



PT. PINDAD (PERSERO)





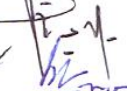


## MACHINE SPECIFICATION

FOR

### 3D PRINTING MACHINE

(FOR PRODUCER)

MS NO. : MS-014-3D Printing-2016

PREPARED BY		CHECKED BY	APPROVED BY	REVISION		
				NO	DATE	SIGNATURE
POSITION	SECRETARY OF PMN 2015 PRODUCT DEVELOPMENT DIVISION	TEAM OF PMN 2015 PRODUCT DEVELOPMENT DIVISION	VICE PRESIDENT PRODUCT DEVELOPMENT	1	July 19, 2017	
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DATE	November 21, 2016	November 21, 2016	November 21, 2016	3		
SIGNATURE	1.  2. 	1.  2.  3.  4. 		4		
				5		

Issue Date : November 21 , 2016

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Product	<b>3D Printing Machine</b>	Revision	-	Effective Date	<b>November 21, 2016</b>
<b><u>Table of Content</u></b>					
Para No.	Description			Sheet No.	
<b>1</b>	<b>Scope</b>			3	
<b>2</b>	<b>Applicable Documents</b>			3	
2.1	Certificate of Origin				
2.2	Quality Control Document of Machine				
<b>3</b>	<b>Requirements</b>			4	
3.1	Physical Characteristics				
3.1.1	Basic Machine Equipment				
3.1.2	Electrical Power Supply				
3.1.3	Optional Feature				
3.1.4	Mechanical Tool Kit				
3.1.5	Documentations				
3.2	Performance Characteristics				
3.2.1	Efficiency				
3.2.2	Product Output				
3.3	Preservation and Packing				
3.4	Another Specification				
<b>4</b>	<b>Quality assurance Provisions</b>			6	
4.1	Conformance to Requirements				
4.2	Commissioning Procedures				
4.2.1	Visual Inspection				
4.2.2	Functional Inspection				
File Name : 2.5 MS-PMN2015-3D Printing Machine		<b>MACHINE SPECIFICATION</b>		Sheet 2 of 7	

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<b>3D Printing Machine</b>	-	<b>November 21, 2016</b>
<p><b>1. SCOPE</b> This specification covers the requirements and conditions of admission to the 3D Printing Machine.</p> <p><b>2. APPLICABLE DOCUMENTS</b> The following lists the documents referred to in this specification. These documents shall form part of this specification to the extent specified herein. In the case of requirements in these documents differing from the requirements indicated in this specification, this specification shall always have precedence.</p> <p>2.1 Certificate of origin This document is referred to the origin of the country where the machine is manufactured.</p> <p>2.2 Quality Control Document of the machine from manufacture To convenience that the machine is passes the Quality control.</p>		
File Name : 2.5 MS-PMN2015-3D Printing Machine	MACHINE SPECIFICATION	Sheet 3 of 7

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<p><b>3. REQUIREMENTS</b></p> <p>3.1. <u>Physical Characteristics</u></p> <p>3.1.1 <u>Basic Machine Equipment</u></p> <p>The machine shall be manufactured consisting of</p> <ol style="list-style-type: none"> <li>1. Build size : 490 x 390 x 200 mm</li> <li>2. Support materials : SUP 705 non toxic-gel-like Photopolymer support</li> <li>3. Layer thickness (min) : Horizontal build layers as fine as 16 microns</li> <li>4. Workstation compatibility: windows 7 and windows 8</li> <li>5. System size &amp; weight : 1400 x 1260 x 1100 mm (430 kg) Material Cabinet : 330 x 1170 x 640 mm (76 kg)</li> <li>6. Operating condition : Temperature 18 – 25 °C, Relative humidity 30–70%(non condensing)</li> <li>7. Model materials : Rigid opaque : Vero family including color Rubber-like : Tango family including color and translucent Transparent : RGD720 and Veroclear Simulated polypropylene (Endur and Durus) Bio-compatible High temperature</li> <li>8. Digital materials : Digital ABS and digital ABS2 in ivory and green, Hundreds of vibrant, repeatable color in opaque and translucent, Rubber-like blends in a range of Shore A values and colors, Simulated polypropylene materials with improved heat resistance</li> <li>9. Material option : Over 1000 (with additional thousand using creative colors software)</li> <li>10. Resolution : X-axis : 600 dpi, Y-axis : 600 dpi, Z-axis : 1600 dpi</li> <li>11. Accuracy : 20 – 85 microns for features &lt;50 mm Up to 200 microns for full model size</li> <li>12. Build modes : Digital material : 30 microns (0,001 in) resolution High Quality : 16 microns (0,0006 in) resolution High Speed : 30 microns (0,001 in) resolution</li> <li>13. Network connectivity : LAN-TCP/IP</li> <li>14. Regulatory compliance: CE, FCC</li> </ol>		
File Name : 2.5 MS-PMN2015-3D Printing Machine	<b>MACHINE SPECIFICATION</b>	Sheet 4 of 7

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<p>3.1.2 <u>Electrical Power Supply</u> 110-240 VAC 50/60 Hz 1,5 kW single phase</p> <p>3.1.3. <u>Optional Feature</u> PC and laptop with engineering spec is required for this machine for support designing</p> <p>3.1.4 <u>Mechanical Tool Kit</u> The machine shall be supplied together with mechanical tool kit consisting of :</p> <ul style="list-style-type: none"> <li>• Special tools</li> <li>• Special maintenance tools essential for removal of assembly / sub-assembly parts or tools (for maintenance or setting of the machine)</li> </ul> <p>3.1.5 <u>Documentation</u> Two (2) sets of technical documentation in English language supplied in print (hard copies) as well as two (2) copies saved on CD and constituting of :</p> <ul style="list-style-type: none"> <li>• CE Declaration of Conformity</li> <li>• Layout of the machine with supply connections</li> <li>• Operating manual</li> <li>• Maintenance manual</li> <li>• Back up parameter</li> </ul> <p>3.2 <u>Performance Characteristics</u></p> <p>3.2.1 <u>Efficiency</u> The efficiency factor does not include down time due to non-availability of utilities (electrical power, compressed air, water and other service facilities) as well as non-availability of materials (input materials quantity and quality and consumables) and breakdown time of the machine due to handling mistake by the operator.</p> <p>3.2.2 <u>Product Output</u> The product output shall meet Pindad's requirements (product drawing).</p> <p>3.3 <u>Preservation and Packaging</u> The machine shall be packed in seaworthy packing and shall be able to prevent any damages and corrosion during transportation and storage for 6 months as from date of shipment. The packing details issued by Producer/Supplier and agreed by Buyer. The supplier shall ensure no short packing of equipment or components.</p> <p>3.4 <u>Another specification</u></p> <ul style="list-style-type: none"> <li>• Operational and maintenance training</li> <li>• Availability of spare part for 15 years in Indonesia</li> <li>• The after sales guarantee</li> <li>• Qualified technicians available in Indonesia</li> <li>• Machine guarantee and maintenance guarantee</li> <li>• User preference machine manufacturer from Europe, USA, South Korea, Japan or equal</li> </ul>		
File Name : 2.5 MS-PMN2015-3D Printing Machine	MACHINE SPECIFICATION	Sheet 5 of 7

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<p><b>4. <u>QUALITY ASSURANCE PROVISIONS</u></b></p> <p>4.1 <u>Conformance to requirements</u> The supplier shall be responsible to ensure that the supplied components conform to all the requirements stated in paragraph 3 of this specification and Pindad quality requirements.</p> <p>4.2 <u>Commissioning Procedures</u></p> <p>4.2.1 Visual Inspection Checking for the completeness (quality and quantity) of parameters as:</p> <ol style="list-style-type: none"> <li>1. Machine physical conditions, according to part 3 (Requirements) of this machine specification</li> <li>2. Spare parts, tools and gauges, according to part list from OEM (Original Equipment Manufacturer).</li> <li>3. Documents supplied altogether with the machine.</li> </ol> <p>4.2.2 Functional Inspection Checking for the full functioning of the machine supplied, with steps as following:</p> <ol style="list-style-type: none"> <li>1. Try run after installation Machine shall be running without product for 24 hours. Within this try run period, the machine will be checked whether it is running without abnormality after 24 hours.</li> <li>2. Try out/ production test Machine shall be running with product feeding to produce try out lots.</li> </ol>		
File Name : 2.5 MS-PMN2015-3D Printing Machine	<b>MACHINE SPECIFICATION</b>	Sheet 6 of 7

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NO (Nr)	MATA UJI (Inspection Item)	SPEKIFIKASI (Specification)	ALAT UKUR (Equipment)	FREKWENSI (Frequency)	PROSEDUR /DOKUMEN (Reference/Document)	SENSUS/ SAMPLING (Census/Sampling)	KRITERIA MUTU (K/MA/MI) Criteria (C/Ma/Mi)
<b>A. Visual Inspection</b>							
	Visual Conditions	<ul style="list-style-type: none"> <li>● Physical Machine</li> <li>● Spare part</li> <li>● Tools &amp; Gauge</li> <li>● Document : <ul style="list-style-type: none"> <li>➢ Manual Book</li> <li>➢ Technical Data</li> <li>➢ Specification</li> </ul> </li> </ul>	Visual	100%	N/A	Census	C
<b>B. Function Inspection</b>							
1.	Try Run after Installation	Successful machine operation for 24 hours continuously without material	Visual	100%	-	Census	MA
2.	Try Out / production test	Successful machine result the product according the input design and running well	Visual	100%	-	Census	MA
File Name : 2.5 MS-PMN2015-3D Printing Machine		MACHINE SPECIFICATION				Sheet 7 of 7	

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