VALTOR Washer Selection Guide

Plain, large-series, locking and sealing washer selection for fastener applications

Buyer reference only. Washer selection affects bearing pressure, surface protection, load distribution, locking behaviour and sealing. A washer should be selected together with the bolt/screw/nut strength, joint material, hole size, coating and service environment.

1. Common Washer Types & Selection Logic

Washer Type	Primary Function	Best-Fit Use	Current / Main Reference	Common DIN / Trade Reference	Main Advantage	Main Limitation	Buyer Selection Cue
Plain washer — normal series	Distribute bearing load and protect the joint surface around the hole	General bolts, screws and nuts in machinery, construction and industrial assemblies	ISO 7089:2000 (Product grade A); ISO 7091:2000 for Product grade C	DIN 125 / DIN 125 A remains common buyer terminology	Simple, widely available, predictable bearing area	Does not provide reliable locking by itself	Use as the default load-distribution washer when a larger bearing diameter is not required.
Plain washer — chamfered normal series	Load distribution with a chamfered edge / geometry suited to the applicable product standard	Higher-grade bolted joints or applications where chamfer geometry is specified	ISO 7090:2000	Often purchased as DIN 125-type / chamfered washer depending market terminology	Controlled geometry for standardized bolted joints	Not interchangeable with every plain washer where thickness, chamfer or hardness is critical	Specify ISO 7090 if the chamfered washer geometry is part of the joint design.
Plain washer — large series	Increase bearing area and reduce local surface pressure	Thin sheet, softer substrates, oversized/elongated holes, larger bearing footprint	ISO 7093-1:2000 Product grade A; ISO 7093-2:2000 Product grade C	DIN 9021 remains a very common purchasing reference	Much larger outside diameter than normal-series washers	Larger OD can interfere with edges, recesses or nearby components	Choose when surface pressure or hole coverage is more important than compact size.
Plain washer — small series	Provide load distribution where radial space is limited	Compact assemblies, recessed areas and limited outer-diameter clearance	ISO 7092:2000	Trade use varies; check drawing rather than relying only on DIN shorthand	Smaller outside diameter saves radial space	Higher local bearing pressure than normal/large-series washers	Use only when surrounding geometry limits washer OD.
Spring lock washer	Traditional spring / edge action intended to resist loosening	Legacy machinery and assemblies specifically designed around spring washers	Legacy product family; verify customer drawing / DIN requirement	DIN 127 A / B is still widely requested in trade	Simple and familiar legacy locking element	Do not treat as a universal vibration-locking solution for critical joints; locking effectiveness depends heavily on joint conditions	Use when the customer drawing or legacy specification explicitly calls for it; do not substitute automatically for engineered locking systems.
Toothed / serrated lock washer	Teeth bite into mating surfaces to increase resistance to rotation and can improve electrical contact through coatings	Electrical bonding, light-duty locking and assemblies where teeth can embed into the surfaces	Often controlled by legacy DIN / customer drawing; verify exact internal/external-tooth form	DIN 6797 / DIN 6798 families are common trade references	Positive tooth contact and compact geometry	Can damage finishes; effectiveness depends on surface hardness and whether teeth can penetrate the coating	Specify internal/external teeth, material, hardness and finish — not just 'star washer'.
Bonded sealing washer — metal + EPDM	Distribute clamp load and provide an elastomeric weather seal around the fastener penetration	Roofing, cladding, exterior self-drilling and self-tapping screw applications	Product / project-specific sealing system; commonly paired with roofing/self-drilling screw standards	Often called bonded washer / EPDM washer / sealing washer	Combines metal load spreader with compliant weather seal	Seal performance depends on washer diameter, EPDM grade, compression and installation angle	Specify metal backing material + EPDM + OD + screw size + exposure + required sealing performance.
PVC washer	Provide a compliant insulating / light sealing interface under the screw head	Specific OEM, sheet-metal and light sealing/insulation applications	Manufacturer / project specification	PVC washer / PVC sealing or insulating washer	Low-cost compliant interface and electrical/galvanic separation in suitable applications	Not automatically equivalent to EPDM for long-term UV/weather/roofing exposure	Confirm temperature, UV exposure, chemical environment and sealing function before substitution.

2. Quick Application Selection Matrix

Application	Recommended Washer Direction	Why	Material Direction	Critical Check	Avoid This Shortcut	Typical Reference	RFQ Detail
General bolted machinery joint	Normal-series plain washer	Spreads bearing load and protects the seating surface	Match washer material/hardness to bolt/nut strength and corrosion environment	Washer hardness + hole size + surface finish	Using a soft washer under a high-strength bolt without checking deformation	ISO 7089 / ISO 898-3 / ISO 3506-7	Bolt class/material + washer size + washer property class/material + finish
Thin sheet or soft material	Large-series plain washer	Larger OD reduces local bearing pressure and improves hole coverage	Steel, stainless or project-specific material	Edge distance and available radial clearance	Using a normal washer where the sheet is already deforming around the hole	ISO 7093-1 / DIN 9021 buyer terminology	Sheet material/thickness + hole size + required OD + washer material
High-strength carbon/alloy steel joint	Flat washer with specified property class	Washer hardness/property class must support the bolt/nut joint without excessive indentation	Carbon/alloy steel washer to the required ISO 898-3 class	Bolt class, washer class, surface treatment and temperature	Selecting washer only by dimensions while ignoring mechanical property class	ISO 898-3:2018 + Amd 1:2020	Bolt property class + washer property class + dimensions + coating
Stainless bolted joint	Stainless flat washer with specified grade/property class	Material compatibility and mechanical support should be considered together	Austenitic / ferritic / duplex stainless as required	Fastener grade + environment + temperature + washer grade/property class	Calling every stainless washer simply 'A2 washer' without checking the required mechanical class	ISO 3506-7:2024	Bolt/nut stainless grade + washer grade/property class + finish/certificate
Roofing / cladding	Bonded metal + EPDM sealing washer	Provides both load distribution and weather sealing	Stainless or coated metal backing; EPDM selected for exposure	Washer compression, OD, roof profile, installation angle	Using a plain washer where a weather seal is required	Project / roofing screw system	Screw + washer OD/material + EPDM + exposure + sealing requirement
Electrical bonding / grounding	Toothed / serrated washer where permitted	Teeth can penetrate coatings and improve metal-to-metal contact	Spring steel / stainless depending design	Surface coating, contact resistance and substrate hardness	Assuming serrations always penetrate thick or hard coatings	Customer drawing / electrical project requirement	Internal/external tooth + material + finish + bonding requirement
Legacy anti-loosening assembly	Spring lock washer only when specified by the drawing/project	Maintains compatibility with the legacy design	Spring steel / stainless as required	Joint preload, vibration level and actual locking requirement	Treating DIN 127 as a universal solution for vibration-critical joints	DIN 127 buyer reference	Washer form + material + size + locking requirement / project standard

3. Washer Material & Mechanical Compatibility

Joint / Fastener Type	Washer Material Direction	Mechanical Standard	Why	Temperature Boundary	Corrosion Note	Buyer Check

Carbon/alloy-steel bolt + nut	Carbon/alloy-steel flat washer with suitable property class	ISO 898-3:2018 + Amd 1:2020	Standardizes washer mechanical/physical properties for use with specified bolt/nut classes	Standard values are evaluated at ambient temperature; service outside normal ranges needs engineering review	Corrosion resistance is not specified by ISO 898-3; coating must be specified separately	Bolt class + washer class + coating + service temperature
Stainless bolt + nut	Corrosion-resistant stainless flat washer with compatible grade/property class	ISO 3506-7:2024	Provides a standardized washer grade/property-class system linked to ISO 3506 fasteners	Published guidance notes normal application ranges but allows service outside them only with user assessment	Select alloy by actual corrosion environment — A2/A4/D6/D8 are not interchangeable shortcuts	Fastener grade + washer grade/property class + environment + certificate
Roofing screw + bonded washer	Metal backing + EPDM seal system matched to roof/exposure	System / project specification	Mechanical load distribution and sealing are both functional requirements	EPDM compound and metal backing temperature limits are product-specific	Metal backing and screw material should be selected for galvanic/corrosion compatibility	Screw material + washer backing + EPDM + UV/weather exposure

4. DIN & ISO Purchasing Note

DIN numbers remain common buyer language. DIN 125 is commonly associated with normal-series plain washers and DIN 9021 with large-OD washers, while current ISO references include ISO 7089/7090/7091 and ISO 7093-1/-2. The ISO 7089 and ISO 7093 series are currently still published, but revision projects are underway in 2026. For public quotations, keep the requested DIN number visible while confirming the actual dimensions, product grade, washer hardness/property class and material.

5. Current Standards & Technical References

Reference	Status / Scope	Used For	Source URL
ISO 887:2000	Current; confirmed 2026 — general plan for plain washers used with metric bolts, screws and nuts	General washer dimensional plan and selection framework	https://committee.iso.org/standard/5277.html?browse=tc
ISO 7089:2000	Current; confirmed 2021; revision project underway in 2026 — normal-series plain washers, product grade A	Normal-series plain washers	https://www.iso.org/standard/13666.html
ISO 7090:2000	Current; confirmed 2021; revision project underway in 2026 — chamfered normal-series washers, product grade A	Chamfered plain washers	https://www.iso.org/standard/13669.html
ISO 7093-1:2000	Current; confirmed 2021; revision project underway in 2026 — large-series plain washers, product grade A	Large-series / DIN 9021-type washer direction	https://committee.iso.org/standard/13677.html?browse=tc
ISO 7093-2:2000	Current; confirmed 2022; revision project underway in 2026 — large-series plain washers, product grade C	Large-series product grade C	https://committee.iso.org/standard/30046.html?browse=tc
ISO 898-3:2018 + Amd 1:2020	Current; confirmed 2023 — flat washers with specified property classes in carbon/alloy steel	Mechanical properties / property classes of steel flat washers	https://www.iso.org/standard/63232.html
ISO 3506-7:2024	Current — stainless flat washers with specified grades and property classes	Mechanical/physical properties and grade/property-class designation for stainless flat washers	https://www.iso.org/standard/82018.html
ISO 10644:2009	Current; confirmed 2024 — captive screw and plain washer assemblies, washer hardness 200 HV / 300 HV	SEMS / captive plain washer assemblies	https://www.iso.org/standard/44116.html
DIN 125 / DIN 9021 buyer references	Legacy/common trade terminology; verify current ISO dimensional/product requirements	Buyer cross-reference language	https://www.fasteners.eu/en/standards/ISO/7089/ ; https://www.fasteners.eu/standards/DIN/9021/

Recommended RFQ format: WASHER TYPE / STANDARD + NOMINAL SIZE + ID / OD / THICKNESS IF CRITICAL + PRODUCT GRADE + MATERIAL / PROPERTY CLASS / HARDNESS + FINISH + LOCKING OR SEALING FUNCTION + SERVICE ENVIRONMENT + CERTIFICATE REQUIREMENT.