

Industr. Innovation and Infrastructure			
SDG 9			
closed-loop supply chain	femtosecond laser micromachining	environmental life cycle assessment	product innovations
arc additive manufacturing	agile manufacturing	access to internet	transport infrastructure
micromachining process	laser powder bed fusion	iiot	electric discharge machining (edm)
laser micromachining	iiot infrastructure	urban infrastructure	smart manufacturing system
micro-fabrication	fused deposition modelling (fdm)	mixed-model assembly line	green infrastructures
bulk micromachining	aisi10mg	iso 2631	electrochemical micromachining
fused filament fabrication (fff)	microfabrication techniques	the digital divide	national innovation
broadband wireless access	road infrastructure	remanufacturing system	highway infrastructure
laser filament fabrication	iiot4	virtual manufacturing	nanofabrication
metal additive manufacturing	laser powder bed	additive manufacture	sustainable machining
additive manufacturing (am) process	green infrastructure (g)	infrastructure investments	internet penetration
micro-machining	virtual prototyping	the reverse logistics	industrial automation
the industrial internet	micromachining technique	green supply chain management (gscm)	sport infrastructure
industrial internet of things (iiot)	access to the internet	transport infrastructures	wire and arc
filament fabrication	nano-fabrication	infrastructure resilience	electro-discharge machining
web accessibility	public transport service	process innovation	smart infrastructure
life cycle assessment method	composite manufacturing	public transportation systems	advanced process control
surface micromachining	impact categories	fourth industrial revolution	firm process
smart factory	urban green infrastructure	nanoelectronics	life cycle impact
cloud manufacturing	digital manufacturing	five-axis machine	critical infrastructure system
sustainable manufacturing	supply chain sustainability	innovation policies	infrastructure projects
fused filament	public transport system	remanufacturing process	microfabrication.
microfabrication process	broadband access network	laser clad	industry 5.0
slm process	simapro	computer numerical control	laser melting process
remanufactured product	industrial wastewater treatment	industrial control systems (ics)	iiot.
additive manufacturing processes	computer numerical control (cnc)	metal laser sintering	direct metal laser sintering (dmls)
additive manufacturing	university-industry	technological capabilities	aisi10mg alloy
waam	sustainability reporting	and additive manufacturing	iso 9001
eco-innovation	remanufacturing	reform fabrication	tool electrode
railway infrastructure	edm process	nanofabrication.	urban infrastructures
wire arc additive manufacturing	life cycle assessment methodology	public transport systems	implementation of industry 4.0
remanufactured products	micro fabrication	fourth industrial	industrial automation systems
industry 4.0 technologies	selective laser melting (slm)	iso 14001	remanufacturer
smart factor	regional innovation system	public transport services	broadband access networks
life-cycle assessment	infrastructure assets	cnc machining	laser sintering
smart factories	rapid manufacturing	internet service provider (isp)	pulse on time
wire electrical discharge machining	precision manufacturing	direct metal laser sintering	advanced manufacturing technologies
additive manufacturing technology	machining technology	cnc machine tool	micromachining processes
laser powder bed fusion (l-pbf)	innovation strategy	critical infrastructure protection	collaborative robotics
reverse logistics	fast prototyping	nanomachining	powder bed fusion (pbf)
laser additive manufacturing	industry 4.0 (ii4.0)	closed-loop supply chain (clsc)	lean manufacturing
industrial symbiosis	design for additive manufacturing	water infrastructure	lca life cycle assessment
industrial ecology	broadband access	eco-industrial park	sustainable supply chains
life cycle assessments	build direction	university-industry collaboration	wire and arc additive manufacturing
infrastructure asset	cleaner product	micromachining techniques	4.0 industry
4.0 technologies	additive manufacturing method	ecoverent	impact category
internet service providers (isps)	design for additive	transportation infrastructure	life cycle impact assessment
electrical discharge machining (edm)	clean production	industry 4.0 concept	sustainable supply chain management (sscm)
ultra-precision machining	public infrastructure	electrical discharge machining	technological innovation system
reverse logistic	infrastructure system	innovation policy	open innovation (oi)
infrastructure planning	industrial internet	selective laser sintering	cnc machines
internet service providers	wire arc additive manufacturing (waam)	nanoelectronics	closed-loop supply chain network
innovation knowledge	wire electrical discharge machining (wedm)	road infrastructures	rapid prototyping (rp)
additive manufacturing process	co-innovation	cnc machine tools	acidification potential
sustainable supply chain management	powder bed fusion process	iso 934	iso 2631-1
micro machining	public transport network	regional innovation systems	cnc machine
additive manufacturing	industrial control systems	efficient manufacturing	directed energy deposition
l-pbf	surface micromachining process	intelligent manufacturing system	university?industry
internet infrastructure	selective laser sintering (sls)	product and process innovation	lca study
smart manufacturing	additive manufacturing techniques	layer manufacturing	laser sinter
life-cycle assessment (lca)	laser powder bed fusion (l-pbf)	five-axis machine tool	life cycle inventory
sustainable supply chain	build orientation	life cycle inventory	nanofabrication techniques
infrastructure management	eco-industrial	collaborative robotic	fast tool servo
public transportation system	web access	selective laser sinter	selective laser melting
eco-iii	electric discharge machining	selective laser melted	elective laser melting
wire electrical discharge	innovation strategies	electron beam melting	industrial robotics
fused deposition modeling (fdm)	cradle-to-gate	powder bed fusion additive manufacturing	experimental physics and industrial control system
micro-edm	semufacturing	laser cladding technology	closed loop supply
micromachining technology	mixed-model assembly	environmental life cycle	eutrophication potential
microfabrication technique	infrastructure plan	remanufacture	closed loop supply chain
additive manufacturing technique	sustainable infrastructure	process innovations	electrical discharge machining process
fused deposition modelling	triple bottom line	industrial automation system	life cycle environmental impact
green supply chain	3d printing	structure management	laser micro-machining
laser additive	lean production	ii4.0	l-pbf process
additive manufacturing technologies	layered manufacturing	corporate sustainability	eco-innovations
intelligent manufacturing	iso 14040	electron beam melting (ebm)	sustainable supply
cleaner production	deposition modelling	national innovation system	additive manufacturing (am)
industry 4.0	disruptive innovation	telecommunication infrastructure	structure protection
l-pbf	the fourth industrial revolution	electro discharge machining	additively manufactured
laser cladding process	industrial robotic	fused deposition model	abiotic depletion
industrial internet of things	wedm	five-axis machining	life cycle assessment (lca)
iso 28262	selective laser melting process	beam melting	infrastructure project
industrial internet of thing	silicon micromachining	infrastructure investment	cumulative energy demand
remanufactured	powder-bed	lca method	innovation system
digital inclusion	structure planning	open innovation	digital divide
comparative life cycle assessment	laser cladding	closed-loop supply chains	critical infrastructure systems
collaborative robot	the triple bottom line	technological capability	laser powder bed fusion process
nanomanufacturing	innovation systems	digital factory	solid freeform fabrication
green manufacturing	industrial control system	microfabrication processes	digital inequality
green supply chain management	fused deposition modelling	deposition modeling	rapid prototyping process
internet service provider	additive manufactured	computer numerical control (cnc) machine	wireless internet access
green infrastructure	rapid tooling	fused deposition	cnc milling
industry innovation	infrastructure protection	global manufacturing	lca methodology
collaborative robots	environmental impact categories	transportation infrastructures	product innovation
green supply	powder bed fusion	machining technologies	powder-bed fusion
industrial iot	microfabrication technology	building direction	machining technique
infrastructure systems	aisi10	reverse logistics network	manufacturing technologies

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adg9: industry	5-axis machining	3d printing process	consequential life cycle assessment
hybrid manufacturing	life cycle environmental impacts	wire and arc additive manufacturing (waam)	freshwater ecotoxicity
micro fabric	laser-based powder bed fusion	iso 50001	manufacturing innovation
nano fabrication	neilient infrastructure	laser powder bed fusion additive manufacturing	industrial internet of things (iiot)
iso 10993	additive layer manufacturing	micro-fabric	silicon bulk micromachining
pulse of time	distributed control system	oscm practices	ict infrastructures
additive manufacturing methods	electrode wear	iso 14000	domestic technology
disruptive innovations	cladding technology	industry wastewater	acidification potential (ap)
cobots	manufacture technology	product and process innovations	pb-f
eco-design	model assembly	laser powder-bed fusion	solid free
manufacturing paradigm	public transport networks	selective electron beam melting	open innovation process
laser claddd	rapid prototyping technology	industrial robot arm	bulk-micromachining
wastewater infrastructure	rapid prototyping technique	manufacturing sustainability	stereolithography process
intelligent manufacturing systems	efficient machining	computer numerical control machine	isi
sustainable pavement	rapid prototyping system	binder jetting	infrastructure policy
social life cycle assessment	broadband wireless access system	life cycle inventory data	quality infrastructure
electro discharge	rapid-prototyping	marine infrastructure	manufacturing tool
material extrusion	national innovation systems	manufacturing design	rapid prototyping techniques
robotic cell	surface micromachining technology	environmental burdens	additive layer
clean product	micro edm	mobile internet access	cyber-physical production
iso 9241	electrochemical discharge machining	flexible manufacturing system (fms)	3d printers
industry 4.0 era	robotic process automation	4.0 era	fdm parts
eco-industrial parks	automated manufacturing system	municipal infrastructure	hybrid additive manufacturing
stereolithography	laser cladding layer	factory automation	additive fabrication
model of innovation	broadband wireless access (bwa)	infrastructure quality	prototyping method
subtractive manufacturing	tool servo	wire-arc additive manufacturing	material extrusion additive manufacturing
broadband internet access	lean production system	port infrastructure	conventional machining
iso-1	manufacturing cloud	electro-discharge machining (edm)	community innovation survey
sustainable supplier	lca software	industrial robots	silicon surface micromachining
industrial wastewater treatment plant	composite manufacturing process	edm parameters	iso 7730
wedm process	micromanufacturing	robotic process	cnc system
sustainability report	virtual factory	wire arc	nano-manufacturing
stereolithography (sla)	extrusion additive manufacturing	fossil depletion	industrial energy consumption
iso 9000	large infrastructure projects	experimental physics and industrial control system (epics)	wire edm
civil infrastructure system	nc milling	micro/manufacturing	remanufacturing cost
advanced manufacturing	3d printed parts	5-axis	industry automation
sc99	waam process	micro manufacturing	142
triple bottom line (tbl)	green supply chains	laser melting	life cycle assessment studies
metal additive	investments in infrastructure	tool wear rate	manufacturing service
cnc milling machine	global reporting initiative	technological innovation systems	nano manufacturing
step-nc	industrial innovation	lca analysis	prototyping techniques
composites manufacturing	industrial control system (ics)	toolpath	industry i&d
conventional manufacturing	access to computers	global reporting	sustainable product design
new manufacturing	gscm	prototyping process	impact assessment method
machining techniques	reverse logistics system	public infrastructures	corporate sustainability report
microfabrication technologies	life cycle impact assessment (lca)	design for additive manufacturing (dfam)	innovation practices
hatch spacing	prototyping technique	edm machining	reverse logistics supply chain
laser microfabrication	directed energy deposition (ded)	cradle to gate	iso 10993-5
access to ict	lean manufacturing (lm)	micromanufacturing	electrochemical discharge machining (ecdm)
regional innovation	laser cladding technique	distributed control system (dcs)	build orientations
port infrastructures	automated manufacturing systems	sustainable supplier selection	tool path generation
iso 17025	micro electrical discharge machining	industrial iot (iiot)	industry 4.0 implementation
micro-manufacturing	iso 10303	iiot industry	servo voltage
investment in infrastructure	pulse-on time	sustainability reports	computer aided process planning
large infrastructure project	industrial collaboration	industrial manipulator	internet accessibility
life cycle inventory (lci)	nc machine tools	innovation product	accessibility web
manufacturing energy	nc milling machine	green innovation	additively manufactured metal
ultraprecision machining	cloud manufacturing (cmfa)	computer numerical control (cnc) machine tool	business angels
traditional manufacturing	nc machines	iso 31000	broadband wireless access systems
mixed-model assembly lines	laser sintered	melt pool	manufacturing sme
discharge machining	stereolithography (sl)	business angel	laser-based additive manufacturing
innovation survey	fdm 3d printing	sinking edm	reverse supply chain
distributed control systems	nanofabrication	nc machine	energy-intensive industries
iso 15189	industrial robot manipulator	manufacturing mode	electrode wear rate
civil infrastructure systems	direct manufacturing	global reporting initiative (gri)	computer-aided process planning
prototyping technology	nc machine tool	manufacturing automation	transport infrastructure projects
nanofabric	l-pbf process	laser additive manufacturing (lam)	access to infrastructure
powder bed	smart industry	recast layer	human toxicity potential
infrastructure asset management	lca (life cycle assessment)	advanced manufacturing technology	manufacturing technology
nanofab	infill density	cloud manufacturing service	scm practices
iso 4049	binder jet	robotic process automation (rpa)	rapid prototyping tool
telecommunications infrastructure	industrial energy	iso 27001	eco-indicator
router angle	broadband wireless access network	remanufacturing systems	traditional machining
structure project	returned products	extrusion-based additive manufacturing	infill pattern
tool wear rate (twr)	wireless broadband access	nano-machining	iso 9001:2015
industrial energy efficiency	life cycle impacts	direct energy deposition	mixed model assembly
tool management	innovation and infrastructure	advanced process control (apc)	scmview database
innovative manufacturing	returned product	cradle-to-grave	die-sinking
water infrastructures	digital divides	precision machining	tool paths
five-axis machine tools	cisc	flexible robotic	iso 9126
microfabrication	advanced manufacturing process	life-cycle assessments	cyber-physical production system
profabrication	terrestrial acidification	digital mechatronics	cradle-to-gate life cycle assessment
internet access	entrepreneurial finance	infrastructure sustainability	lca tool
smart manufacturing systems	five-axis	lca model	railway infrastructures
additive manufacturing system	bridging the digital divide	global infrastructure	environmental hotspot
wire electric discharge machining	electro-discharge	simapro software	innovation performance
arc additive manufacture	robotic machining	fourth industrial revolution (4ir)	industry 4.0 technology
ecodesign	cladding coating	five-axis cnc	manufacturing concept
rapid prototyping method	industrial symbiosis (is)	dmis	open innovation practices
urban public transportation	laser metal deposition	innovation efficiency	micro-stereolithography
laser cladding coating	micro-fabrication technique	industrial internet-of-things	innovation environment
cladding process	manufacturing and remanufacturing	iso 25178	robotic cells
social life cycle	free internet	human toxicity	urban water infrastructure
reverse logistics (rl)	terrestrial ecotoxicity	industry 4.0 applications	freshwater eutrophication
industrial process control	iso 3382	water ecotoxicity	edm machine
wire electric discharge	transport infrastructure project	electron beam additive manufacturing	flexible manufacturing systems
nc machining	micro-electrical discharge machining	comparative lca	technologies of industry 4.0

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manufacturing model	sdg9: industry, innovation, and infrastructure	cumulative energy demand (ced)	sustainable performance
manufacturing smes	printing parameters	life cycle greenhouse gas	cnc turning
lca framework	environmental hotspots	life cycle assessment	manufacturing waste
life cycle perspective	3d printing technologies	the industrial structure	wire electric discharge machining (wedm)
comparative life cycle assessment (lca)	computer aided manufacturing	laser-powder bed fusion	industry 4.0 revolution
iso 9001:2000	printing parameter	lean production systems	machining system
impact 2002	robotic automation	environmental innovation	industry employment
lean manufacturing tools	selective laser melting technology	high-tech industries	micro/nano fabrication
e-manufacturing	iso 14044	machining characteristics	quality of infrastructure
iso 6579	process and product innovation	r&d intensity	sustainable innovation
smart production	industrial robotic arm	rapid prototypes	eco-innovative
university-industry relation	green product innovation	innovation capability	interdependent infrastructure
fill density	additive manufacturing (3d printing)	polyjet	ultrasonic additive manufacturing
laser metal deposition (lmd)	chinese manufacturing	vat photopolymerization	ultra-precision
sustainable industry	deposition model	sustainable industrial development	slm process parameters
eutrophication potential (ep)	industrie 4.0	abiotic depletion potential	edm drilling
corporate sustainability performance	attributional life cycle assessment	public transport infrastructure	industrial wastewater
lca data	life cycle sustainability	sustainable manufacturing system	value stream map
product innovation performance	energy efficiency in industry	digital man	end-of-life product
manufacturing resources	cyber-physical production systems	industrial wastewater treatment plants	manufacturing services
flexible fabrication	3d microfabrication	ultra-precision turning	manufacturing machine
internet access service	primedm	bulk micromachining technology	new product innovation
industrial control systems (ics)	fused deposition modeling process	cnc machining center	environmental profile
manufacturing/remufacturing	remanufacturing supply chain	industrial waste heat	
innovation activities	open innovation model	life cycle costing (lcc)	
agricultural innovation system	sustainable road	closed-loop supply chain network design	
life cycle inventories	major infrastructure projects	electron beam powder bed fusion	
web access log	structure systems	characterization factors	
university-industry relations	iso 9001 standard	manufacturing platform	
electro discharge machining (edm)	fast tool servo (fts)	pulse-off time	
cleaner production (cp)	advanced manufacturing processes	innovation ecosystem	
green infrastructure planning	mixed model assembly line	innovation index	
cloud manufacturing environment	eco-efficiency	inclusive innovation	
iso 9000 certification	laser melting technology	lca practitioners	
innovation capabilities	solid freeform fabrication (sff)	iso 9000 standard	
urban public transport	circular economy (ce)	machining feature	
net applications	iso 14001 certification	cnc controller	
distributed manufacturing	silicon microfabrication	fdm 3d printer	
laser cladding (lc)	port infrastructure investment	manufacturing enterprises	
machining method	university-industry link	global innovation	
broadband wireless access networks	innovation practice	industrial manipulators	
wire-arc	remanufacturing industry	automated manufacturing	
flexible manufacturing system	virtual prototyping technology	types of innovation	
5-axis cnc	fourth industrial revolution (industry 4.0)	surface-micromachining	
manufacturing tools	wire-edm	powder feeding	
iso 9000 series	life cycle assessments (lca)	recycling and remanufacturing	
computer numerical control (cnc) machining	eco-indicator 99	green supply chain management practice	
pulse on time (ton)	blue-green infrastructure	open innovation approach	
sustainability performance	flexible manufacturing	industrial waste heat recovery	
ii.o technologies	rapid prototyping technologies	reverse logistics network design	
micro-edm process	environmental product declaration	4th industrial revolution	
opc ua	edm performance	metal 3d printing	
industry 4.0	global innovation index	tool path planning	
life cycle thinking	machining efficiency	additive technologies	
life cycle assessment study	equity crowdfunding	rotary axes	
material removal rate (mrr)	s-lca	deposition mode	
wear ratio	prototyping system	machining robot	
industry 4	impact 2002+	remanufacturing operations	
community innovation	rapid prototyping	overcut	
metal 3d print	5-axis machine	laser-cladding	
university?industry collaboration	industrial ecosystem	prototyping	
industrial robot	hybrid life cycle assessment	life cycle sustainability assessment	
surface roughness (sr)	hybrid additive	symbolics network	
tool path	structure plan	value stream mapping	
industrial parks	micro- and nanofabrication	lean manufacturing system	
advanced machining	internet policy	hybrid machining	
laser beam melting	machining characteristic	regional innovation policy	