

## LAMPIRAN



**LABORATORIUM PENGUJIAN PERFORMA MESIN  
JURUSAN TEKNIK MESIN  
FAKULTAS TEKNIK  
UNIVERSITAS NEGERI SURABAYA**

Alamat: Gedung A8 Lt. 1 Lab. Terpadu Fakultas Teknik Kampus Unesa Ketintang Surabaya  
Telp. (031) 8299487, 71205301 (Flexy), 081330670825 (HP), Fax. (031) 8292957

Nomor : 003/Lab.PPM/I/2015  
Lampiran : -  
Hal : Pengambilan Data Laboratorium

Kepada:

Yth. Dosen Pembimbing Tugas Akhir  
**Bapak Pramoda Agung S., S.T., M.T.**  
di  
Surabaya

Yang bertandatangan di bawah ini:

Nama : Diastian Vinaya Wijanarko, S.T., M.T.  
NIP : 198807122015041003  
Jurusan : Teknik Mesin  
Instansi : Universitas Negeri Surabaya

Menyatakan bahwa mahasiswa tersebut di bawah ini:

Nama : Getar Satria K.  
NIM : 1421404606  
Jurusan/Prodi : Teknik Mesin/S1 Teknik Mesin  
Instansi : Universitas 17 Agustus 1945 Surabaya

Telah mengambil data di Laboratorium Pengujian Performa Mesin Jurusan Teknik Mesin FT Unesa  
(*data terlampir*) pada:

Hari : Rabu  
Tanggal : 11 April 2018  
Waktu : 10.00 Wib – Selesai  
Topik PKM-P : Analisa Pengaruh Penambahan Gas Hidrogen dengan Pemasangan Turbo Cyclone  
Terhadap Unjuk Kerja Motor Bensin 110 cc.

Demikian surat keterangan ini dibuat, atas perhatian dan kerjasamanya disampaikan terima kasih.





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Nomor : 001/Lab.PPM/I/2015  
Lampiran : -  
Hal : Pengambilan Data Laboratorium

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Yang bertandatangan di bawah ini:

Nama : Diastian Vinaya Wijanarko, S.T., M.T.  
NIP : 198807122015041003  
Jurusan : Teknik Mesin  
Instansi : Universitas Negeri Surabaya

Menyatakan bahwa mahasiswa tersebut di bawah ini:

Nama : Nizar Arief I.  
NIM : 1421404544  
Jurusan/Prodi : Teknik Mesin/S1 Teknik Mesin  
Instansi : Universitas 17 Agustus 1945 Surabaya

Telah mengambil data di Laboratorium Pengujian Performa Mesin Jurusan Teknik Mesin FT Unesa  
(*data terlampir*) pada:

Hari : Rabu  
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Demikian surat keterangan ini dibuat, atas perhatian dan kerjasamanya disampaikan terima kasih.

Surabaya, 11 April 2018

Kasub: Laboratorium Pengujian Performa Mesin



**Diastian Vinaya Wijanarko, S.T., M.T.**

NIP. 198807122015041003



**LABORATORIUM PENGUJIAN PERFORMA MESIN  
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Alamat: Gedung A8 Lt. 1 Lab. Terpadu Fakultas Teknik Kampus Unesa Ketintang Surabaya  
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Nomor : 001/Lab.PPM/I/2015  
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Hal : Pengambilan Data Laboratorium

Kepada:

Yth. Dosen Pembimbing Tugas Akhir  
**Bapak Pramoda Agung S., S.T., M.T.**  
di  
Surabaya

Yang bertandatangan di bawah ini:

Nama : Diastian Vinaya Wijanarko, S.T., M.T.  
NIP : 198807122015041003  
Jurusan : Teknik Mesin  
Instansi : Universitas Negeri Surabaya

Menyatakan bahwa mahasiswa tersebut di bawah ini:

Nama : Mochamad Yusuf  
NIM : 1421404567  
Jurusan/Prodi : Teknik Mesin/S1 Teknik Mesin  
Instansi : Universitas 17 Agustus 1945 Surabaya

Telah mengambil data di Laboratorium Pengujian Performa Mesin Jurusan Teknik Mesin FT Unesa  
(*data terlampir*) pada:

Hari : Rabu  
Tanggal : 11 April 2018  
Waktu : 10.00 Wib – Selesai  
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Demikian surat keterangan ini dibuat, atas perhatian dan kerjasamanya disampaikan terima kasih.

Surabaya, 11 April 2018

Kasubid Laboratorium Pengujian Performa Mesin



**Diastian Vinaya Wijanarko, S.T., M.T.**  
NIP. 198807122015041003



**SPORTDYNO V3.3**  
**DYNAMOMETER:** SD325  
**ROLLER INERTIA:** 4.6

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

**DATA FOR TEST: VEGA R GIGI 4 TEST**

RPM	HP (HP)	TQ (N*M)	EXHAUST I
3500	3.4	63.03	102.2
4000	3.7	58.75	102.2
4500	4.5	64.50	102.2
5000	5.2	66.44	102.2
<b>5139</b>	5.5	<b>68.01</b>	102.2
5500	5.7	66.88	102.2
6000	6.2	66.07	102.2
6500	6.4	62.75	102.2
7000	6.5	59.35	102.2
<b>7245</b>	<b>6.6</b>	58.41	102.2
7500	6.5	55.26	102.2
8000	6.1	48.93	102.2
8500	5.5	41.20	102.2
9000	5.2	36.89	102.2

**LOSSES:** 6.3 HP 65.9N\*M  
**TOTAL ENGINE:** 0.3HP 2.11N\*M



**SPORTDYNO V3.3**  
**DYNAMOMETER:** SD325  
**ROLLER INERTIA:** 4.6

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

**DATA FOR TEST: VEGA R GIGI 4 TEST 001**

RPM	HP (HP)	TQ (N*M)	EXHAUST I
3500	3.4	63.36	102.2
4000	3.9	63.50	102.2
4500	4.5	65.02	102.2
5000	5.3	67.98	102.2
<b>5067</b>	5.4	<b>68.50</b>	102.2
5500	5.7	66.50	102.2
6000	6.1	65.12	102.2
6500	6.3	62.70	102.2
7000	6.5	59.09	102.2
<b>7218</b>	<b>6.6</b>	59.10	102.2
7500	6.5	55.49	102.2
8000	6.2	49.58	102.2
8500	5.6	42.47	102.2
9000	5.4	38.44	102.2

**LOSSES:** 0.0 HP 0.0N\*M  
**TOTAL ENGINE:** 6.6HP 68.50N\*M



**SPORTDYNO V3.3**  
**DYNAMOMETER:** SD325  
**ROLLER INERTIA:** 4.6

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

**DATA FOR TEST: VEGA R GIGI 4 TEST 002**

<b>RPM</b>	<b>HP (HP)</b>	<b>TQ (N*M)</b>	<b>EXHAUST I</b>
3500	3.4	63.29	102.2
4000	4.0	63.68	102.2
4500	4.5	64.60	102.2
5000	5.2	66.28	102.2
<b>5158</b>	5.4	<b>67.29</b>	102.2
5500	5.7	66.30	102.2
6000	6.1	65.47	102.2
6500	6.5	63.87	102.2
<b>6983</b>	<b>6.6</b>	60.57	102.2
7000	6.6	59.93	102.2
7500	6.4	54.56	102.2
8000	6.1	49.05	102.2
8500	5.8	43.56	102.2
9000	5.5	38.99	102.2

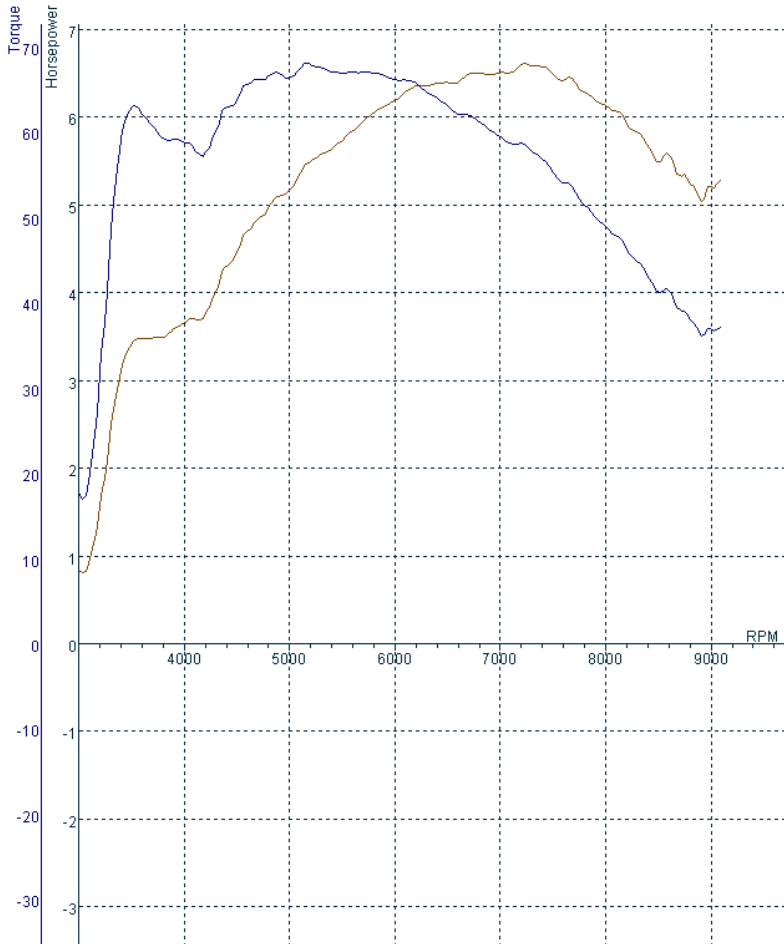
**LOSSES:** 0.0 HP 0.0N\*M  
**TOTAL ENGINE:** 6.6HP 67.29N\*M



**SPORTDYNO V3.3**  
**DYNAMOMETER: SD325**  
**ROLLER INERTIA: 4.6**

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

TEST NAME	MAX POWER	MAX TORQUE	Temp. °C	Humidity %	Pressure	KMH	Date/Time
VEGA R GIGI 4 TEST	6.6 (0.3) / 7245	68.01 (2.11) / 5139	30.9 °C	69 %	1000.0 mbar	61.8	1/1/2002 12:53:03 AM

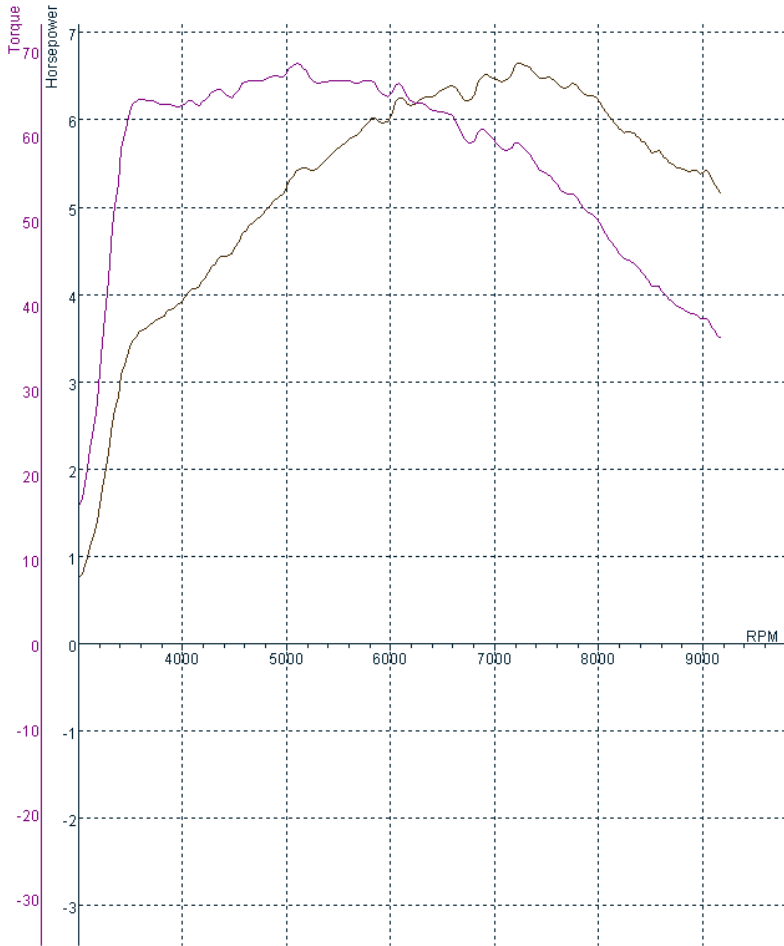




**SPORTDYNO V3.3**  
**DYNAMOMETER: SD325**  
**ROLLER INERTIA: 4.6**

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

TEST NAME	MAX POWER	MAX TORQUE	Temp. °C	Humidity %	Pressure	KMH	Date/Time
VEGA R GIGI 4 TEST 001	6.6 (6.6) / 7218	68.50 (68.50) / 5067	30.9 °C	69 %	1000.0 mbar	62.1	1/1/2002 12:53:22 AM

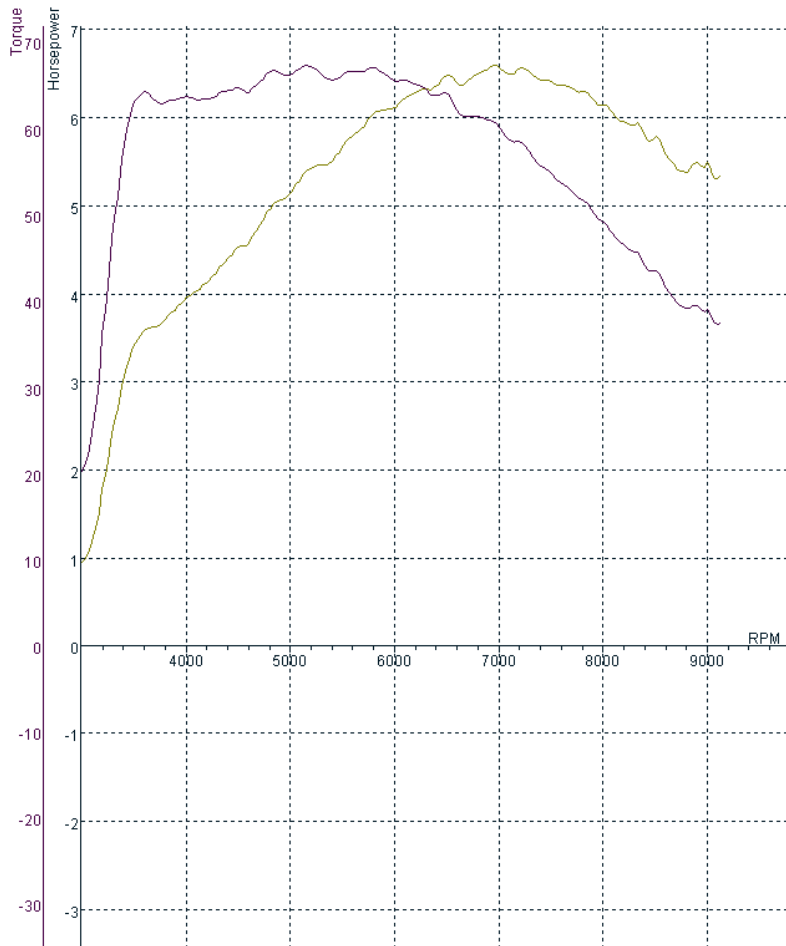




**SPORDYNO V3.3**  
**DYNAMOMETER: SD325**  
**ROLLER INERTIA: 4.6**

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

TEST NAME	MAX POWER	MAX TORQUE	Temp. °C	Humidity %	Pressure	KMH	Date/Time
VEGA R GIGI 4 TEST 002	6.6 (6.6) / 6983	67.29 (67.29) / 5158	30.9 °C	69 %	1000.0 mbar	62.1	1/1/2002 12:53:43 AM







**SPORTDYNO V3.3**  
**DYNAMOMETER:** SD325  
**ROLLER INERTIA:** 4.6

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

**DATA FOR TEST: VEGA R GIGI 4 TEST 001**

RPM	HP (HP)	TQ (N*M)	EXHAUST I
3500	3.5	64.60	102.2
4000	4.0	63.68	102.2
4500	4.6	65.06	102.2
<b>4823</b>	5.1	<b>67.62</b>	102.2
5000	5.3	67.42	102.2
5500	5.7	65.70	102.2
6000	6.1	64.79	102.2
6500	6.3	61.16	102.2
<b>6791</b>	<b>6.5</b>	60.93	102.2
7000	6.3	57.26	102.2
7500	6.3	53.33	102.2
8000	5.8	45.91	102.2
8500	5.4	40.14	102.2
9000	5.0	35.19	102.2

**LOSSES:** 0.0 HP 0.0N\*M  
**TOTAL ENGINE:** 6.5HP 67.62N\*M



**SPORTDYNO V3.3**  
**DYNAMOMETER:** SD325  
**ROLLER INERTIA:** 4.6

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

**DATA FOR TEST: VEGA R GIGI 4 TEST 002**

RPM	HP (HP)	TQ (N*M)	EXHAUST I
3500	3.5	63.59	102.2
4000	3.8	60.49	102.2
4500	4.4	62.02	102.2
5000	5.3	67.66	102.2
<b>5287</b>	5.7	<b>68.92</b>	102.2
5500	5.8	67.66	102.2
6000	6.2	66.14	102.2
<b>6329</b>	<b>6.5</b>	65.37	102.2
6500	6.3	61.75	102.2
7000	6.3	57.43	102.2
7500	6.3	53.82	102.2
8000	6.0	48.23	102.2
8500	5.2	39.03	102.2
9000	5.3	37.58	102.2

**LOSSES:** 0.0 HP 0.0N\*M  
**TOTAL ENGINE:** 6.5HP 68.92N\*M



**SPORTDYNO V3.3**  
**DYNAMOMETER:** SD325  
**ROLLER INERTIA:** 4.6

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

**DATA FOR TEST: VEGA R GIGI 4 TEST 003**

<b>RPM</b>	<b>HP (HP)</b>	<b>TQ (N*M)</b>	<b>EXHAUST I</b>
3500	3.6	66.06	102.2
4000	4.0	63.98	102.2
4500	4.7	66.26	102.2
5000	5.2	66.39	102.2
<b>5208</b>	<b>5.6</b>	<b>67.98</b>	102.2
5500	5.7	66.11	102.2
6000	6.2	65.42	102.2
6500	6.5	63.41	102.2
7000	6.6	59.89	102.2
<b>7256</b>	<b>6.6</b>	57.92	102.2
7500	6.4	54.50	102.2
8000	6.0	47.79	102.2
8500	5.3	39.42	102.2
9000	5.0	35.46	102.2

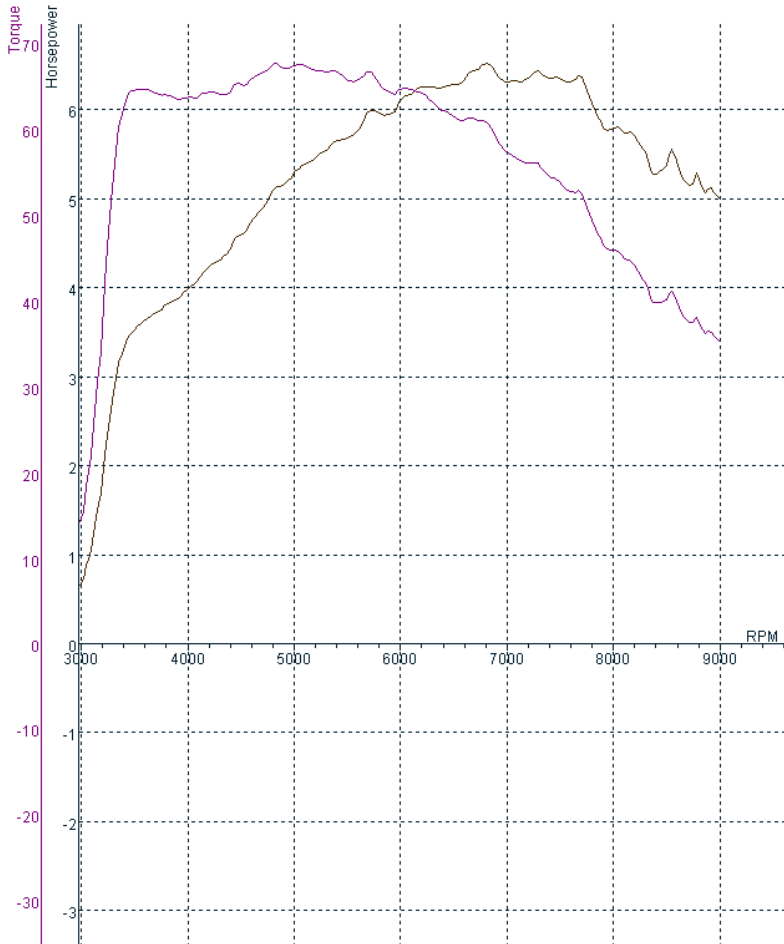
**LOSSES:** 0.7 HP 15.3N\*M  
**TOTAL ENGINE:** 5.9HP 52.69N\*M



**SPORTDYNO V3.3**  
**DYNAMOMETER: SD325**  
**ROLLER INERTIA: 4.6**

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

TEST NAME	MAX POWER	MAX TORQUE	Temp. °C	Humidity %	Pressure	KMH	Date/Time
VEGA R GIGI 4 TEST 001	6.5 (6.5) / 6791	67.62 (67.62) / 4823	30.9 °C	69 %	1000.0 mbar	61.7	1/1/2002 1:24:16 AM

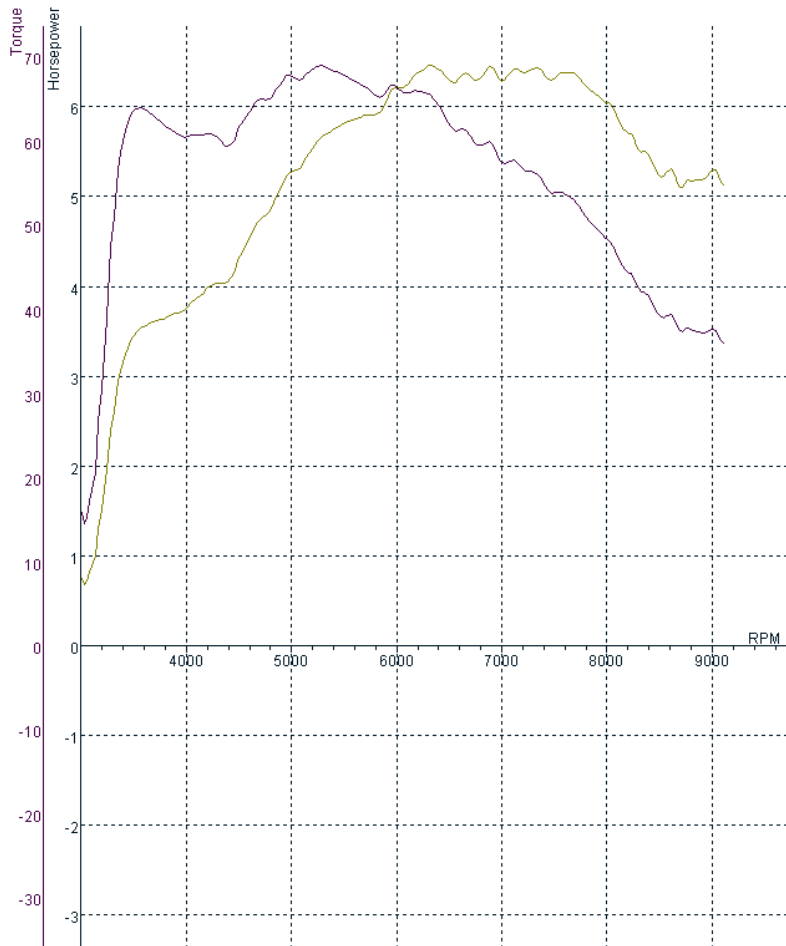




**SPORTDYNO V3.3**  
**DYNAMOMETER: SD325**  
**ROLLER INERTIA: 4.6**

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

TEST NAME	MAX POWER	MAX TORQUE	Temp. °C	Humidity %	Pressure	KMH	Date/Time
VEGA R GIGI 4 TEST 002	6.5 (6.5) / 6329	68.92 (68.92) / 5287	30.9 °C	69 %	1000.0 mbar	61.9	1/1/2002 1:25:41 AM

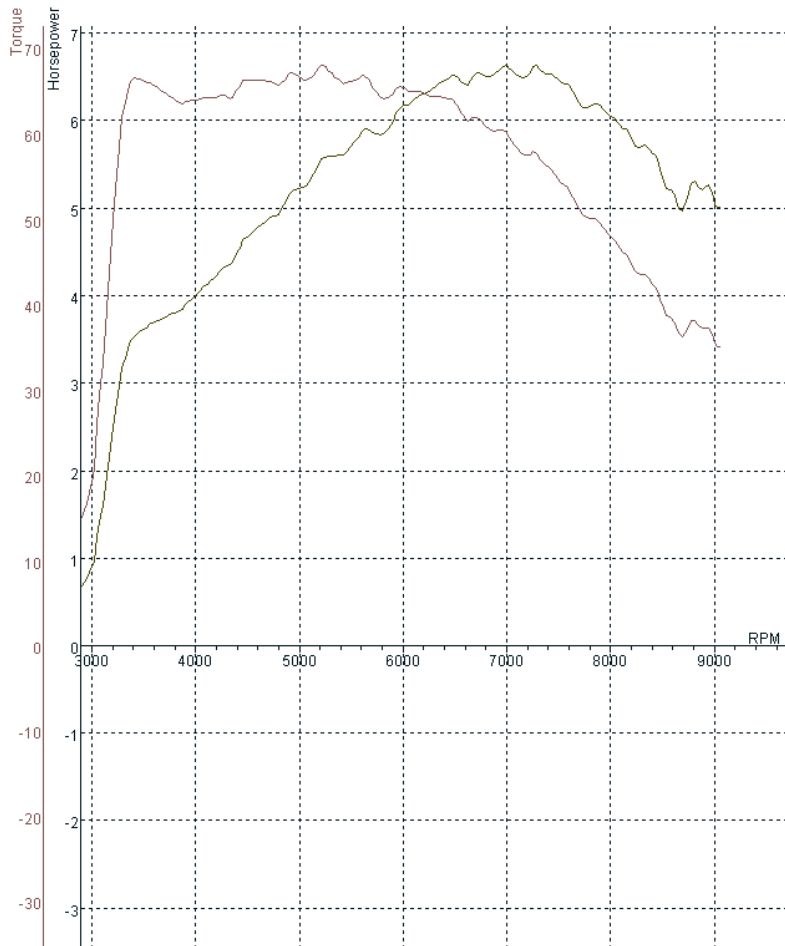




**SPORTDYNO V3.3**  
**DYNAMOMETER: SD325**  
**ROLLER INERTIA: 4.6**

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

TEST NAME	MAX POWER	MAX TORQUE	Temp. °C	Humidity %	Pressure	KMH	Date/Time
VEGA R GIGI 4 TEST 003	6.6 (5.9) / 7256	67.98 (52.69) / 5208	30.9 °C	69 %	1000.0 mbar	62.2	1/1/2002 1:26:01 AM





**SPORTDYNO V3.3**  
**DYNAMOMETER:** SD325  
**ROLLER INERTIA:** 4.6

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

**DATA FOR TEST: VEGA R GIGI 4 TEST 001**

RPM	HP (HP)	TQ (N*M)	EXHAUST 1
3000	3.1	66.88	102.2
<b>3292</b>	3.7	<b>72.09</b>	102.2
3500	3.6	66.27	102.2
4000	4.0	63.49	102.2
4500	4.6	64.47	102.2
5000	5.0	64.06	102.2
5500	5.6	64.31	102.2
6000	5.9	62.41	102.2
<b>6427</b>	<b>6.2</b>	61.14	102.2
6500	6.0	58.58	102.2
7000	5.7	51.31	102.2
7500	5.7	48.19	102.2
8000	4.7	37.20	102.2
8500	4.3	32.07	102.2
9000	4.4	30.69	102.2

**LOSSES:** 0.0 HP 0.0N\*M  
**TOTAL ENGINE:** 6.2HP 72.09N\*M



**SPORTDYNO V3.3**  
**DYNAMOMETER:** SD325  
**ROLLER INERTIA:** 4.6

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

**DATA FOR TEST: VEGA R GIGI 4 TEST 002**

RPM	HP (HP)	TQ (N*M)	EXHAUST 1
3500	3.5	64.73	102.2
4000	3.9	63.32	102.2
4500	4.5	63.88	102.2
5000	5.1	65.16	102.2
<b>5346</b>	5.4	<b>65.62</b>	102.2
5500	5.6	64.78	102.2
6000	5.9	63.25	102.2
6500	6.0	59.28	102.2
7000	5.7	52.37	102.2
<b>7261</b>	<b>6.2</b>	54.70	102.2
7500	5.7	48.98	102.2
8000	5.2	41.93	102.2
8500	4.8	36.45	102.2
9000	4.5	31.99	102.2

**LOSSES:** 0.0 HP 0.0N\*M  
**TOTAL ENGINE:** 6.2HP 65.62N\*M



**SPORTDYNO V3.3**  
**DYNAMOMETER:** SD325  
**ROLLER INERTIA:** 4.6

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

**DATA FOR TEST: VEGA R.GIGI 4 TEST 003**

<b>RPM</b>	<b>HP (HP)</b>	<b>TQ (N*M)</b>	<b>EXHAUST I</b>
3500	3.6	65.37	102.2
4000	4.0	63.69	102.2
4500	4.5	64.36	102.2
<b>4935</b>	5.1	<b>66.85</b>	102.2
5000	5.2	66.20	102.2
5500	5.5	64.17	102.2
6000	5.8	61.59	102.2
6500	5.9	57.87	102.2
7000	5.9	53.54	102.2
<b>7392</b>	<b>6.1</b>	52.35	102.2
7500	5.8	49.30	102.2
8000	4.3	34.51	102.2
8500	4.4	32.93	102.2
9000	4.6	32.28	102.2

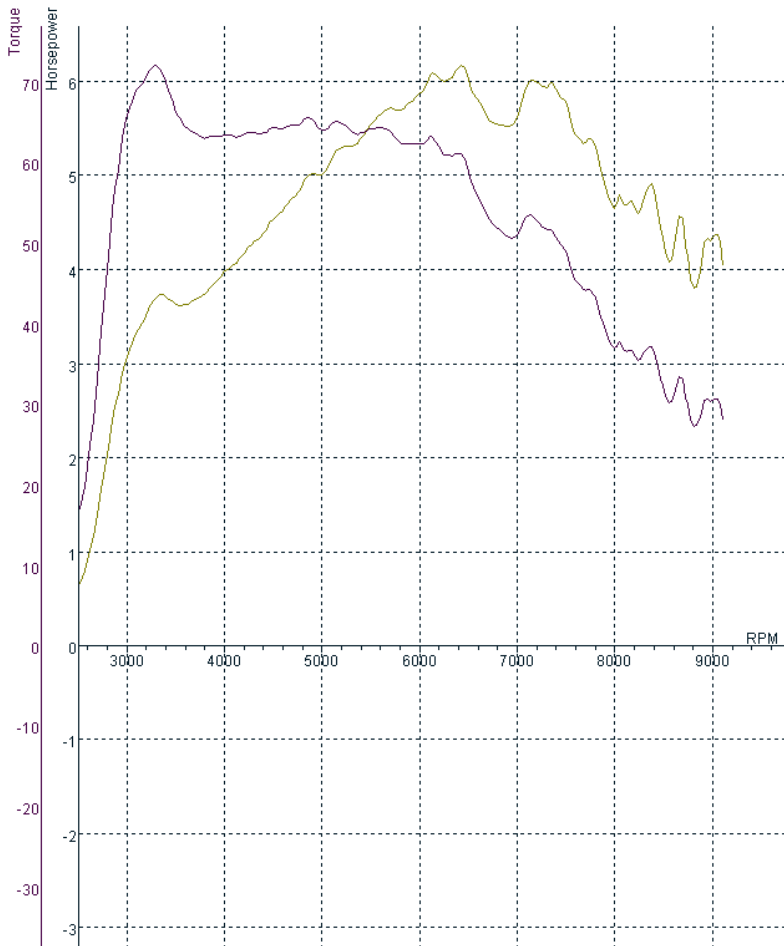
**LOSSES:** 0.0 HP 0.0N\*M  
**TOTAL ENGINE:** 6.1HP 66.85N\*M



**SPORTDYNO V3.3**  
**DYNAMOMETER: SD325**  
**ROLLER INERTIA: 4.6**

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

TEST NAME	MAX POWER	MAX TORQUE	Temp. °C	Humidity %	Pressure	KMH	Date/Time
VEGA R GIGI 4 TEST 001	6.2 (8.2) / 6427	72.09 (72.09) / 3292	30.9 °C	69 %	1000.0 mbar	62.1	1/1/2002 2:07:55 AM



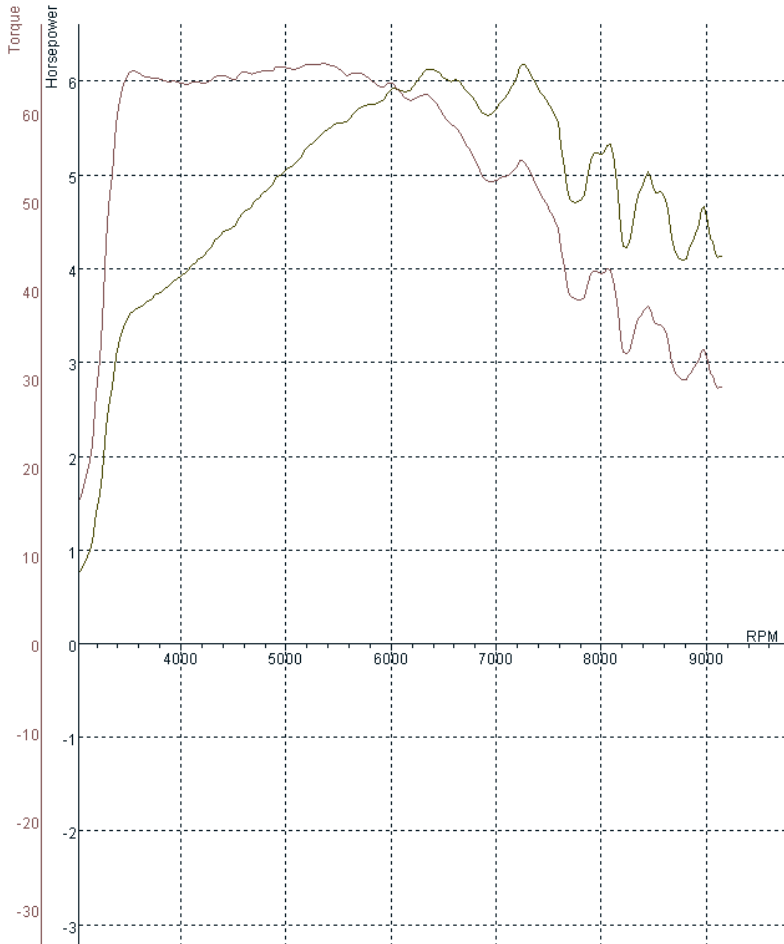




**SPORIDYNO V3.3**  
**DYNAMOMETER: SD325**  
**ROLLER INERTIA: 4.6**

Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

TEST NAME	MAX POWER	MAX TORQUE	Temp. °C	Humidity %	Pressure	KMH	Date/Time
VEGA R GIGI 4 TEST 002	6.2 (6.2) / 7261	65.62 (65.62) / 5346	30.9 °C	69 %	1000.0 mbar	61.9	1/1/2002 2:08:16 AM

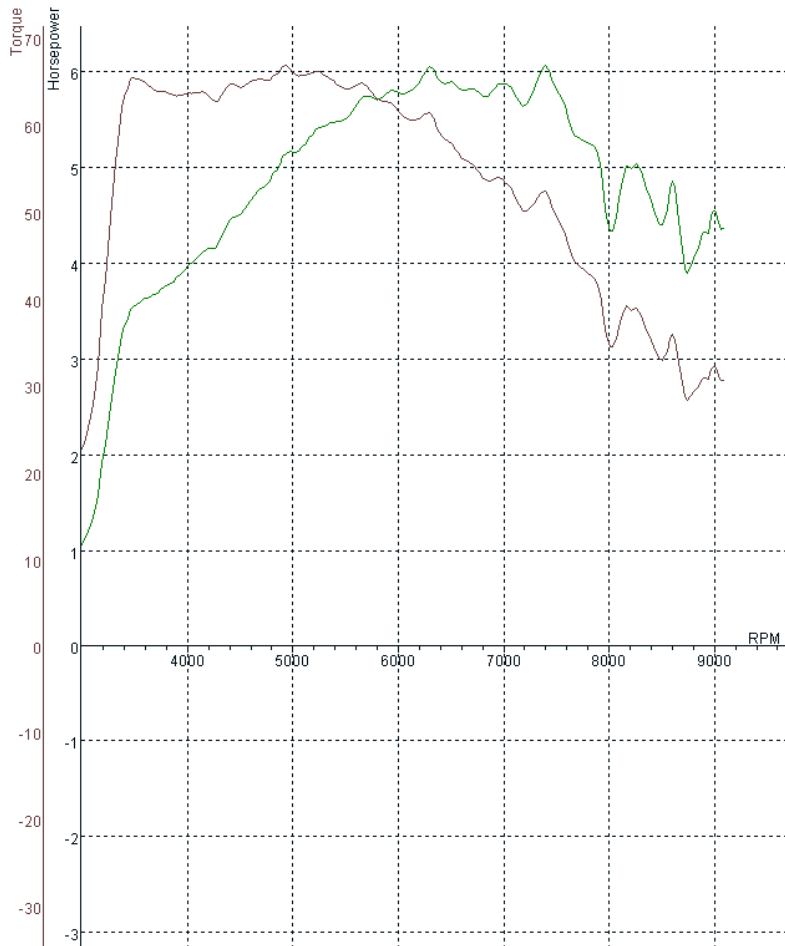


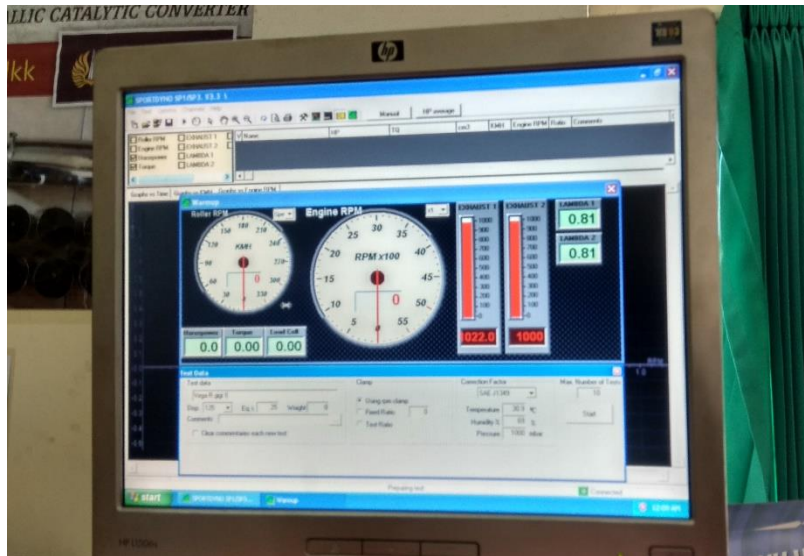


**SPORTDYNO V3.3**  
**DYNAMOMETER: SD325**  
**ROLLER INERTIA: 4.6**

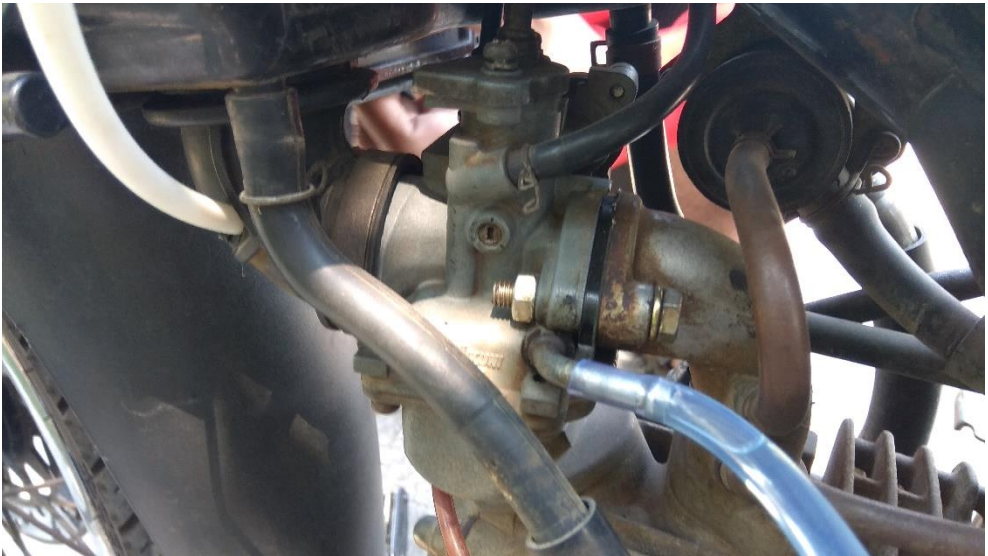
Displacement Correction  
 Correction Factor: SAE J1349  
 NOTE: Load Cell Included.  
 NOTE: Torque is measured at roller.

TEST NAME	MAX POWER	MAX TORQUE	Temp. °C	Humidity %	Pressure	KMH	Date/Time
VEGA R GIGI 4 TEST 003	6.1 (6.1) / 7392	66.85 (66.85) / 4935	30.9 °C	69 %	1000.0 mbar	61.8	1/1/2002 2:08:37 AM

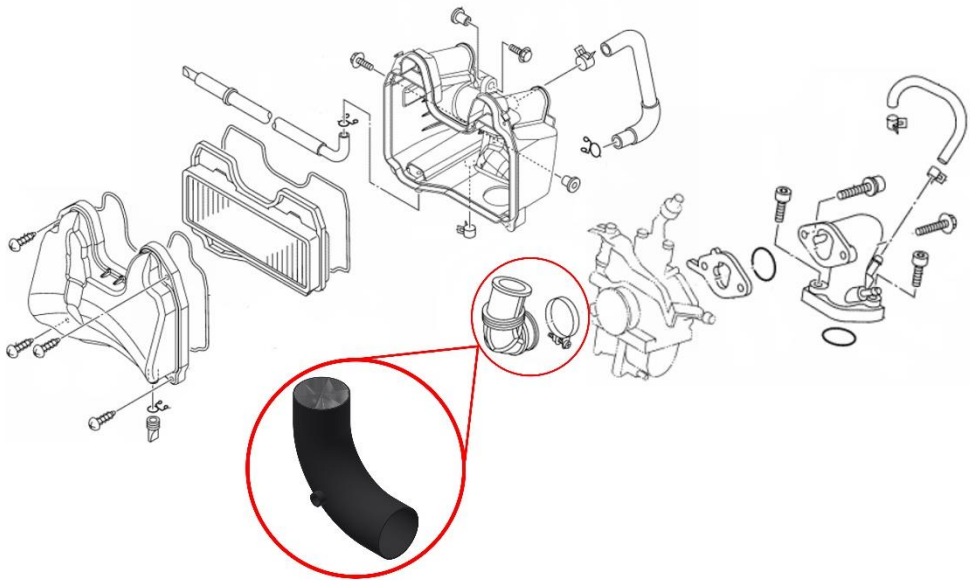


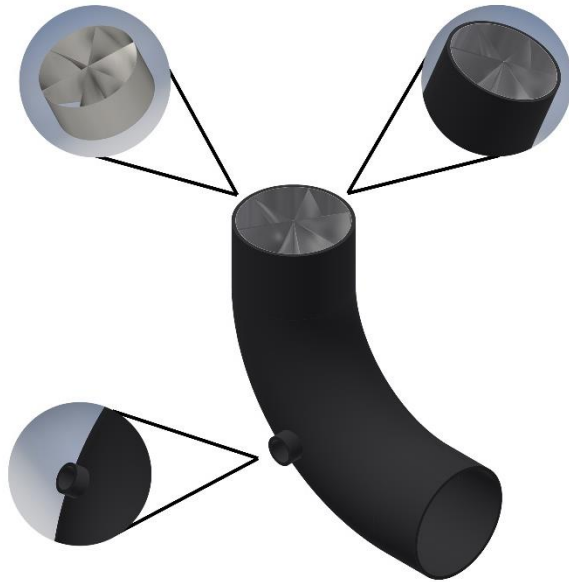




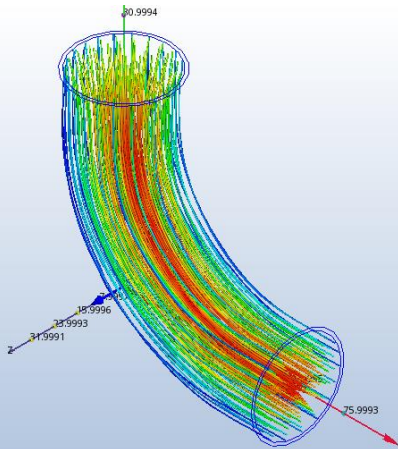
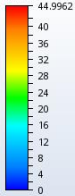








(1) Velocity Magnitude - mm/s



Frame: 100/100



