



PT. PINDAD (PERSERO)





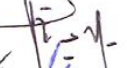


MACHINE SPECIFICATION

FOR

WATER JET CUTTING MACHINE

(FOR PRODUCER)

MS NO. : MS-013-Waterjet Cutting-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		
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Issue Date : November 21 , 2016

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<p>1. SCOPE This specification covers the requirements and conditions of admission to the Water jet Cutting Machine.</p> <p>2. APPLICABLE DOCUMENTS 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>		

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3. REQUIREMENTS 3.1. <u>Physical Characteristics</u> 3.1.1 <u>Basic Machine Equipment</u> The machine shall be manufactured consisting of <ul style="list-style-type: none"> 1. Linear straightness accuracy : 0,0381 mm/1 m 2. Cut speed : 7,6 m/min 3. Traverse speed : 12,7 m/min 4. Repeatability : 0,050 mm 5. Z travel : 178 mm 6. Size : 3 m x 2 m 7. Cutting envelope : <ul style="list-style-type: none"> - Machine spec <ul style="list-style-type: none"> • Work envelope : 3 m x 2 m • LCD Monitor : Available - Machine positional spec <ul style="list-style-type: none"> • Linear positional accuracy : ±0,08 mm/M • Repeatability : ±0,05 mm/M • Industrial PC based controller/servo drive system : Available • Contouring speed (single head) : 7,62 m/min 8. Cleancut material support system : <ul style="list-style-type: none"> - Load : 1000 kg/m² - Waste water overflow control : Available - Easy access to grating system : Available - Water level control function : Available - Able to waterVeyor waste removal system : Available - Water flush gun and air blower include : Available 9. Abrasive Delivery Hopper : Available 10. Intensifier pump system : <ul style="list-style-type: none"> - Pump type : intensifier with ceramic plunger - Pump power rating : Single, 50 HP, 220-440 V 50/60 Hz electric motor - Output pressure : 60000 psi (4127 bar) - Flow rate : 1 gallon/minute @60000 psi - Water booster : Available - Automatic high pressure bleed down valve to relieve system water pressure to 0 psi when shutting down the pump : Available - Full electronic pressure control : Available - Support orifice diameter usage : 0,357 mm 		

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11. Cutting thickness : up to > 250 mm 12. Part precision : $\pm 0,025 - 0,07$ mm 13. High grade accessories upgrade : <ul style="list-style-type: none"> - Ultra perice vacuum assist - Pure water jet conversion kit - Dynamic contour follower - Laser edge pointer - Abrasive removal system - Low profile fixture clamps : adjustable to hold material From thin sheet to 1,5" thick 14. Intensifier pump consumables kit 50 HP : <ul style="list-style-type: none"> - Seal kit ; 60K ; H.P - Repair kit; inten CHK VLV;ESL - Seal kit;LP;60K ESL INTENS - Blue lubricant; anti-squeeze agent - Bleed down valve repair kit - Filter, cartridge; 0.45 Micron absolute grade - Filter, cartridge; 1,0 Micron absolute grade 15. Cutting head consumable parts : <ul style="list-style-type: none"> - Spray Shield - Blast Disk - Mixing Tube Assy; ECL PRM .03" ID 4" Length - Abrasive Jet Orifice Assy; Paser ECL; .013 ID - Abrasive Jet Orifice Assy; Duraflow; .013 ID - Water Only Orifice Assy; .009", Plastic - Water Only Orifice Assy; .009", Diamond 16. Cutting head ON/OFF Valves repair kit <ul style="list-style-type: none"> - Seal Kit; Universal Valve; 87K 17. Software option : <ul style="list-style-type: none"> - Available 18. Water Treatment Options <ul style="list-style-type: none"> - Air Compressor & Temperature Refrigerated Air Dryer - Assembled Water Chiller - Water Softener - 10 Micron Pre-Filter Element - 5 Micron Pre-Filter Element - Water Plastic Tank - UPS - Instalation Pipe - Gamat Mesh #80 		
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<p>3.1.2 <u>Electrical Power Supply</u></p> <ul style="list-style-type: none"> • 3-phase, 380 V, 50 Hz <p>3.1.3 <u>Optional Feature</u></p> <p>PC and laptop with engineering spec is required for this machine for support designing</p> <p>3.1.4 <u>Mechanical Tool Kit</u></p> <p>The machine shall be supplied together with mechanical tool kit consisting of :</p> <ul style="list-style-type: none"> • Special tools • Special maintenance tools essential for removal of assembly / sub-assembly parts or tools (for maintenance or setting of the machine) <p>3.1.5 <u>Documentation</u></p> <p>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"> • CE Declaration of Conformity • Layout of the machine with supply connections • Operating manual • Maintenance manual • Back up parameter <p>3.2 <u>Performance Characteristics</u></p> <p>3.2.1 <u>Efficiency</u></p> <p>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></p> <p>The product output shall meet Pindad's requirements (product drawing).</p> <p>3.3 <u>Preservation and Packaging</u></p> <p>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.</p> <p>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"> • Operational and maintenance training • Availability of spare part for 15 years in Indonesia • The after sales guarantee • Qualified technicians available in Indonesia • Machine guarantee and maintenance guarantee • User preference machine manufacturer from Europe, USA, South Korea, Japan or equal 		

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<p>4. <u>QUALITY ASSURANCE PROVISIONS</u></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"> 1. Machine physical conditions, according to part 3 (Requirements) of this machine specification 2. Spare parts, tools and gauges, according to part list from OEM (Original Equipment Manufacturer). 3. Documents supplied altogether with the machine. <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"> 1. Laser testing for X,Y,Z,A, C Axis and repeatability 2. Try run after installation Machine shall be running without product 24 hours non-stop (3 shifts @8 hours continuously). Within this try run period, the machine will be checked whether it is running without abnormality for 24 hours. 3. Try out/ production test Machine shall be running with product feeding to produce try out lots. <p>The Cp and efficiency will be calculated for each step. If the Cp and efficiency of one step doesn't match Pindad's requirement, the test will be repeated in the same step.</p>		

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Product Water jet Cutting Machine					Revision -	Effective Date November 21, 2016	
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)
A.	Visual Inspection						
	Visual Conditions	<ul style="list-style-type: none"> Physical Machine Spare part Tools & Gauge Document : <ul style="list-style-type: none"> ➤ Manual Book ➤ Technical Data ➤ Specification 	Visual	100%	N/A	Census	C
B.	Function Inspection						
1.	Laser testing for X,Y,Z,A,C axis and repeatability	Precision	Laser	100%	Machine document	Census	C
2.	Try Run after Installation	Successful machine operation for 24 hours continuously without material	Visual	100%	-	Census	MA
3.	Try Out / production test	Successful machine result the product according the input design and running well	Visual	100%	-	Census	MA
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