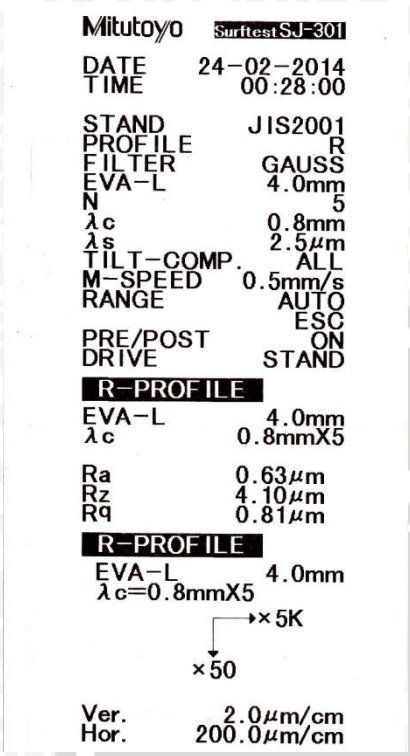
LAMPIRAN

Lampiran 1. Nilai Kekasaran Permukaan


Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 00:28:00

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

R-PROFILE

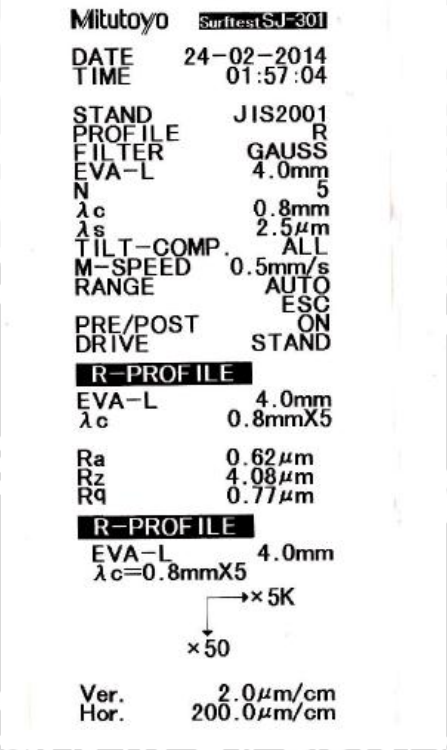
EVA-L 4.0mm
λc 0.8mmX5

Ra 0.63μm
Rz 4.10μm
Rq 0.81μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5
→×5K
×50

Ver. 2.0μm/cm
Hor. 200.0μm/cm


Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 01:57:04

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

R-PROFILE

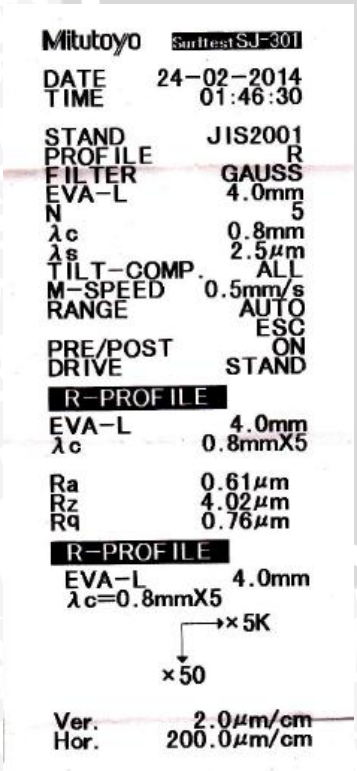
EVA-L 4.0mm
λc 0.8mmX5

Ra 0.62μm
Rz 4.08μm
Rq 0.77μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5
→×5K
×50

Ver. 2.0μm/cm
Hor. 200.0μm/cm


Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 01:46:30

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

R-PROFILE

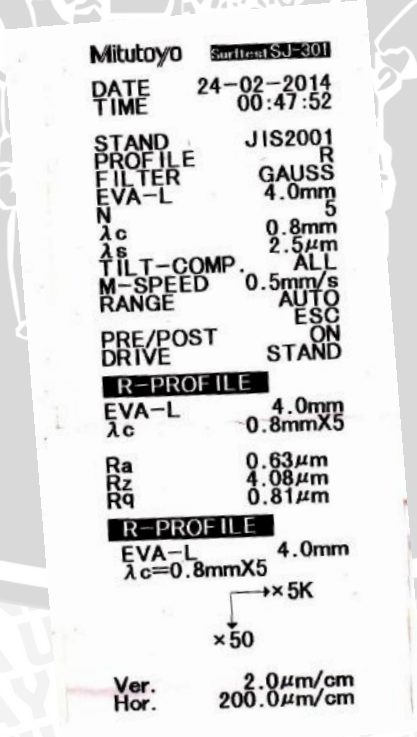
EVA-L 4.0mm
λc 0.8mmX5

Ra 0.61μm
Rz 4.02μm
Rq 0.76μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5
→×5K
×50

Ver. 2.0μm/cm
Hor. 200.0μm/cm


Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 00:47:52

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

R-PROFILE

EVA-L 4.0mm
λc 0.8mmX5

Ra 0.63μm
Rz 4.08μm
Rq 0.81μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5
→×5K
×50

Ver. 2.0μm/cm
Hor. 200.0μm/cm

Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 01:32:44

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

R-PROFILE

EVA-L 4.0mm
λc 0.8mmX5

Ra 0.68μm
Rz 4.66μm
Rq 0.84μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5

→×5K
×50

Ver. 2.0μm/cm
Hor. 200.0μm/cm

Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 01:22:22

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

R-PROFILE

EVA-L 4.0mm
λc 0.8mmX5

Ra 0.72μm
Rz 5.55μm
Rq 0.97μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5

→×2K
×50

Ver. 5.0μm/cm
Hor. 200.0μm/cm

Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 01:24:10

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

R-PROFILE

EVA-L 4.0mm
λc 0.8mmX5

Ra 0.69μm
Rz 4.68μm
Rq 0.88μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5

→×5K
×50

Ver. 2.0μm/cm
Hor. 200.0μm/cm

Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 00:50:23

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

R-PROFILE

EVA-L 4.0mm
λc 0.8mmX5

Ra 0.70μm
Rz 4.87μm
Rq 0.89μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5

→×2K
×50

Ver. 5.0μm/cm
Hor. 200.0μm/cm

Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 01:52:55

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

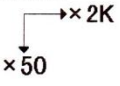
R-PROFILE

EVA-L 4.0mm
λc 0.8mmX5

Ra 0.79μm
Rz 6.05μm
Rq 1.07μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5



Ver. 5.0μm/cm
Hor. 200.0μm/cm

Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 01:28:54

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

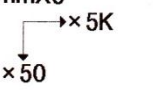
R-PROFILE

EVA-L 4.0mm
λc 0.8mmX5

Ra 0.82μm
Rz 5.17μm
Rq 1.01μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5



Ver. 2.0μm/cm
Hor. 200.0μm/cm

Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 01:20:22

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

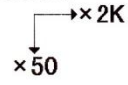
R-PROFILE

EVA-L 4.0mm
λc 0.8mmX5

Ra 0.80μm
Rz 5.25μm
Rq 1.05μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5



Ver. 5.0μm/cm
Hor. 200.0μm/cm

Mitutoyo Surftest SJ-301

DATE 24-02-2014
TIME 01:17:55

STAND JIS2001
PROFILE R
FILTER GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
TILT-COMP. ALL
M-SPEED 0.5mm/s
RANGE AUTO
ESC
PRE/POST ON
DRIVE STAND

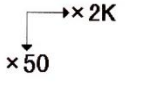
R-PROFILE

EVA-L 4.0mm
λc 0.8mmX5

Ra 0.78μm
Rz 6.23μm
Rq 1.03μm

R-PROFILE

EVA-L 4.0mm
λc=0.8mmX5



Ver. 5.0μm/cm
Hor. 200.0μm/cm

Lampiran 2. Sertifikat Bahan Pengujian

MILL TEST CERTIFICATE (EN10204/3.1.B)

CUSTOMER:
PRODUCT: CARBON STEEL SEAMLESS PIPE

SPEC: ASTM A106 GR.B/ASTM A53 GR.B/API 5L GR.B

INVOICE NO.: SY061213
CERT. NO.: 701-112

PACKING IN BUNDLES

NO.	HEAT NO. 炉号	BATCH NO. 批号	STEEL GRADE 钢号	SIZE Mm 尺寸	PIECES 支数	WEIGHT kg 重量	CHEMICAL COMPOSITION% 化学成分 C	Mn	S	P	Si	Cr	Ni	Cu	Mo	V
1	WB6-9510	0612302	20#	1-1/2"*SCH80*6000MM	366	11210	0.20	0.55	0.011	0.007	0.22	0.03	0.05	0.10	-	-
2	WB6-9515	0612303	20#	2"*SCH40*6000MM	1647	52100	0.19	0.50	0.008	0.013	0.21	0.03	0.05	0.02	-	-
3	WB6-1439	0612304	20#	2"*SCH80*6000MM	463	20230	0.18	0.54	0.007	0.006	0.20	0.05	0.03	0.03	-	-
4	WB6-9784	0612305	20#	2-1/2*SCH40*6000MM	555	27410	0.23	0.50	0.007	0.015	0.25	0.01	0.02	0.02	-	-
5	WB6-9784	0612306	20#	2-1/2"*SCH80*6000MM	285	19380	0.22	0.51	0.010	0.011	0.21	0.03	0.02	0.05	-	-

NO.	MECHANICAL PROPERTIES 机械性能 YIELD POINT σ_s MPa 屈服	TENSION σ_b MPa 抗拉	ELONGATION δ_s% 延伸	IMPACT TEST	HARDNESS HRB	TECHNOLOGICAL PROPERTIES 技术性能 REVERSE FLATTENING TEST	FLATTENING TEST 压扁	FLARING TEST 扩口	NONDESTRUCTIVE TEST 无损探伤 100% E.T. 涡流探伤	H.T. 水压	SURFACE QUALITY 表面质量 IN 内部	OUT 外部	DIMENSION TOLERANCE 尺寸公差 O.D/W.T/L.G 外径/壁厚/长度
1	320/325	475/480	33/34	--	--	--	GOOD	GOOD	GOOD	--	GOOD	GOOD	GOOD
2	325/320	475/480	34/33	--	--	--	GOOD	GOOD	GOOD	--	GOOD	GOOD	GOOD
3	315/320	465/470	35/34	--	--	--	GOOD	GOOD	GOOD	--	GOOD	GOOD	GOOD
4	335/330	485/480	32/32	--	--	--	GOOD	GOOD	GOOD	--	GOOD	GOOD	GOOD
5	320/325	475/480	33/32	--	--	--	GOOD	GOOD	GOOD	--	GOOD	GOOD	GOOD

REMARKS:

Q/C MANAGER: STAMPER:

Lampiran 3. *Pipe Specification* API 5L

INDEPENDENT Pipe and Supply Corp.

Pipe Specification API 5L

Specification	**API 5L** NPS 1/8 -- 26
Scope	Covers WELDED and SEAMLESS pipe suitable for use in conveying gas, water, and oil in both the oil and natural gas industries.
Kinds of Steel Permitted For Pipe Material	Open-hearth Basic-oxygen Electric-furnace
Hot-Dipped Galvanizing	May be ordered galvanized.
Permissible Variations in Wall Thickness	Grade A, B, A25 / X42 through X80 NPS 2 1/2 and smaller -- Seamless and welded, % +20 -- 12.5 / +15 -- 12.5 NPS 3 -- Seamless and welded, % +18 -- 12.5 / +15 -- 12.5 NPS 4 through 18 -- Seamless and welded, % +15 -- 12.5 / +15 -- 12.5 NPS 20 and larger -- Welded, % +17.5 – 10.0 / +19.5 -- 8.0 NPS 20 and larger – Seamless, % +15.0 -- 12.5 / +17.5 -- 10.0
Chemical Requirements	C max % / Mn max % / P max % / S max % Seamless or ERW Grade A 0.25 / 0.95 / 0.05 / 0.06 Grade B 0.30 / 1.20 / 0.05 / 0.06 Continuous-weld - / - / 0.08 / 0.06
Tensile Requirements	Lists minimum yield and tensile strength for all grads as well as a maximum tensile strength for X80. Maximum yield-to-tensile ratios outlined for cold-expanded pipe--may be waived when a fracture toughness requirement is specified.
Hydrostatic Testing	Lists hydrostatic inspection test pressures for all sizes and grades covered by the specification. Test Pressures are held for not less than: Seamless (all sizes) – 5 seconds Welded (NPS 18 and smaller) -- 5 seconds (NPS 20 and larger) -- 10 seconds
Permissible Variations in Weights per Foot	For each length of Standard Weight, Regular Weight, Extra Strong, and Double Extra Strong -- Not more than plus 10% minus 3.5%. For Special Plain End – Not more than plus 10% minus 5%. For Carload Lots – Not more than minus 1.75%.
Permissible Variations in Outside Diameter	**Outside Diameter** at any point shall not vary from standard specified more than: **Sizes** / **Over** / **Under** NPS 1 1/2 and smaller 1/64" 1/32" NPS 2 through 4 1% 1% (Buttweld Only) NPS 2 through 18 .75% .75% NPS 20 through 26 Non-expanded 1% 1%
Mechanical Tests Specified	**Tensile Test** Seamless and Buttwelded -- All Sizes -- Longitudinal Specimens Electric Weld – NPS 6 and smaller -- Longitudinal NPS 8 and Larger -- Transverse **Bending Test** (Cold) – 2" and smaller Buttweld. **Degree of Bend** / **Diameter of Mandrel** For all API Uses 90 12 x OD of pipe
Number of Tests Required	**NPS** / **On One Length From Each Lot of** **Tensile** 5 and smaller 40 or less 6 through 12 200 or less 14 and larger 100 or less 2 and smaller (Buttweld) 25 tons or less **Bending** 1 1/2 and smaller (Buttweld) 50 tons or less **Flattening** Non-Expanded Electric-Weld for single lengths crop ends from each length. For multiple lengths, crop ends from each length, plus 2 intermediate rings.
Lengths	**Threaded & Coupled Pipe** / **Shortest Length In Entire Shipment** / **Shortest Length in 95% of Entire Shipment** / **Minimum Average Length of Entire Shipment** Single Random 16' 0" 18' 0" -- Double Random 22' 0" -- 35' 0"
Required Markings on Each Length (On Tags attached to each Bundle in case of Bundled Pipe)	**Paint Stenciled or Die Stamped (by agreement).** Manufacturer's name or mark. Spec 5L, size, weight per foot, grade, process of manufacture, type of steel, length (NPS 4 and larger only). Test pressure when higher than labulated(NPS 2 and larger only). Heat treat symbols, as applicable -- HN, HS, HA or HQ.
General Information	**Supplementary Requirements available when specified.** SR5--Charpy impact Testing--Welded Pipe 20" & larger--Grade X52 or higher. SR3 -- Color Identification. SR6 -- Drop Weight Tear Testing--Welded Pipe 20" & larger--Grade X52 or higher. SR4 -- Nondestructive Inspection of Seamless Pipe. SR8 -- Fracture Tough ness Testing of Line Pipe.

Lampiran 4. ASTM G1 *Standard Practice for Preparing, Cleaning, and Evaluation Corrosion Test Specimens*

ASTM G1

Standard Practice for Preparing, Cleaning, and Evaluation Corrosion Test Specimens