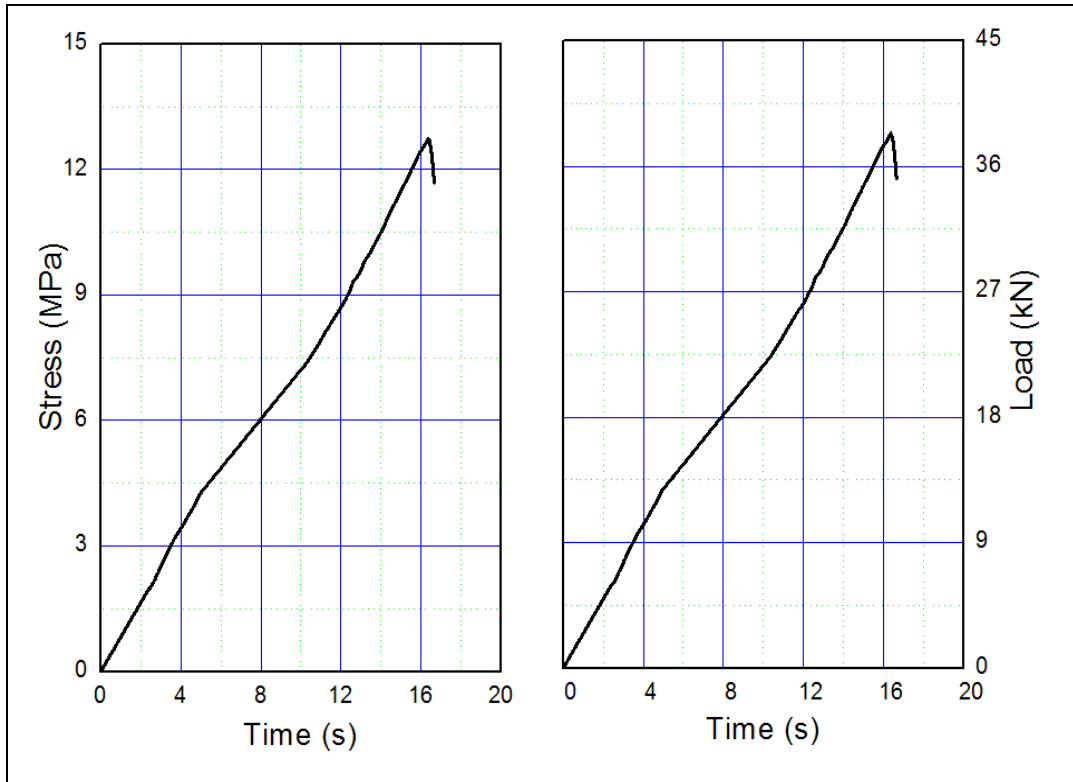
σ_c (Mpa) : 12.80

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-06
Depth (m) : 42.85-43.00
Lithology : Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

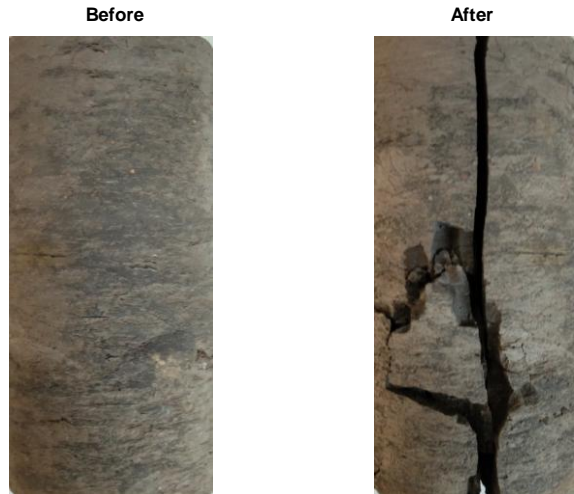
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,12	151,23	1031,0	2934,0

Load (Kn) : 59.21

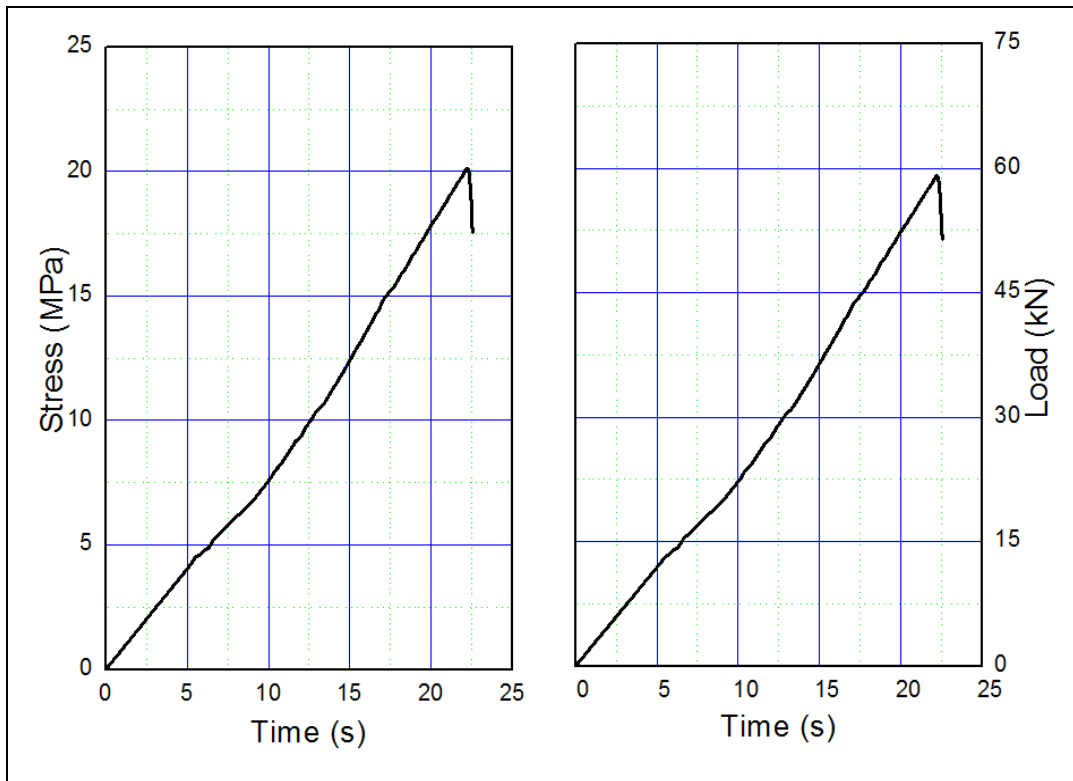
σ_c (Mpa) : 20.18

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-07
Depth (m) : 47.50-47.65
Lithology : Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

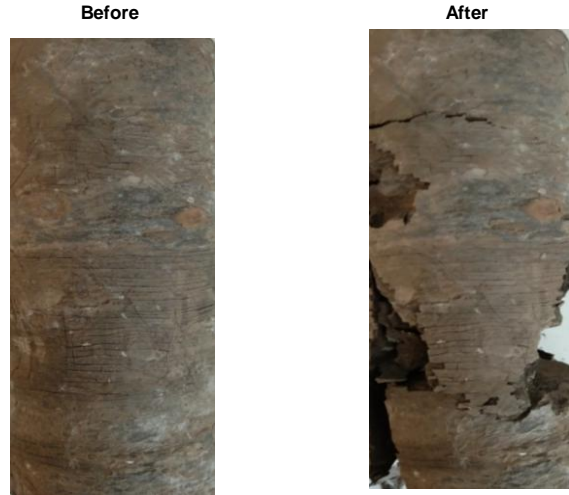
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,07	150,79	1019,6	2929,2

Load (Kn) : 31.00

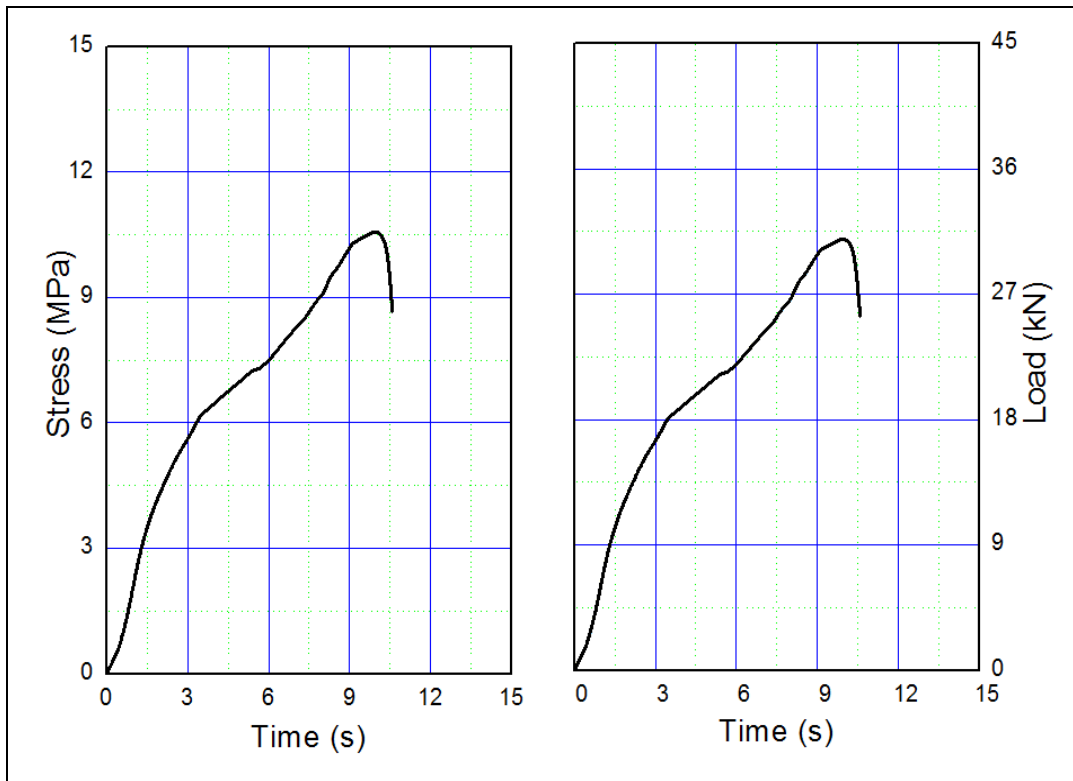
σ_c (Mpa) : 10.59

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-08
Depth (m) : 56.00-56.15
Lithology : Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,10	151,23	1097,4	2932,1

Load (Kn) : 59.07

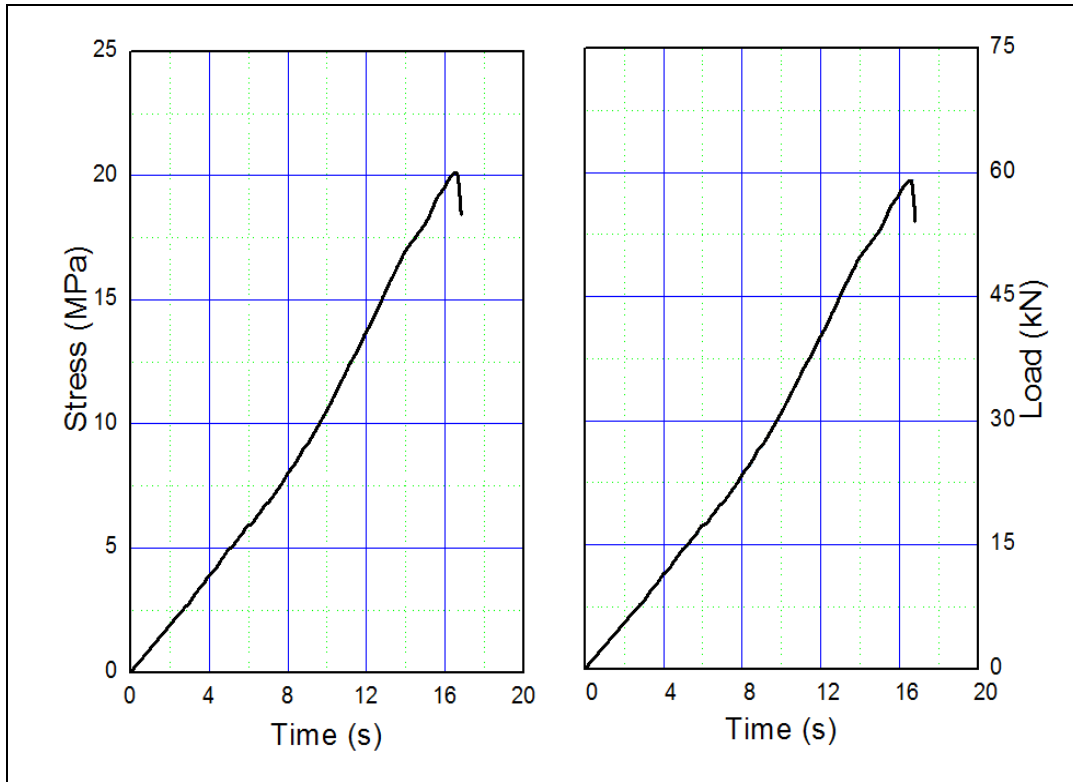
σ_c (Mpa) : 20.15

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-09
Depth (m) : 59.00-59.15
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
60,13	150,78	1077,1	2839,7

Load (Kn) : 64.65

σ_c (Mpa) : 22.77

Remark :

* σ_c : Compressive strength

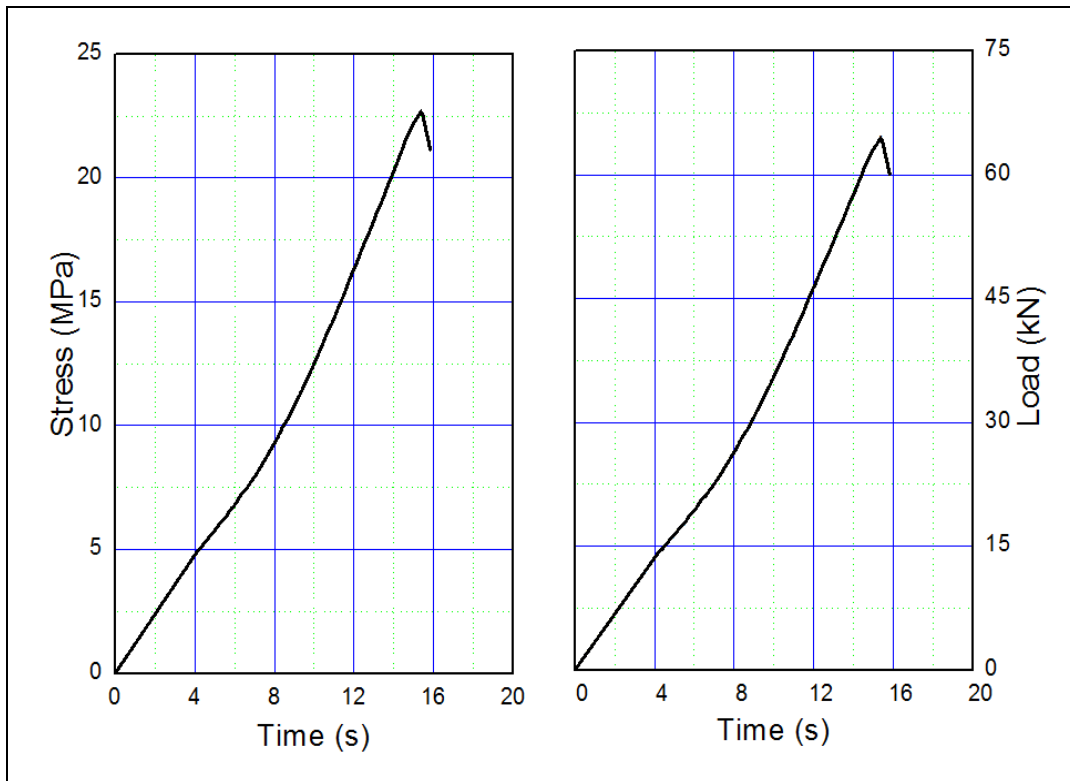
Before



After



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-10
Depth (m) : 64.00-64.15
Lithology : Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,21	151,39	1057,1	2942,6

Load (Kn) : 46.66

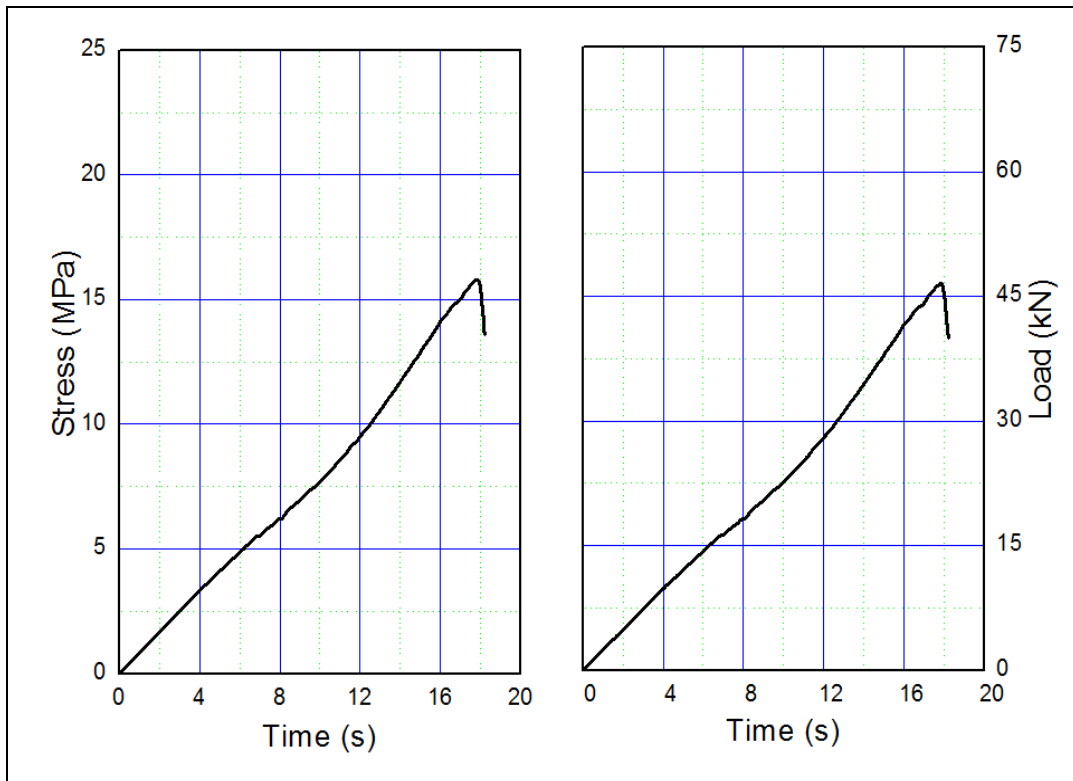
σ_c (Mpa) : 15.86

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-11
Depth (m) : 74.00-74.15
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,50	150,56	1069,3	2970,6

Load (Kn) : 92.00

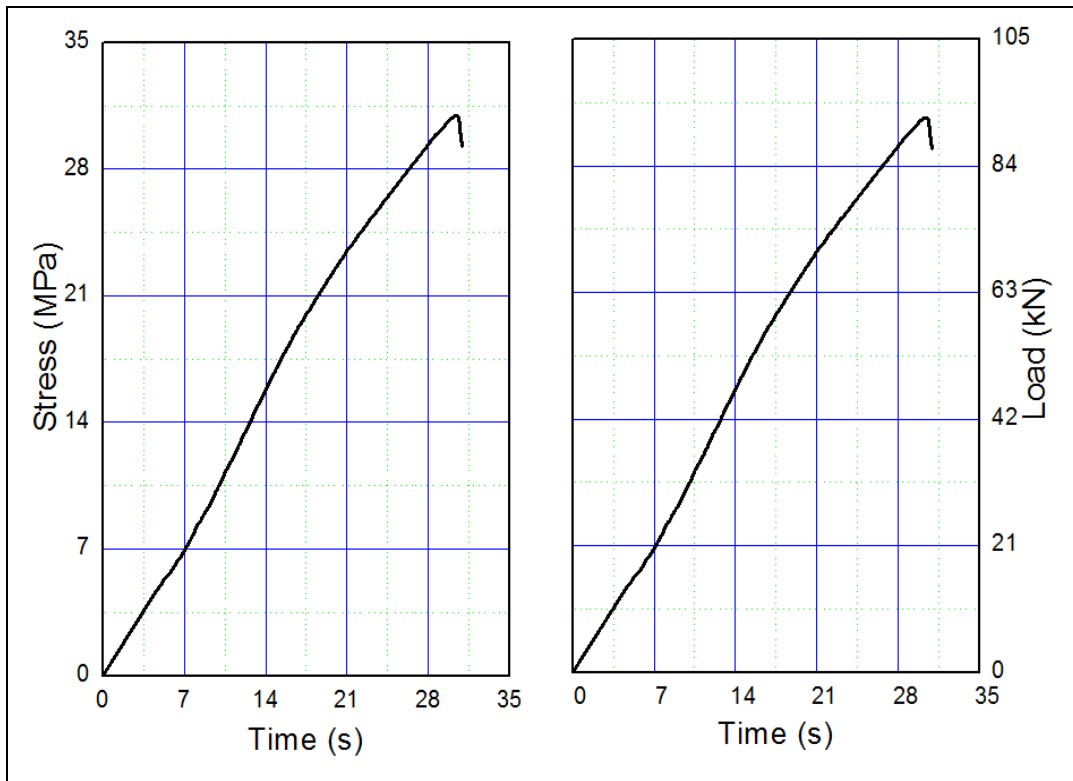
σ_c (Mpa) : 30.97

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator

Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-03
Sample Code : DDGT-PRP-20-03/UCS-12
Depth (m) : 90.80-90.95
Lithology : Interlaminated Mudstone and Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 27 Agustus 2020
Date of Analysis : 18 September 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,25	150,74	1058,0	2946,5

Load (Kn) : 50.58

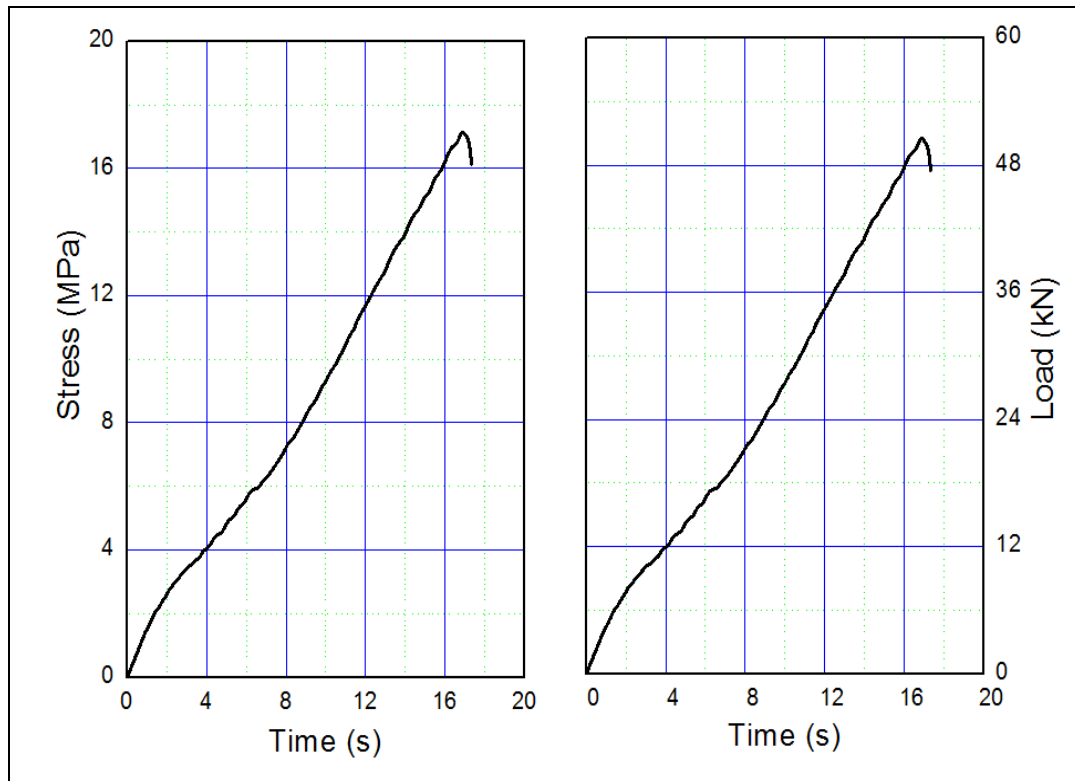
σ_c (Mpa) : 17.17

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:



Kurniawan S.
G&H Lab Analyst

Approved By:



Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-01
Depth (m) : 11.25-11.40
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,55	150,11	969,6	2975,4

Load (Kn) : 7.07

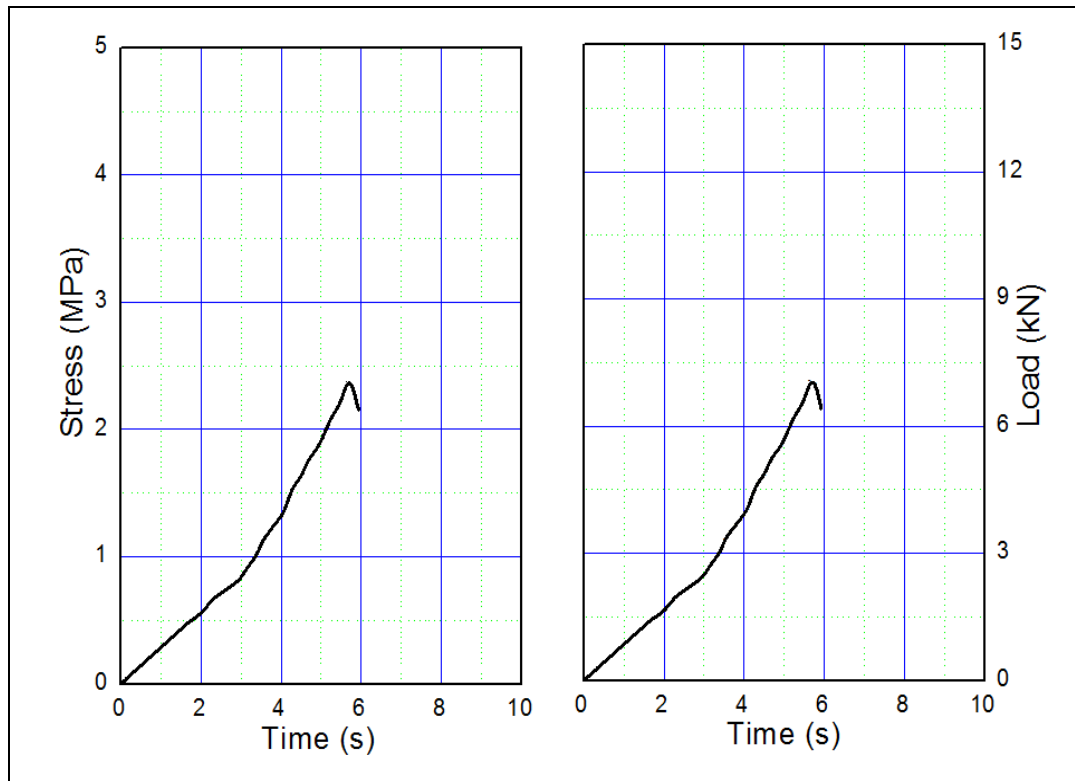
σ_c (Mpa) : 2.38

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-02
Depth (m) : 18.25-18.40
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,36	149,29	1053,0	3054,2

Load (Kn) : 31.87

σ_c (Mpa) : 10.44

Remark :

* σ_c : Compressive strength

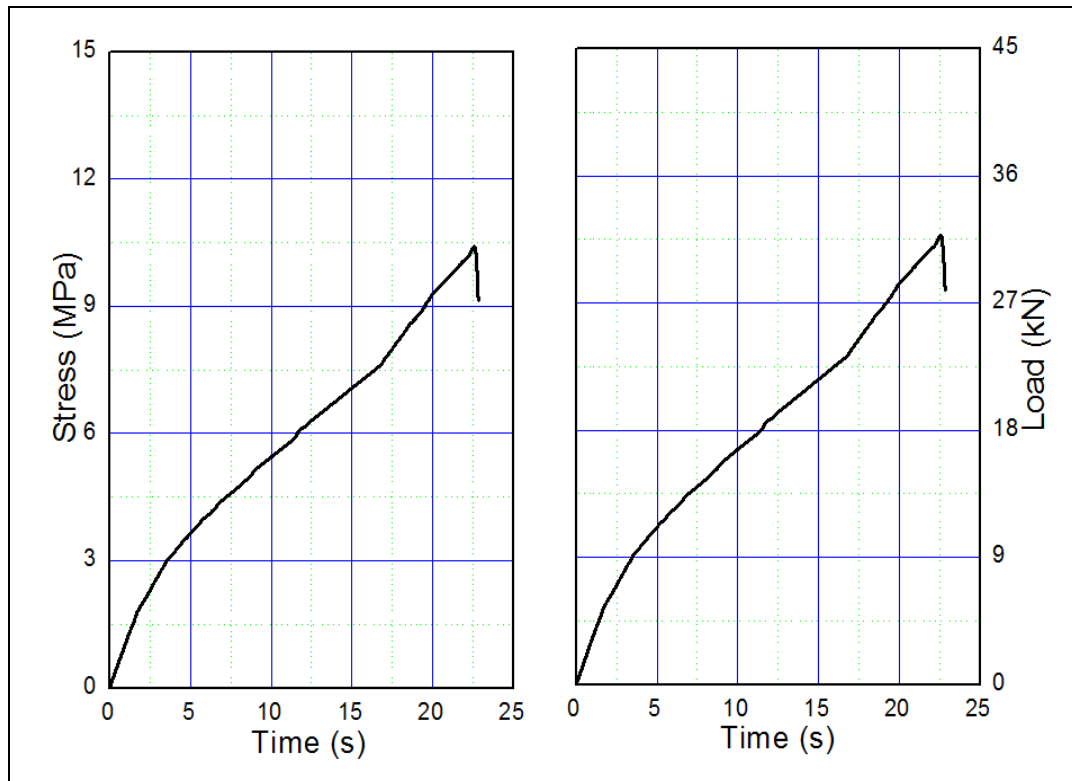
Before



After



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator

Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-03
Depth (m) : 22.25-22.40
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,48	150,00	992,1	2968,6

Load (Kn) : 15.17

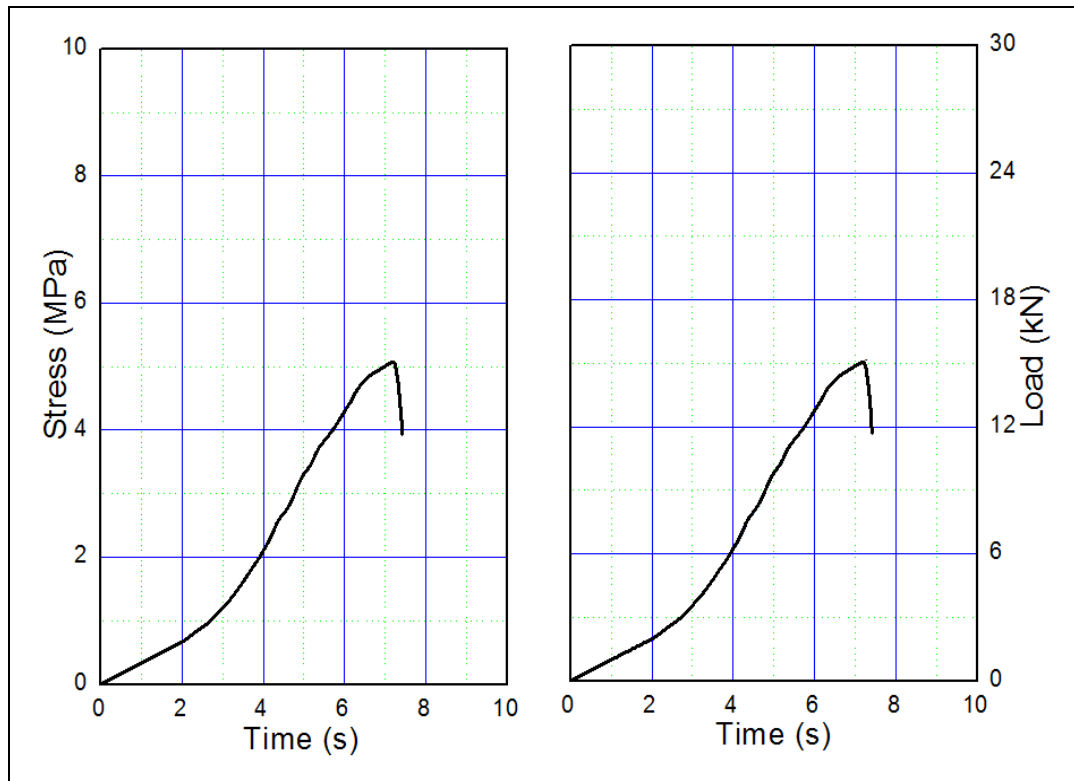
σ_c (Mpa) : 5.11

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:



Kurniawan S.
G&H Lab Analyst

Approved By:



Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-04
Depth (m) : 26.10-26.25
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,50	149,98	1062,8	3068,0

Load (Kn) : 21.13

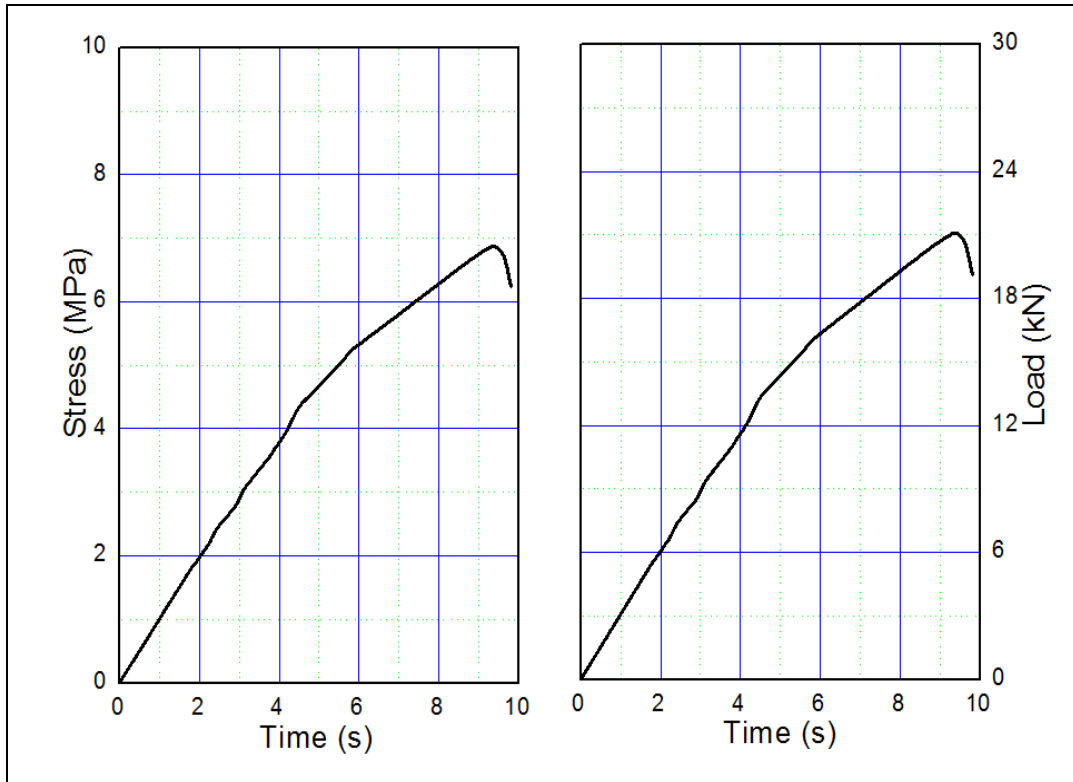
σ_c (Mpa) : 6.89

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-05
Depth (m) : 31.45-31.60
Lithology : Interlaminated Sandstone and Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

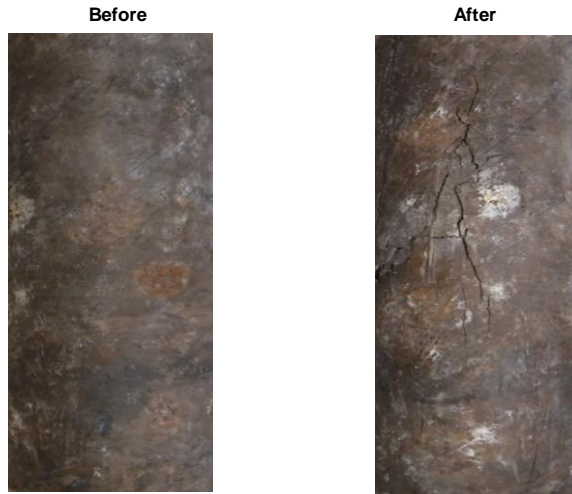
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,00	149,55	1063,2	3019,1

Load (Kn) : 22.72

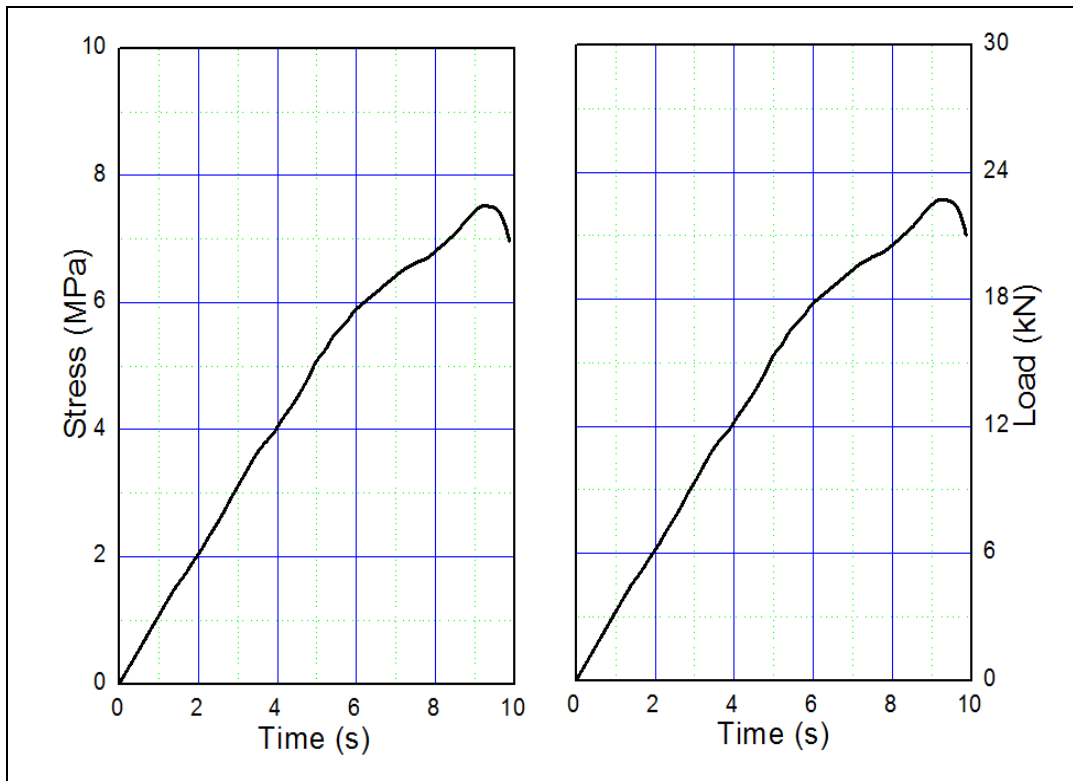
σ_c (Mpa) : 7.53

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-06
Depth (m) : 37.10-37.25
Lithology : Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

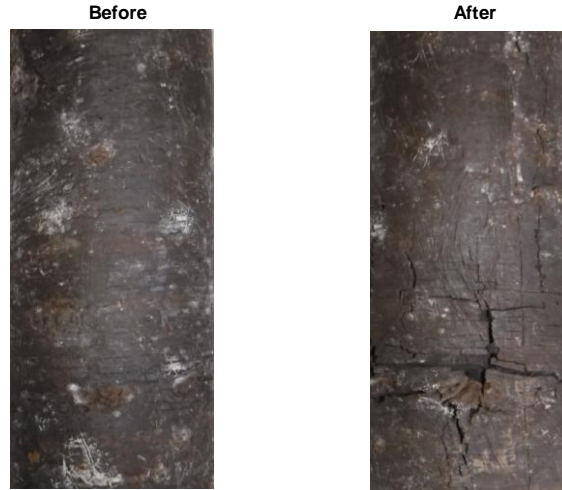
Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,64	148,98	1042,6	2984,1

Load (Kn) : 12.20

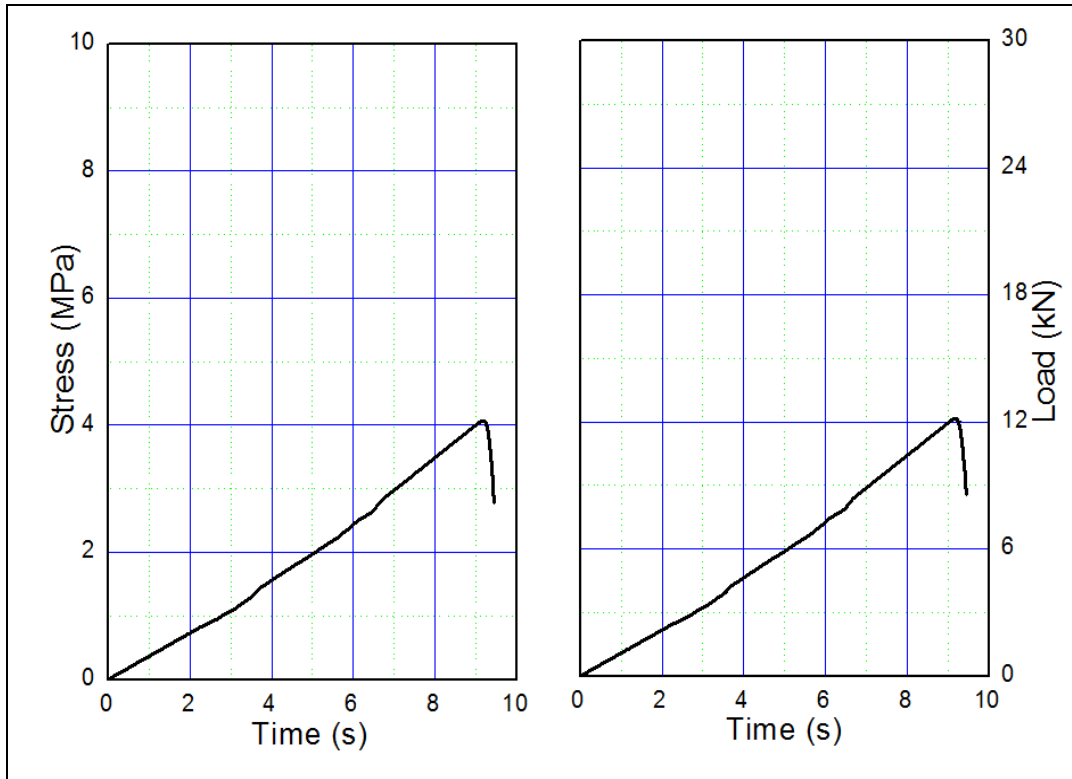
σ_c (Mpa) : 4.09

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-07
Depth (m) : 54.60-54.75
Lithology : Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,08	149,43	1034,8	2930,1

Load (Kn) : 54.25

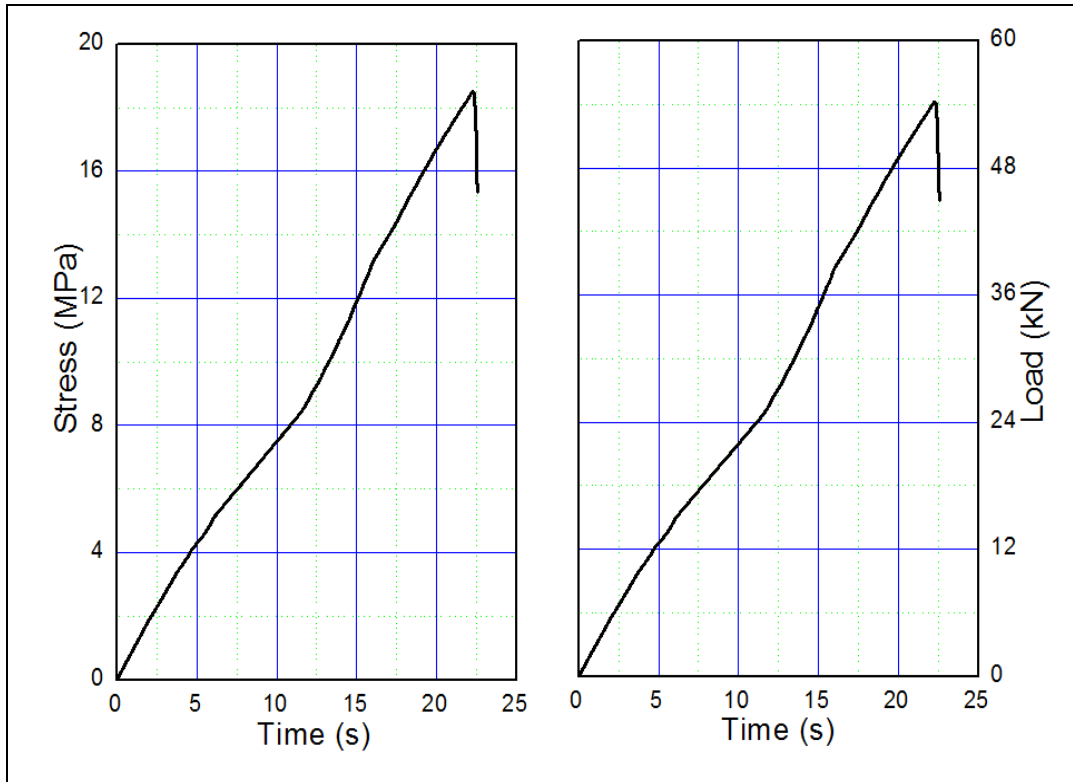
σ_c (Mpa) : 18.52

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-08
Depth (m) : 57.25-57.40
Lithology : Muddy Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,99	150,08	1073,2	3018,1

Load (Kn) : 54.09

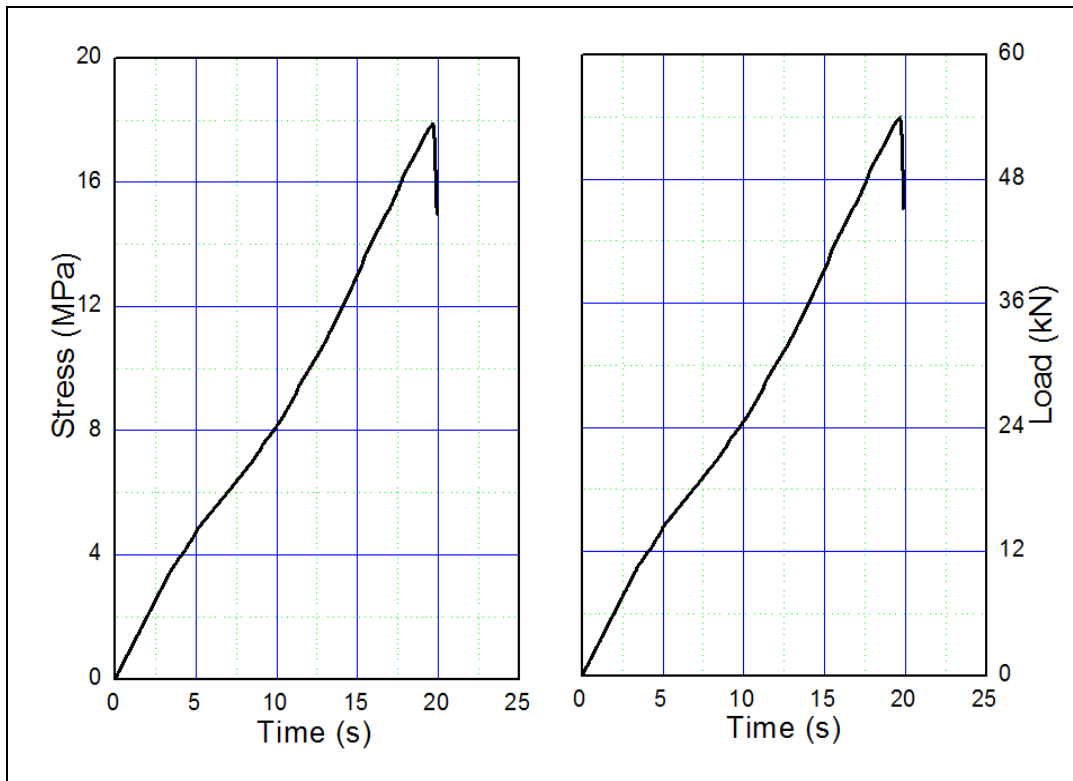
σ_c (Mpa) : 17.92

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-09
Depth (m) : 68.10-68.25
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,33	149,63	1035,1	3051,3

Load (Kn) : 25.61

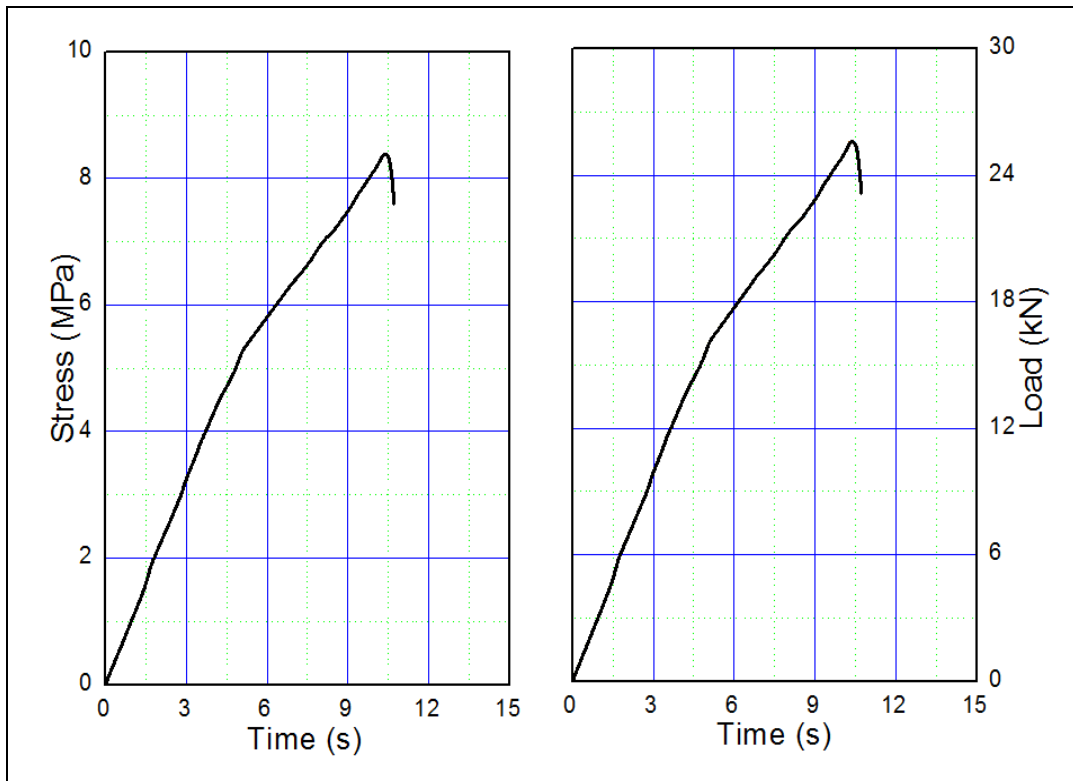
σ_c (Mpa) : 8.39

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-10
Depth (m) : 72.60-72.75
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,52	150,00	1043,8	2972,5

Load (Kn) : 52.35

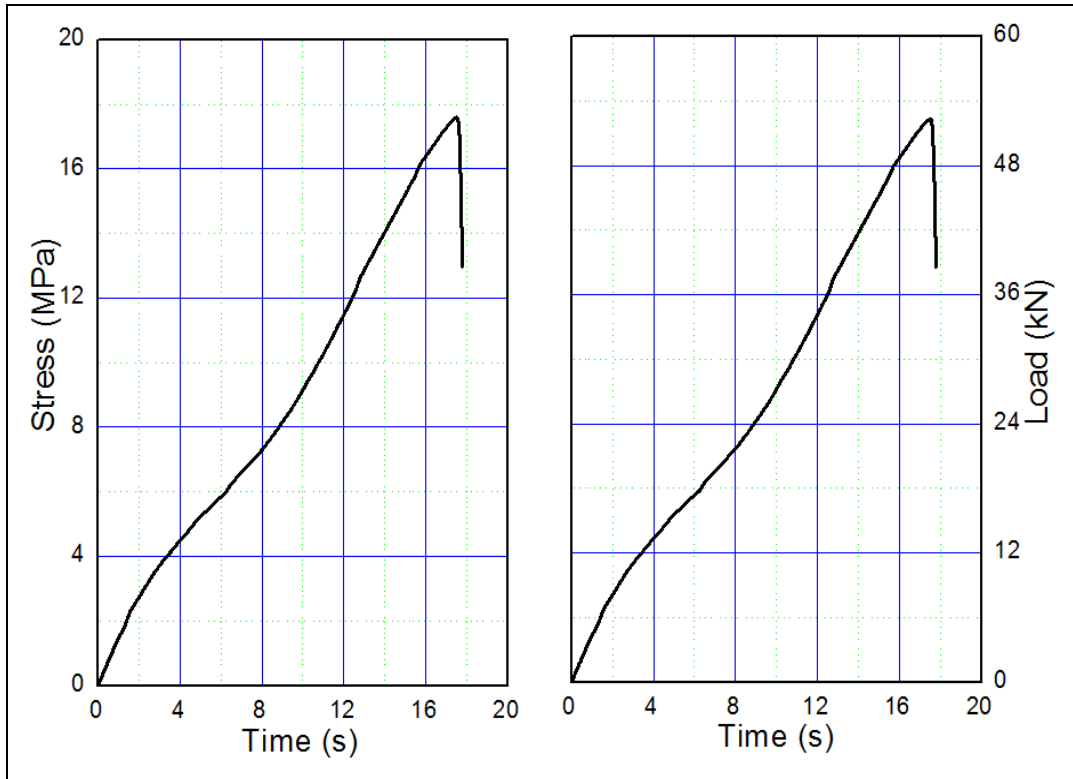
σ_c (Mpa) : 17.61

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator

Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-11
Depth (m) : 77.10-77.25
Lithology : Interlaminated Sandstone and Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
61,87	149,46	1051,8	3006,4

Load (Kn) : 24.41

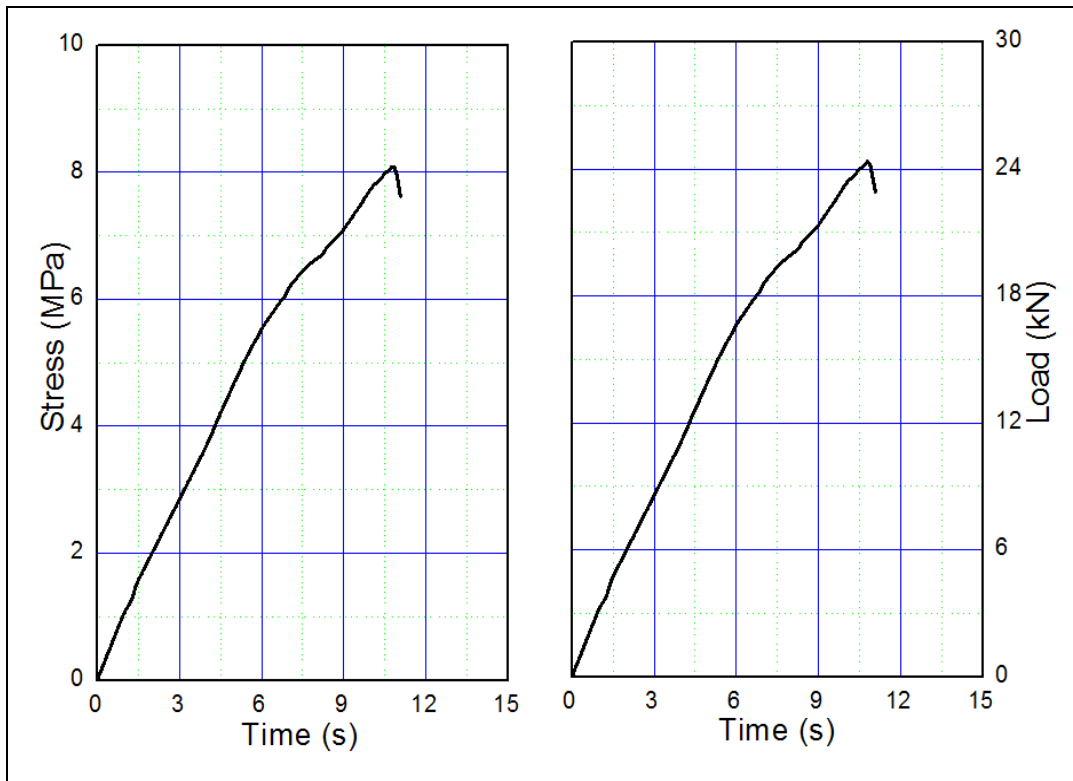
σ_c (Mpa) : 8.12

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:



Kurniawan S.
G&H Lab Analyst

Approved By:



Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-12
Depth (m) : 83.50-83.65
Lithology : Sandstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,25	149,49	1066,1	3043,5

Load (Kn) : 22.61

σ_c (Mpa) : 7.43

Remark :

* σ_c : Compressive strength

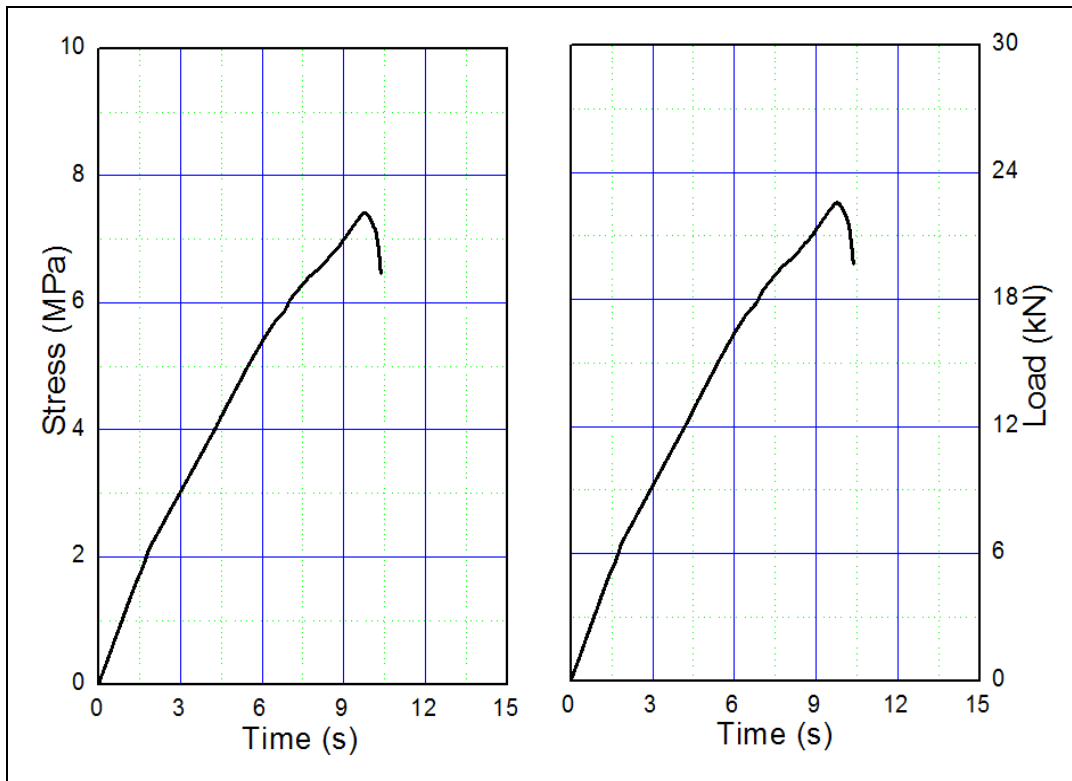
Before



After



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-13
Depth (m) : 90.60-90.75
Lithology : Interlaminated Sandstone and Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,43	149,80	1101,9	3061,1

Load (Kn) : 42.76

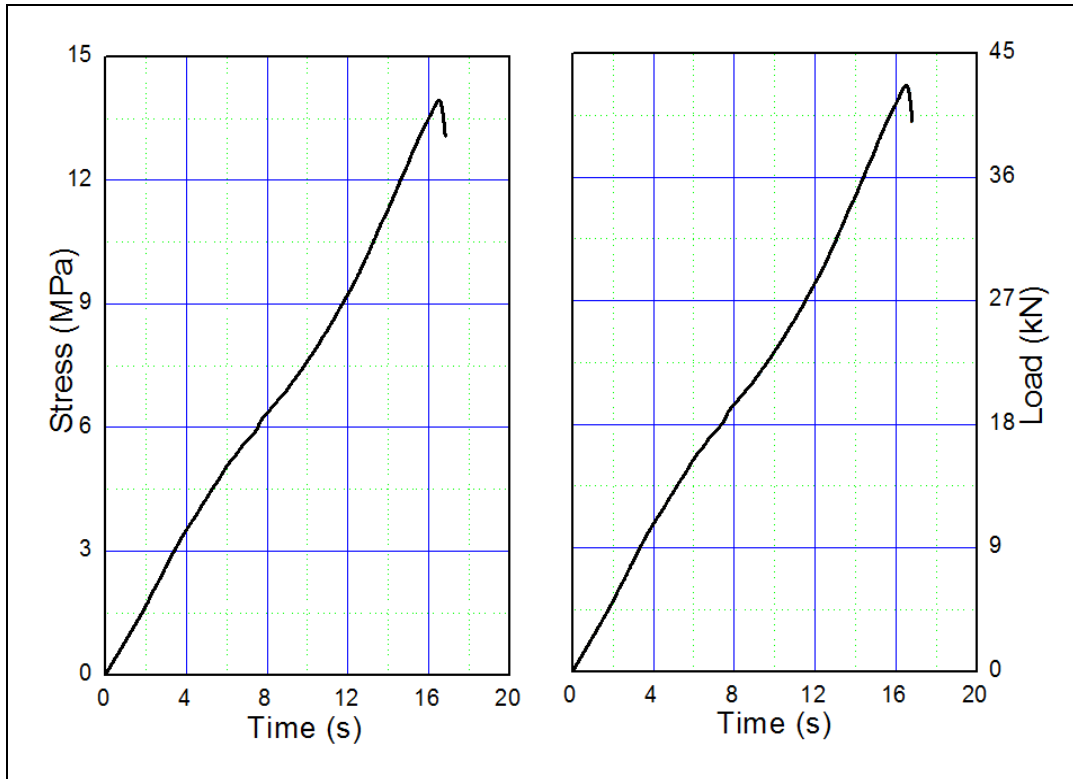
σ_c (Mpa) : 13.97

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator



Customer : PT Berau Coal
Address : Jl. Pemuda No 40 Kec. Tanjung Redeb, Kab Berau, Kaltim 77311
Project : DDGT-PRP-20-04
Sample Code : DDGT-PRP-20-04/UCS-14
Depth (m) : 97.20-97.40
Lithology : Sandy Mudstone
Standard Method : ISRM 1981

Date of Received : 05 Juli 2020
Date of Test : 26 Oktober 2020
Date of Analysis : 02 November 2020
Tested By : Hardianto
Checked By : Kurniawan S.

Diameter (mm)	Height (mm)	Weight (gr)	Area (mm ²)
62,31	149,72	1082,0	3049,3

Load (Kn) : 36.21

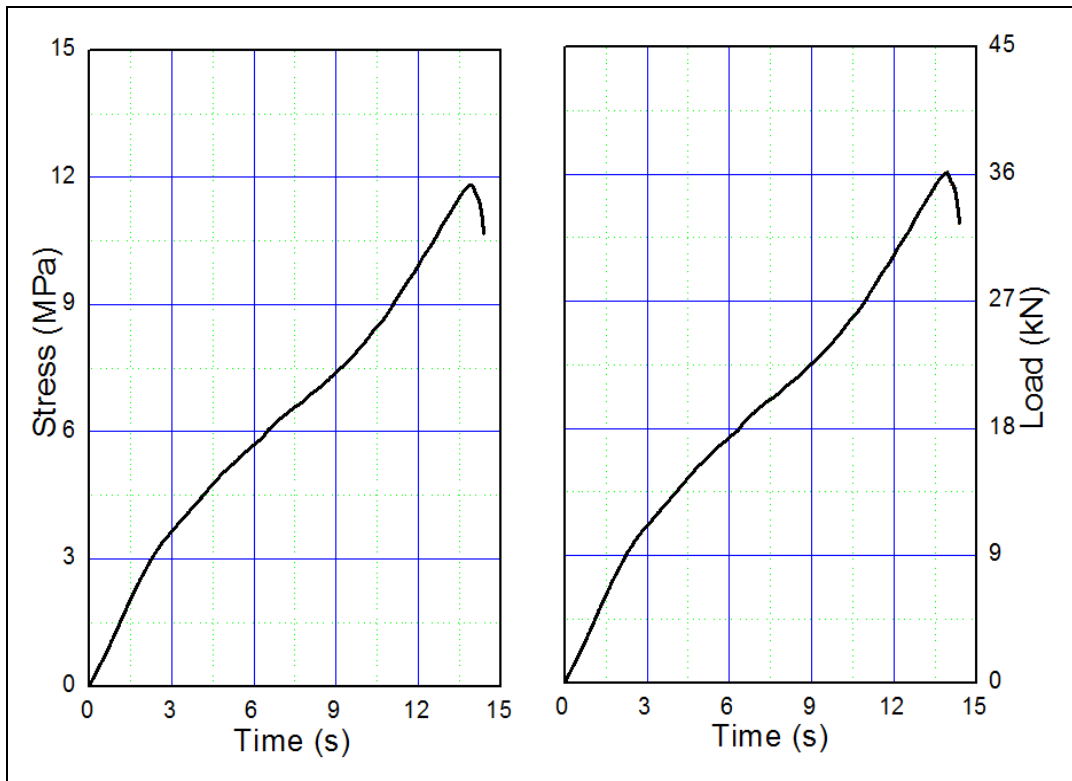
σ_c (Mpa) : 11.88

Remark :

* σ_c : Compressive strength



Stress & Load vs Time Curve



Checked By:

Kurniawan S.
G&H Lab Analyst

Approved By:

Sindu Umboro
Supt. G&H Evaluator

