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Plasma Systems Inc. | 11601 N. Houston Rosslyn Rd. | Houston, TX 77086 | Phone: 832-243-9900





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Cutting Edge Design InSight Controller Rapid Part Technology True Hole True Bevel XPR Technology

Plasma Systems, Inc. 11601 N. Houston Rosslyn Rd. Houston, Texas 77086 Phone: 832-243-9900 Fax: 832-243-9901 sales@plasmasystemsinc.com





Proven Systems and Outstanding Service

Plasma Systems, Inc. machines are built to perform. From raw metals through to the finished machine, PSI insists upon quality at every step, resulting in a product that is strong, reliable and built to last.

Plasma Systems, Inc. shape cutting machines are built to deliver high accuracy, repeatability and durability. Plasma Systems, Inc. is defined not only by it's machines but by its outstanding service and applications. We are a factory direct OEM. We carry replacement parts for next day delivery and have a fleet of fully stocked service trucks providing installation and ongoing service. Our Application and Sales Engineers have the experience to help you select the best machine for your application and provide turn-key solutions and training.



Field Services:

Plasma Systems Field Service Technicians have the technical training as well as extensive factory training in the use of Plasma Systems equipment and OEM products.

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- Emergency field support with an average response time of 24 hours or less
- New equipment installation and start-up service
- Comprehensive training for machine operators and maintenance personnel
- Equipment enhancement, we have the capability to modify, upgrade and enhance systems to meet customers changing needs and increase system performance and productivity

Remote Support:

Leading the way in service, our technicians have the capability to remotely run and check system diagnostics. If our technicians are able to remotely fix the issue, it saves your company the cost and downtime associated with a field technicians visit. This has proven to be a great tool. Our team, one of the pioneers in this service, is here to support you.

- Fast and secure connectivity
- Safe remote access to the InSight Controller to view and modify setups
- Login via a phone application and monitor production



Clearcut advantages of InSight Controller

- -Windows based open architecture
- -EtherCat based I/O System
- -Full interactive nesting on every control
- -Real time 3D viewing of CNC machine and plate
- -Automatic plate skewing and measuring
- (measured by laser technology)
- -Automatic laser measuring for plate and torch height
- -Remote diagnostics
- -Mounted camera for real time viewing of parts being cut



The new InSight controller is a leap forward into the future, let us take a look at some of the outstanding features of this amazing controller.

The Windows 10 IOT based open architecture platform, which runs the CNC machine, allows us to customize each controller to your specific needs. Working via an ether-cat based I/O system significantly increases the speed of communication between the machine and the controller. This platform gives the operator the ability to automatically skew the plate at speeds not previously known in the industry. Remnant and cut loss management are made easier via our laser measuring technology. Full interactive nesting includes part-in-part capabilities and also includes an autonesting feature desinged to maximize plate usage.

Should you run into any issues with your plasma CNC Machine, the remote diagnostics feature allows our technicians to remotely diagnose and correct certain issues you may be facing, saving you the cost of a technicians visit. All of these amazing features appear on a single ELO or optional twin 22in touch screens which are great for displaying a Windows 10 IOT, Active K 3D Graphics User Interface.



Software Highlights

- -Windows 10 IOT Operating System
- -Rapid Part Technology
- -True Hole Technology
- -True Bevel Technology
- -Steel Solutions nesting software
- -Full interactive nesting
- -Optimized Nesting Features
- -Job Forecasting
- -Built in customizable part library
- -3D part viewing
- -Plate remnant management
- -Real time remote tracking of productivity
- -Diagnostic support tools

InSights 2D & 3D Part Viewing

- Check parts in 2D which incudes a split-view and a tab-view
- View parts rendered in full 3D to see the finished part
- Import parts in multiple formats







Rapid Part technology delivers superior performance for your operators, your company, and your bottom line.

Achieve greater productivity by reducing cut-to-cut cycle time. Rapid Part[™] controls and optimizes every step in the plasma cutting process – without operator intervention – so you can focus on your business and your customers.

- Increases the number of parts produced per hour by up to 100%.
- Delivers cut-to-cut cycle time reduction automatically without operator intervention.

Total part time (20.3 cm [8"] flance with 8 holes) Red = 80% reduction: 50% reduction overall 80 70 Cutting 60 Not cuttina 50 40 30 20 10 N Without Rapid Part With Rapid Part

Less cut-to-cut cycle time means increased productivity

- Cutting a 20.3 cm (8") flange, more than half the time after the operator presses "go" is spent moving between cuts when using competitive THCs.
- Rapid Part technology, part of Hypertherm's SureCut[™] technology, which is embedded within our InSight controller, reduces the cut-to-cut cycle time by up to 80% and the time it takes to cut each part by about 50%.

Embedded within InSight Controller



Rapid Part technology reduces wasted time in the cutting process

Revolutionary plasma performance: Rapid Part technology

Rapid Part[™] technology works by targeting and optimizing four aspects of the total cutting process that cause longer than necessary cycle time and which occur during the period from the last cut or pierce to the next pierce.

1. Torch retract

Rapid vertical (Z-axis) motion using InSights THC Sense intelligently retracts the torch to the next pierce height, based on material and part properties.

2. Table motion

Optimized motion instructions programmed using Steel Solutions software and its THC systems, minimizes the chances of torch collision and the distance between the end of one cut and the pierce on the next part.

3. Initial height sensing

Rapid Z-axis motion using InSights Lifter and Laser Pulse initial torch height sensing. Automatic fast-to-slow speed crossover calibration. IHS skipped intelligently, based on part geometry and nest configuration.

4. Gas pre-flow

Completed simultaneously during initial height sensing and during machine motion if IHS is skipped.

5. Pierce detect

Automatically detects when the XPR300[™] has pierced the plate on certain thicknesses and torch is ready to move.

Hypertherm, Rapid Part, SureCut, and HyPerformance are trademarks of Hypertherm Inc. and may be registered in the United States and/or other countries.

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Note: The technology featured in this brochure is programmed into our InSight controller. We boast in having one of the most advanced systems currently in the industry. Working with industry leaders, we have engineered a controller which surpasses the competitions capabilities; by using proprietary algorithms to fully take advantage of each component in our machine. The controllers ability is demonstrated by the CNCs precision. We invite you to contact us and reach out to our team for a private demonstration.

Hypertherm's Rapid Part technology achieves maximum results using the following components

- InSight Controller
- Steel Solutions software
- InSight's Laser Pulse initial torch height sensing
- Hypertherm HyPerformance[®] HPRXD[®] or XPR300 system. When purchasing a PSI cutting table be assured you are getting the best cut-to-cut cycle time. We are able to deliver these results using our revolutionary InSight Controller and Steel Solutions software.





With Rapid Part

Without Rapid Part

Parts produced using the same cutting machine, the same cut speed and the same cutting time duration.

Note: Cut-to-cut cycle time improvement will be apparent on all jobs, with the most significant productivity improvements achieved on nests using thin plate with a high part/pierce count.



innovative: featuring new methods; advanced and original







True Hole technology for XPR

True Hole[®], part of Hypertherm's SureCut[™] technology was launched in 2008 with the HPRXD[®] autogas family of products. It is now also offered on Hypertherm's new XPR300[™] system. TrueHole for mild steel produces significantly better hole quality than what has been previously possible using plasma. Equally important, True Hole technology is delivered automatically without operator intervention, to produce unmatched hole quality.



With True Hole technology





Packaged within our InSight controller

Benefits of True Hole for XPR

- Bolt hole quality is delivered automatically without operator intervention
- Narrows the gap with laser hole quality making the plasma process suitable for many jobs previously cut with laser
- Virtually eliminates hole taper
- Improves top and bottom level roundness
- Delivers true "bolt-hole" quality



True Hole technology requires a Hyperformance® Plasma HPRXD® or XPR300^w system along with a True Hole enabled cutting machine. Consult with your machine manufacturer for more details on specific components you may require.

Note: HPRXD must be autogas configuration only

True Hole performance is optimized through seamless integration of all of the components.

Revolutionary plasma performance: True Hole cut quality

As part of Hypertherm's SureCut technology, True Hole[®] for mild steel is exclusively available for use in conjunction with Hypertherm's HPRXD[®] and XPR300[™] plasma systems. True Hole is automatically applied by InSight's Steel Solutions nesting software to thicknesses up to 25 mm (1inch). Hole coverage ranges from hole diameter to thickness ratios from 2:1 to as low as 1:1.

True Hole technology is a specific combination of the following parameters that is linked to a given amperage, material type, material thickness and hole size:

- Process gas type
- Gas flow
- Amperage
- Piercing methodology
- Lead in/lead out technique
- · Varying speeds across multiple hole segments
- · Arc termination synchronized with torch motion

10 mm holes, 9.5 mm mild steel plate, 130 A process (0.394" holes, 3/8" mild steel plate)



True Hole processes for XPR by thickness

	3 mm	4 mm	5 mm	6 mm	8 mm	10 mm	12 mm	15 mm	20 mm	22 mm	25 mm
30 A	•										
80 A				•	•	•					
130 A						•	•				
170 A							•				
300 A											

10 ga 3/16" 1/4" 5/16" 3/8" 1/2" 5/8" 3/4" 7/8" 1"

Note: Interpolated hole settings between thicknesses may be possible. Contact your machine manufacturer for details.

Hypertherm

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Benefits Embedded within InSight Controller







True Bevel technology for XPR

True Bevel[™], part of Hypertherm's SureCut[™] technology, was launched in 2012 with the HPRXD[®] family of products. It is now also offered on Hypertherm's new XPR300[®] system. Factory tested and easily implemented, True Bevel takes the guess work out of the plasma bevel-cutting process. With True Bevel, setups for new jobs are quick and results are accurate.

Benefits Embedded within InSight controller.

- Setup time and scrap material are greatly reduced for new job setup due to reduced trial and error.
- Bevel cut sequence recommendation is provided for improved accuracy and consistent quality.
- Scalable parameter tables with embedded equations allow users to add new angles with ease.

True Bevel technology works with all common bevel head designs and covers V, A, and Top-Y style cuts for mild steel:





Bevel angle and land density coverage

True Bevel[™] for XPR300[®] has angle coverage for V and Top Y cuts up to 50° and A cuts up to 45°. The tables contain values for lands ranging from 20% to 50% of the material thickness for Y Top cuts. You can add other angles and land dimensions within the specified ranges into the bevel

process parameter tables for more flexibility. The tables automatically provide newly calculated output values for angle compensation, kerf, cut height, cut speed, and arc voltage.

Thickness coverage - metric units (mm)

	6 mm	8 mm	10 mm	12 mm	15 mm	19 mm	20 mm	22 mm	25 mm	32 mm	38 mm
80 A	Х	Х	Х								
130 A		Х	X	Х	X						
170 A				Х	X	Х	Х	Х			
300 A									X	X	Х

Thickness coverage - English units (inches)

	0.25"	0.312"	0.375"	0.5"	0.625"	0.75"	0.875"	1"	1.25"	1.5"
80 A	Х	Х	Х							
130 A		Х	Х	Х	Х					
170 A				Х	Х	Х	Х			
300 A								X	Х	Х

V-cut and A-cut angle coverage

						Angle*						
V-cut	-50°	-45°	-40°	-37.5°	-35°	-30°	-27.5°	-25°	-22.5°	-20°	-17.5°	-15°
A-cut		45°	40°	37.5°	35°	30°	27.5°	25°	22.5°	20°	17.5°	15°

Top cut angle and land coverage

Y-Top	Angle*	-50		-45		-37.5		-30		-27.5		-22.5						
	Land dimension	20	35	50	20	35	50	20	35	50	20	35	50	20	35	50	20	35

* Angle signs based on negative bias head.

Without True Bevel



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These three parts were job setup iterations during field testing using the existing method that took more than 1 hour to complete. At least one further iteration would be required to obtain an acceptable part.

With True Bevel



This single part was achieved on the first try using True Bevel and is an acceptable part ready to start production.



XPR overview

Unmatched performance. Unbeatable operating cost.

The new XPR[™] plasma represents the most significant advance in mechanized plasma cutting technology, ever. These next generation systems redefine what plasma can do by expanding its capabilities and opportunities in ways never before possible. With unmatched X-Definition[™] cut quality on mild steel, stainless steel and aluminum, XPR increases cut speed, dramatically improves productivity and slashes operating costs. New ease-of-use features and engineered system optimization make XPR easier to run with minimal operator intervention, while also ensuring optimal performance and unmatched reliability.

Industry leading cut quality - X-Definition

The XPR advances HyDefinition[®] cut quality by blending new technology with refined processes for next generation, X-Definition cutting on mild steel, stainless steel and aluminum.

- Consistent ISO range 2 results on thin mild steel
- Extended ISO range 3 cut quality results compared with earlier plasma technology
- Superior stainless steel cut quality across all thickness ranges
- Superior results on aluminum using Vented Water Injection™ (VWI)

Optimized productivity and reduced operating costs

- Dramatic improvement in consumable life on mild steel
 applications
- Thicker piercing capability than competitive plasma systems
- Significantly lower operating costs than previous generation technology
- High quality argon marking using the same cutting consumables

Engineered system optimization

- Ramp down error protection significantly increases realized consumable life
- Reduces the impact of catastrophic electrode blowouts which can damage the torch at high current levels

Ease of use

- Intuitive operation and automatic monitoring redefine ease of use
- Full control of all functions and settings via the CNC
- Automatic system monitoring and specific troubleshooting codes for improved maintenance and service prompts



- EasyConnect[™] torch lead and one hand torch-toreceptacle connection for fast and easy change-outs
- QuickLock[™] electrode for easy consumable replacement
- WiFi in power supply can connect to mobile devices and LAN for multiple system monitoring and service



Industry leading X-Definition cut quality

Torch and consumable technology

X-Definition[™] improves cut quality and consistency on mild steel, expands the application of Hypertherm's pioneering HyDefinition[®] process to a broad range of non-ferrous applications and greatly enhances it with a number of critical new cutting technologies.

Expanded HyDefinition technology

Hypertherm's pioneering HyDefinition[®] technology, featuring a unique two-piece vented nozzle design, aligns and focuses the plasma arc, increasing arc stability and energy density for more consistent, precise cut quality. Previously used primarily on mild steel applications, this foundational technology is now applied to the full range of non-ferrous cutting processes for cleaner, sharper, more consistent edge quality on stainless steel and aluminum.

Vented Water Injection (VWI)

This patent pending process features a vented N_2 plasma and an H_2O shield. Edges are square, angularity is reduced and surface finish is excellent on non ferrous materials, especially aluminum.

Cool nozzle

Patent pending feature on the 300-amp oxygen process provides liquid cooling directly to the nozzle bore. This cooling is a significant factor in increasing cut quality over the life of the consumables by over 40%.

Cool nozzle



**Contact us today for your consumable needs.

Advanced arc stability

Superior arc steadiness from a modified shield gas impingement improves arc stability when coming out of a pierce hole or out of an acute angle delivering reduced lead-in lengths and improved cut quality.

Improved torch geometry

Superior bevel capability and performance thanks to an enhanced tapered torch design that features a 76° included angle and bevel rotation of up to 52°.



True Hole technology

XPR[™] True Hole[®] technology incorporates new arc segmentation protocols to automatically produce bolt hole quality on mild steel with diameter to thickness ratios of 1:1 up to 2:1.

Vent-to-shield technology

This new technology mixes hydrogen reclaimed from the vented plasma gas with the shield gas to reduce angularity and deliver more consistent edge color on stainless steel up to 12 mm (1/2").

Plasma dampening

Patent pending plasma dampening delivers increased arc density and cut speeds on thin stainless while maintaining arc stability and smoother cut edges.

PowerPierce

Patented PowerPierce[®] liquid cooled shield technology repels molten metal during piercing allowing production piercing of 45 mm (1-3/4") on mild steel all the way up to 50 mm (2") on the XPR300 and up to 40 mm (1-9/16") on the XPR170 when using Hypertherm's exclusive argon-assist process.

Process control and delivery.

State-of-the-art process control through a completely new concept in gas and fluid delivery. Three console options – Core™, Vented Water Injection™ (VWI) and OptiMix™ – offer unmatched mild steel cut quality with each console delivering successively enhanced cutting capabilities on stainless steel and aluminum. All consoles can be fully controlled through the CNC for high productivity and ease of use.



Gas-connect console gases/fluids									
	Core	Vented Water Injection (VWI)	OptiMix						
O ₂ /N ₂ /Air	•	•	•						
F5/Ar/H ₂ 0		•	•						
H_2 - N_2 -Ar mixing			•						

$\textbf{Core}^{\texttt{m}} \text{ console}$

Unmatched mild steel cutting performance and superior angularity and edge finish on stainless steel up to 12 mm (1/2"). This is delivered through a new N₂ HDi^m process that prevents the mixing of air into the plasma gas, creating an improved, brighter edge finish.

Vented Water Injection™ (VWI) console

All Core console capabilities plus argon marking and a more than 10% increase in piercing thickness with argon-assist. Significantly enhanced stainless steel and aluminum capabilities are delivered with the addition of F₅ HDi processes and patent pending Vented Water Injection (VWI).

OptiMix™ console

All the capabilities of the Core and VWI consoles plus discrete 3-gas mixing – Ar, H_2 , and N_2 – for the world's most flexible, premium stainless steel and aluminum cutting capability.







Optimized productivity and reduced operating costs

Building on Hypertherm's industry-leading productivity technologies, XPR™ delivers faster cut speeds, higher quality cuts that reduce or eliminate secondary operations and increased consumable life with quicker set up time. These combine to further slash plasma system operating costs.

Technology benefits

- A valve in the torch receptacle delivers more rapid and precise control over gas flows for significantly longer oxygen process life and a greatly accelerated ramp down process. This elimination of ramp down errors in most applications enables a consumable life span nearly 3 times longer than other systems.
- New Cool nozzle[™] flow technology contributes significant consumable life increases with greater ISO range 3 results than ever before.
- Increased power and argon-assist piercing delivers much thicker piercing capacity on mild steel for further productivity benefits.
- High quality argon marking using the same cutting consumables allows for a rapid and efficient changeover.

		XP	R170	XPR300		
Maximum output power		35.	7 kW	66.5 kW		
100% duty arc voltage	2	10 V	222 V			
Cut chart thickness		mm	inches	mm	inches	
Pierce capacity	Mild steel (argon-assist)	40	1-9/16	50	2	
	Mild steel (standard O_2)	35	1-3/8	45	1-3/4	
	Stainless steel	22	7/8	38	1-1/2	
	Aluminum	25	1	38	1-1/2	
Severance capacity	Mild steel	60	2-3/8	80	3-1/8	
	Stainless steel	38	1-1/2	75	3	
	Aluminum	38	1-1/2	50	2	
Cut angle	ISO 9013 range	2	2–4	2-4		



Competitor A

(280 A)

(300 A)



XPR

(300 A)

Number of 20-second starts



HPRXD

(260 A)



Argon marking



Engineered system optimization

XPR[™] is engineered to deliver the highest quality cuts and optimal system performance automatically. Advanced power supply technology delivers highly responsive, rapid system feedback, and automatically intervenes to eliminate events that negatively impact system efficiency and consumable life.

Arc response technology™

Automatic torch protection

The chopper module senses the onset of catastrophic electrode blowout failure and shuts down the system, protecting the torch from potential damage and enabling improved consumable utilization.

- Prevents torch failure
- Reduces operating cost

Improved operating and troubleshooting information

Sensors in the power supply deliver refined diagnostic codes and significantly enhanced system monitoring information. This reduces troubleshooting time and provides proactive system maintenance data for improved system optimization.

XPR's cutting-edge power supply features advanced chopper circuitry that instantaneously senses and responds to changes in arc voltage and current settings. This sophisticated Arc response technology™ delivers important benefits that reduce operating costs and increase productivity.

Automatic ramp-down error protection

The chopper module senses when a cut is about to end in an uncontrolled manner – without proper ramp down of current and gas flow. It automatically initiates a rapid ramp-down sequence protecting the electrode, dramatically extending consumable life – over 3 times that of systems that don't have this feature.

- Protects electrode
- Improves realized consumable life
- Reduces operating cost







Ease of use

XPR[™] sets the new standard for achieving advanced system performance easily. From system set up and installation to connectivity and process optimization, XPR's intuitive operation and automatic system monitoring redefine easy plasma cutting.

- Fewer consoles and connections reduce components and complexity.
- Torch lead includes the EasyConnect[™] tool-less connection to the TorchConnect[™] console, reducing set up time and simplifying replacement.



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- All consoles feature advanced autogas capability enabling all cutting processes to be selected and driven directly from the CNC.
- Patent pending QuickLock[™] electrode delivers easy ¼ turn tightening, reducing job setup time.
- Hypertherm's easiest and fastest torch disconnect design enables a rapid, one handed torch change.







- Built in WiFi connects operating and monitoring abilities to the mobile device dashboard.
- Easy to navigate and read.
- Allows the selection of cutting processes and the monitoring of multiple systems from most mobile devices and laptops.



Reliability

XPR's engineering development is the culmination of tens of thousands of hours in testing, data analysis, and system tuning. Our development optimizes your uptime ensuring reliable machine performance even under highly stressful field conditions. The XPR[™] is Hypertherm's smartest mechanized plasma system to date. On-board sensors continually monitor current, pressure, temperature, flow and compare to specifications during your operation to ensure optimum performance.

Specifications

General	XPR170	XPR300			
Maximum open-circuit voltage	360 VDC	360 VDC			
Maximum output current	170 A	300 A			
Maximum output power	35.7 kW	66.5 kW			
Output voltage	50-210 VDC	50–222 VDC			
100% duty arc voltage	210 V	222 V			
Duty cycle rating	100% at 35.7 kW, 40° C 104° F)	100% at 66.5 kW, 40° C (104° F)			
Operational ambient temperature range	-10° C-40° C (14° F-104° F)	-10° C-40° C (14° F-104° F)			
Power factor	0.98 @ 35.7 kW	0.98 @ 66.5 kW			
Cooling	Forced air (Class F)	Forced air (Class F)			
Insulation	Class H	Class H			
EMC emissions classification (CE models only)	Class A	Class A			
Lift points	Top lift eye weight rating 454 kg (1,000 lb.)	Top lift eye weight rating 680 kg (1,500 lb.)			
	Bottom lift truck slots	Bottom lift truck slots			

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> Plasma Systems Inc. 11601 N. Houston Rosslyn Rd. Houston, Tx 77086 sales@plasmasystemsinc.com Phone: 832-243-9900 Fax: 832-243-9901

Console	Cutting gases	Current (A)	Thickness (mm)	Approximate cutting speed (mm/min)	Thickness (in.)	Approximate cutting speed (ipm)
			Mild ste	el		
	O2 plasma	30	0.5	5348	0.018	215
	O ₂ shield		3	1153	0.135	40
			5	726	3/16	30
	O ₂ plasma	50	3	3820	0.105	155
	Air shield		5	2322	3/16	95
			8	1369	5/16	55
	O ₂ plasma	80	3	5582	0.105	225
	Air shield		6	3048	1/4	110
			12	1405	1/2	55
Core,	O ₂ plasma	130	3	6502	0.135	240
VWI, and	Air shield		10	2680	3/8	110
Optimix			38	256	1-1/2	10
	O ₂ plasma	170	6	5080	1/4	200
	Air shield		12	3061	1/2	115
			25	1175	1	45
			60	152	2-3/8	6
	O ₂ plasma	300	12	3940	1/2	155
	Air shield		25	1950	1	75
	N ₂ shield	300	50	560	2	21
			80	165	3	7
			Stainless s	teel		
Core	N₂ nlasma	40	0.8	6100	0.036	240
VWI and	N ₂ shield	10	3	2683	0.000	120
OntiMix	NZ SITICIU		6	918	1/4	32
optimit	F5 nlasma	80	3	4248	0 135	140
VWI and	N ₂ shield		6	1916	1/4	70
OptiMix			12	864	1/2	34
	Ho-Δr-No		12	001	172	01
	plasma	1/0	10	1975	3/8	80
	N ₂ shield		12	1735	1/2	65
			38	256	1-1/2	10
OptiMix	H ₂ -Ar-N ₂	000	10	0000	1/0	00
	plasma	300	12	2038	1/2	80
	N ₂ shield		25	1040	1	40
			50	387	2	15
			75	162	3	6
104/L a.r.d	N ₂ plasma	300	12	2159	1/2	85
OptiMix	H ₂ O shield		25	1302	1	50
Opulwix			50	403	2	15
			Aluminu	m		
Core.	Air plasma	40	1.5	4799	0.036	240
VWI, and	Air shield		3	2596	1/8	85
OptiMix			6	911	1/4	32
	N ₂ plasma	80	3	3820	1/8	140
	H ₂ O shield		6	2203	1/4	80
	_		10	956	1/2	28
1040 .	N ₂ plasma	130	6	2413	1/4	95
VVVI and	H ₂ O shield		10	1702	3/8	70
opulvix			20	870	3/4	35
	N ₂ plasma	300	12	2286	1/2	90
	H ₂ O shield		25	1302	1	50
			50	524	2	20
	H ₂ -Ar-N ₂	200	10	2010	1/0	150
OntiMise	plasma	300	12	30 IU	1/2	100
opulvitx	N ₂ shield		25	2056	1	80
			50	391	2	15

This does not represent a complete list of processes or thicknesses that are available





Proven Systems + Outstanding Service

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