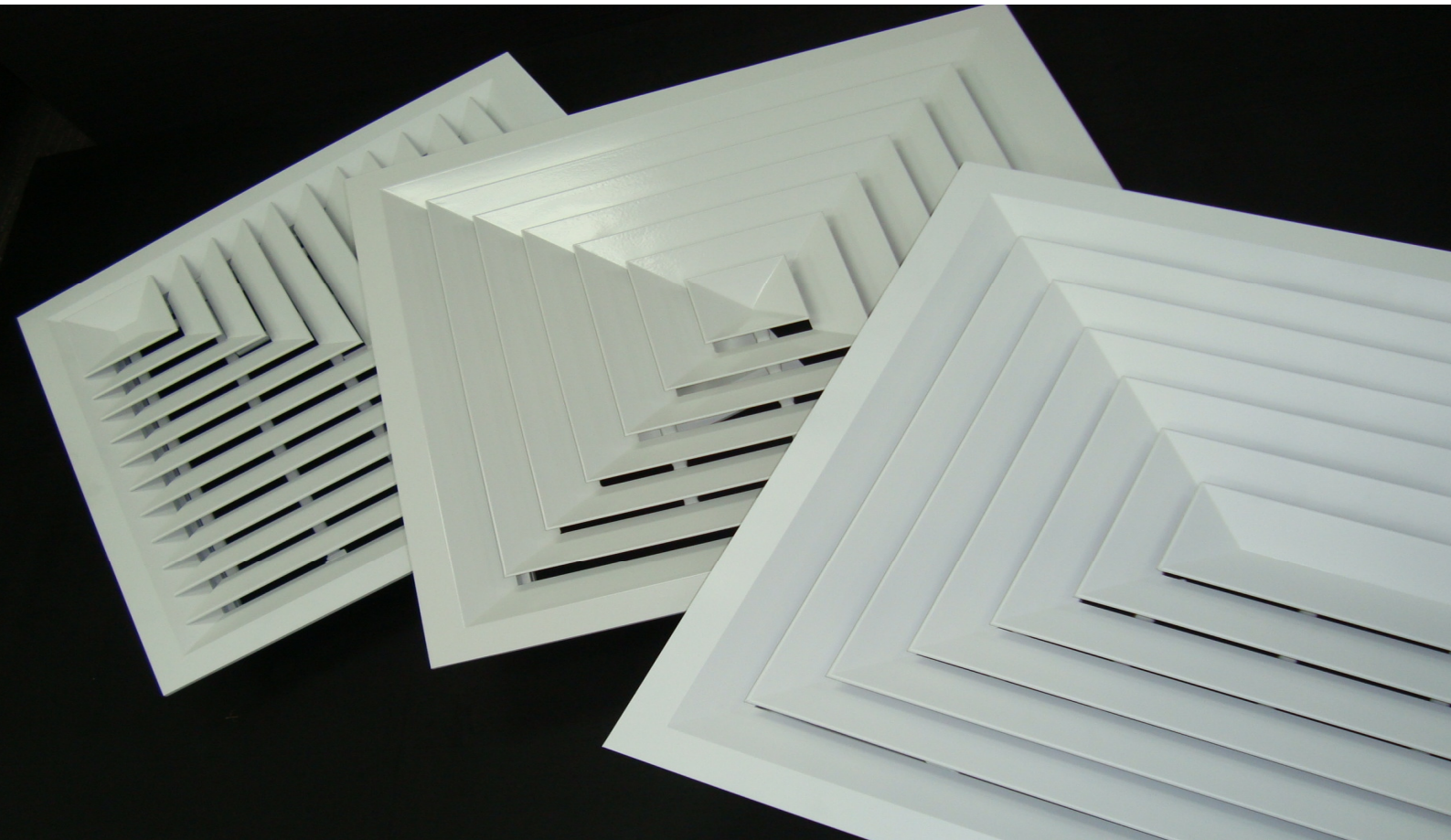


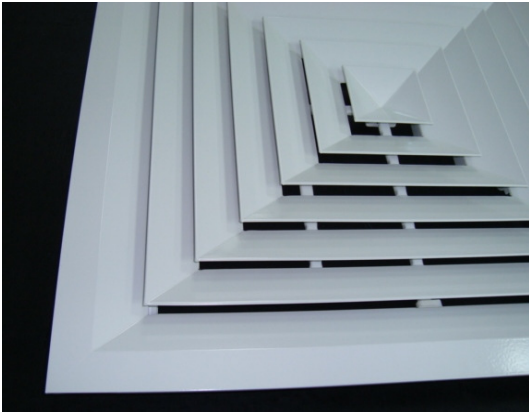


EXTRUDED ALUMINUM DIFFUSER

R. GLAZEN SINGAPORE PTE LTD

Ceiling Diffuser





CONSTRUCTION

The exposed surfaces, frame and cores are made from extruded aluminum. Opposed blade volume dampers are also made of extruded aluminum. In addition to welded butt joints, the corners are provided with a insert for robust handling during installation. The grilles are designed to withstand rough handling without distortion and separation of corner joints.

FINISHES

All ceiling diffusers are available in natural anodize finish as standard for scratch resistant. For painted finishes, the diffusers will be enamel coated and oven-baked. For other finishes, please consult R.Glazen technical representatives.

SPECIFICATIONS

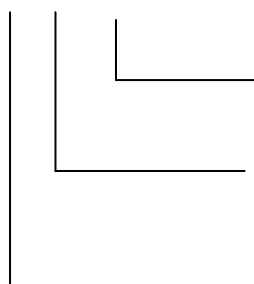
Diffusers shall be constructed with extruded aluminum of not less than 1.5mm thickness. The diffusers shall be selected based on the air volumes shown in specification drawings and the noise levels generated shall not exceed NR35.

Corners of the diffusers shall be reinforced with corner pieces and argon welded. Centre core shall be removable from bottom of diffuser without special tools. Opposed blade, extruded aluminum volume dampers shall be supplied with all supply air diffusers. Volume dampers shall be adjustable from face of diffusers with the use of screw driver. Face size of diffusers shall be 600mm x 600mm. Finishes for grilles shall be oven-baked enamel, colour shall be white unless otherwise specified.

Diffusers shall be tested to Air Diffusion Council (ADC) Standard 1062R4 or British Standard BS1042 Part 1 by an independent, accredited test laboratory.

Ordering Key:

GSD4- D (FB)-SA



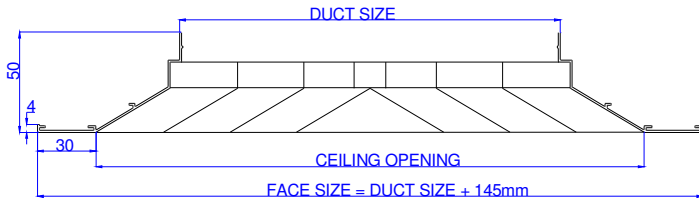
- SA** - Square Adaptor
- RA** - Round Adaptor
- PB** - Plenum Box
- FB** - With Fan Blade
- OBD** - With Opposed Blade Damper
- BD** - With Butterfly Damper (Applicable to PB only, side entry)
- D** - With Volume Control Damper
- NIL** - Without Volume Control Damper

FEATURES

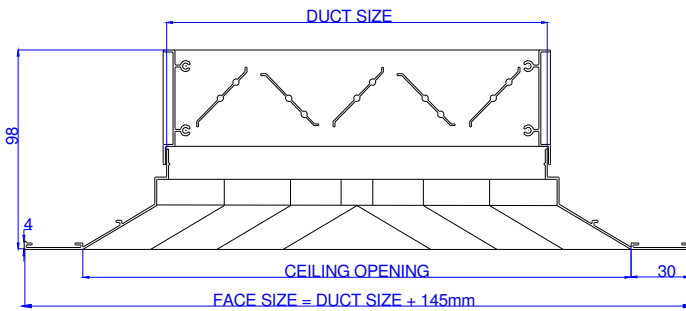
- ⇒ Glazen CSD ceiling diffusers are suitable for mounting on all types of ceiling.
- ⇒ They are designed to handle large volumes of air quietly and with good throw patterns.
- ⇒ These diffusers can be flush mounted and also "Lay-In" on to ceiling Tee-Bar.
- ⇒ Corners of the diffuser frame are reinforced with corner inserts and argon welded to maintain hairline mitre joints.
- ⇒ Made from extruded aluminum section, ceiling diffusers can be supplied with standard face sizes of 300mm x300mm, 450mm x450mm, 600 mm x600mm and 670mm x 670mm.
- ⇒ Neck sizes varies from 150mm x 150mm to 600mm x 600mm.
- ⇒ Diffusers can be supplied in square or rectangular profiles.
- ⇒ Vane assemblies are available in 1, 2, 3 and 4 way throw.
- ⇒ Diffusers can be supplied with opposed blade volume dampers for balancing of air.
- ⇒ Volume dampers can be adjusted with a screw driver from face of diffuser.
- ⇒ For ease of maintenance, the centre core can be easily removed from mounting frame for cleaning without any special tools.
- ⇒ Diffusers are made from extruded aluminum of 1.5mm thick to provide ample rigidity for handling.



DIMENSIONAL DETAILS



Ceiling Diffuser

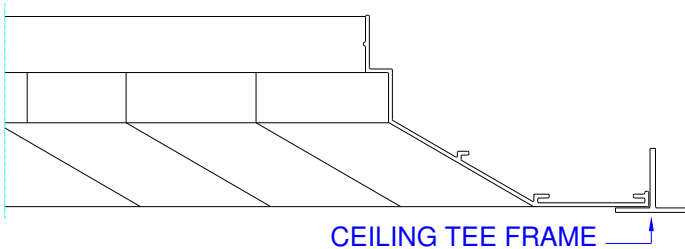


Ceiling Diffuser C/W Volume Damper

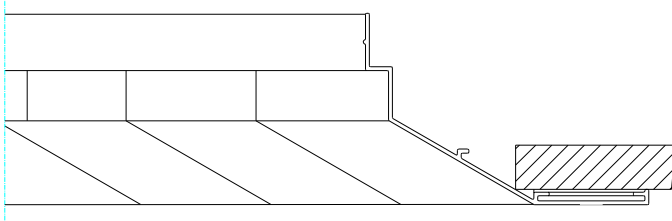
DUCT SIZE	FACE SIZE	CEILING OPENING
146 X 146	291 X 291	239 X 239
222 X 222	367 X 367	315 X 315
298 X 298	443 X 443	391 X 391
374 X 374	519 X 519	467 X 467
450 X 450	595 X 595	543 X 543
450 X 450	*605 X 605	553 X 553
525 X 525	670 X 670	619 X 619
600 X 600	745 X 745	695 X 695

* For lay-on to Imperial 1220mm x 610mm Suspended Ceiling

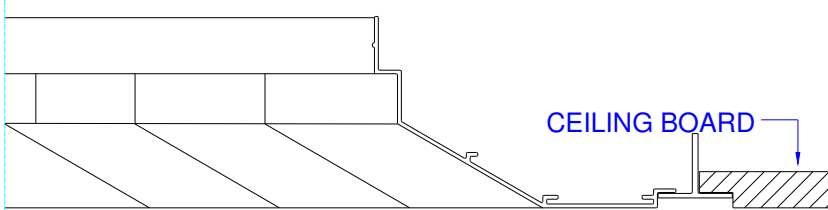
MOUNTING DETAILS



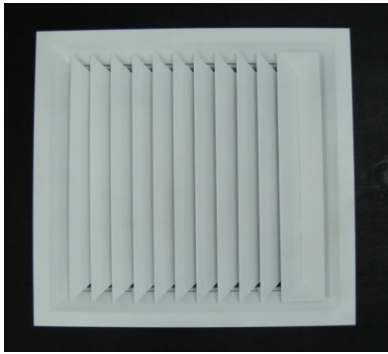
TYPE "LT"
Lay on Ceiling Tee



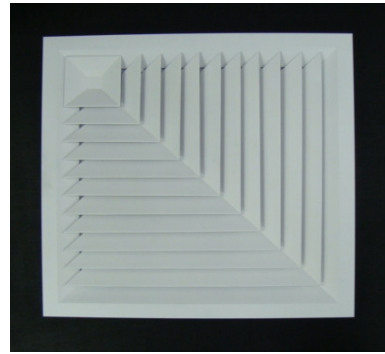
TYPE "SM"
Flush Frame Surface Mounted
(Concealed Ceiling)



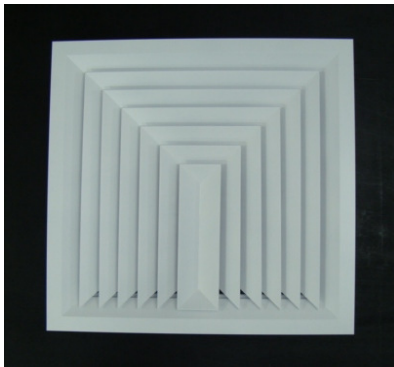
TYPE "RF"
Recess Frame on Ceiling Tee



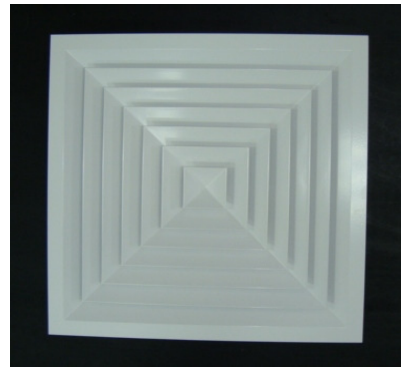
1 - WAY



2 - WAY

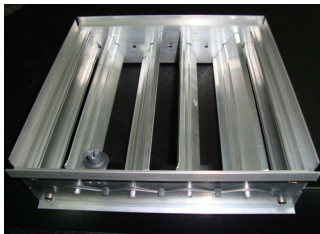


3 - WAY



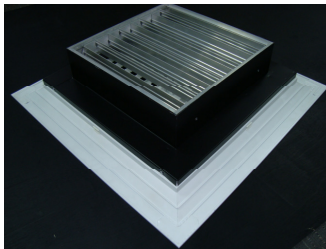
4 - WAY

ACCESSORIES



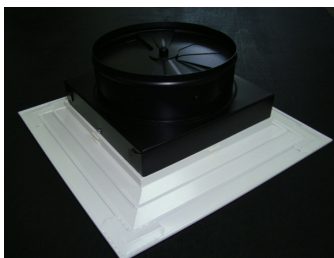
OBVD

Opposed Blade Volume Control Damper is constructed from aluminum for top entry connected to diffuser neck.



TAPERED NECK DAMPER ADAPTOR GNTA

Tapered Neck Adapter improves air distribution at the neck of diffuser of 24G GI c/w black colour finished

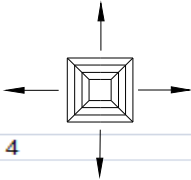
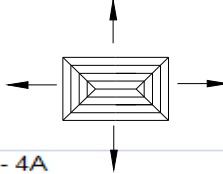
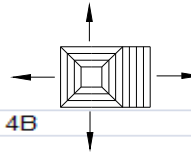
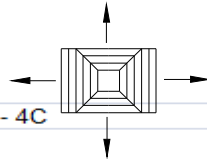
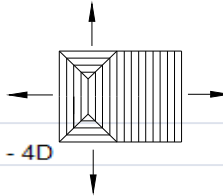
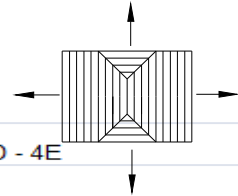
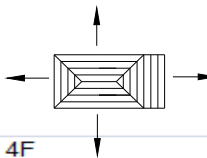
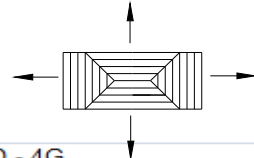
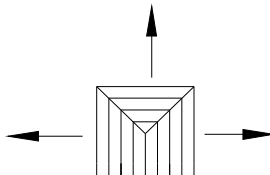
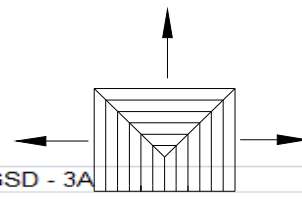
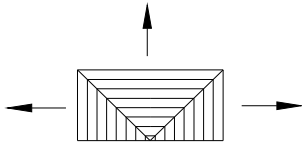
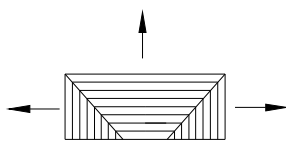


SQUARE TO ROUND ADAPTOR

Designed as a transition adaptor permitting the attachment of round duct to a square neck diffuser.



GSD-4 SERIES
Core Styles and Listed Sizes Available

STYLE	LISTED SIZE	STYLE	LISTED SIZE
 GSD - 4	148 x 148 528 x 528 224 x 224 604 x 604 300 x 300 680 x 680 376 x 376 756 x 756 452 x 452 In 76mm increments of W and H	 GSD - 4A	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H
 GSD - 4B	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 375 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H	 GSD - 4C	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 375 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H
 GSD - 4D	224 x 224 TO 756 x 224 300 x 300 TO 756 x 300 376 x 376 TO 756 x 376 452 x 452 TO 756 x 452 528 x 528 TO 756 x 528 604 x 604 TO 756 x 604 680 x 680 TO 756 x 680 756 x 756 In 76mm increments of W and H	 GSD - 4E	224 x 224 TO 756 x 224 300 x 300 TO 756 x 300 376 x 376 TO 756 x 376 452 x 452 TO 756 x 452 528 x 528 TO 756 x 528 604 x 604 TO 756 x 604 680 x 680 TO 756 x 680 756 x 756 In 76mm increments of W and H
 GSD - 4F	300 x 148 TO 756 x 148 376 x 224 TO 756 x 224 452 x 300 TO 756 x 300 528 x 376 TO 756 x 376 604 x 452 TO 756 x 452 680 x 528 TO 756 x 680 756 x 604 In 76mm increments of W and H	 GSD - 4G	300 x 148 TO 756 x 148 376 x 224 TO 756 x 224 452 x 300 TO 756 x 300 528 x 376 TO 756 x 376 604 x 452 TO 756 x 452 680 x 528 TO 756 x 528 756 x 604 In 76mm increments of W and H
 GSD - 3	148 x 148 680 x 680 224 x 224 756 x 756 300 x 300 376 x 376 452 x 452 528 x 528 604 x 604 In 76mm increments of W and H	 GSD - 3A	224 x 148 300 x 224 376 x 224 376 x 300 TO 528 x 528 452 x 376 TO 680 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H
 GSD - 3B	300 x 148 452 x 224 604 x 300 756 x 376 756 x 452 376 x 148 TO 756 x 148 528 x 224 TO 756 x 224 680 x 300 TO 756 x 300 756 x 376 In 76mm increments of W and H	 GSD - 3C	148 x 148 TO 224 x 148 224 x 224 TO 376 x 224 300 x 300 TO 528 x 528 376 x 376 TO 680 x 376 452 x 452 TO 756 x 452 528 x 528 TO 756 x 528 604 x 604 TO 756 x 604 756 x 756 TO 756 x 680 756 x 756 In 76mm increments of W and H



GSD-4 SERIES
Core Styles and Listed Sizes Available

STYLE	LISTED SIZE	STYLE	LISTED SIZE
 GSD - 3D	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H	 GSD - 3E	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 TO 756 x 680 756 x 756 In 76mm increments of W and H
 GSD - 3F	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 TO 756 x 680 756 x 756 In 76mm increments of W and H	 GSD - 2	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H
 GSD - 2A	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 756 x 680 In 76mm increments of W and H	 GSD - 2B	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H
 GSD - 2C	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H	 GSD - 2D	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H
 GSD - 2E	148 x 148 224 x 224 300 x 300 376 x 376 452 x 452 528 x 528 604 x 604 680 x 680 756 x 756 In 76mm increments of W and H	 GSD - 1	148 x 148 TO 756 x 756 224 x 224 TO 756 x 756 300 x 300 TO 756 x 756 376 x 376 452 x 452 528 x 528 604 x 604 680 x 680 In 76mm increments of W and H
 GSD - 1A	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H	 GSD - 1B	224 x 148 TO 756 x 148 300 x 224 TO 756 x 224 376 x 300 TO 756 x 300 452 x 376 TO 756 x 376 528 x 452 TO 756 x 452 604 x 528 TO 756 x 528 680 x 604 TO 756 x 604 756 x 680 In 76mm increments of W and H



PERFORMANCE DATA FOR GSD SERIES

600 x 600 FACE SIZE

SIZE in (mm)	CAP l/s	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400	450	500	600	700
150x150	S.P.	11	15	20	26	32	39	58	78											
	NR	14	1.8	22	27	30	35	40	45											
	THROW	2	3	3	3.5	4	4.5	5	5.5											
200x200	S.P.			11	14	18	22	33	45	54	73									
	NR			15	18	21	25	30	35	40	45									
	THROW			3	3.5	3.5	4	4.5	5	5.5	6									
250x250	S.P.						9	15	18	20	31	40	52	71						
	NR						15	18	21	27	31	33	40	48						
	THROW						3.5	4	4.5	5	5.5	5.5	6.5	7						
300x300	S.P.							7	9	12	17	20	27	31	54	64	90			
	NR							12	15	18	20	23	28	35	40	45	50			
	THROW							3.5	4	4.5	5	5	6	6.5	6.6	7.5	7.5			
350x350	S.P.								5	7	8	10	15	21	30	36	70	55		
	NR								11	13	15	17	21	27	31	35	39	43		
	THROW								4	4	4.5	5	5.5	6	6.5	7	7	7.5		
400x400	S.P.									6	7	8	12	17	22	28	38	43	60	
	NR									11	13	15	18	25	27	31	35	38	44	
	THROW									4.5	4.5	5	5.5	6	6.5	7	7	7.5	8	
450x450	S.P.											6	10	13	18	23	32	35	49	65
	NR											13	17	19	24	29	32	35	40	45
	THROW											5	6	6	6.5	6.5	7	7	8	8

Standard Face Size

SIZE in (mm)	CAP l/s	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400	450	500	600	700
150x150	S.P.	18	25	34	44	54	66													
	NR	20	25	30	35	40	45													
	THROW	2.5	3	3.5	4	4.5	5													
250x250	S.P.			9	11	15	18	20	30	40	55	70	100							
	NR			12	15	17	19	25	28	33	38	42	48							
	THROW			3	3.5	4	4	4.5	5	5.5	6	6.5	7							
300x300	S.P.						5	7	9	12	17	20	27	37	54	64				
	NR						10	12	15	18	20	23	28	35	40	45				
	THROW						3	3.5	4	4.5	5	5	6	6.5	7	7.5				
350x350	S.P.								6	7	9	12	18	25	32	45	55	70		
	NR								10	13	16	18	22	28	34	39	43	46		
	THROW								4.5	4.5	5	5.5	5.5	6	6.5	7	7	7.5		
450x450	S.P.											6	10	13	18	23	32	35	49	65
	NR											13	17	19	24	29	32	35	40	45
	THROW											5	6	6	6.5	6.5	7	7	8	8

- SIZE—Neck size in mm
- SP - Static Pressure are in Pa
- NR - Noise Rating based on room absorption of -8 db (as per ADC 1062 R3)
- CAP - Airflow capacity in litres/sec
- THROW - Throw to terminal velocity of 0.5m/s in meters



EFFECT OF VOLUME CONTROL ON NOISE

Opposed Blade Volume Control Dampers are used with supply and return grilles and should only serve the purpose of fine balancing.

Excessive throttling of the damper will cause substantial increase in NR. Majority of the balancing should be provided by damper upstream in the supply duct.

The additional noise level for diffusers with Opposed Blade Dampers installed is set out in the table.

Diffuser OBD Opening	NR Addition For OBD
100%	0
75%	8
50%	14
25%	21

SELECTION OF DIFFUSERS

The following are considerations for the adequate selection of diffusers:

Air Quantity and Noise Requirements

The total volume of air (L/S) transmitted into a given area to be conditioned is a function of the overall system design i.e. Total L/S = Number of Outlets x L/S per outlet. The permissible Noise Level of the conditioned area is directly related to the intended use of conditioned area.

Air Distribution Pattern

Given the shape of the space to be conditioned the pattern requirement is determined by the number of outlets in it and the incidence of any exposed beams or light fitting below the ceiling line that may effect the dispersion of air. For example, a two-way corner blow pattern– patterns GSD– 2B, 2C, 2D may be ideally situated in the corner of a room whilst in corridor a two-way opposite blow pattern– patterns GSD-2,2A, 2E may be used. For larger areas the division of the total area being conditioned into a series of overlap space modules. Usually square or rectangular, into which GSD-4, 4A pattern diffusers are installed is most common.

Throw Requirement

The required throw is usually the distance from the nearest enclosing wall or partition or to the point of intersection with the airstream of an adjacent outlet. For high ceiling areas the throw requirement may be specified as the horizontal distance described above plus the vertical distance from the outlet to the occupied zone, this vertical distance is commonly measured to extend to the 1500mm level in the room. Generally the specified throw should not exceed 1.5 times the diffuser mounting height.



RECOMMENDED NOISE CRITERIA FOR ROOMS

TYPE	SPACE	NR LEVEL	RECOMMENDED FACE VELOCITY (m/s)
Auditoriums and Music Halls	Concert and Opera Halls, Studios for sound reproduction	20 -25	2.5
	Legitimate Theatres, Multi- Purpose Halls	25 – 30	2.5 – 3.75
	Movies theatres, Lectures Halls, Planetarium, TV Audience Studios	30 -35	2.5 -3.75
	Lobbies	35 -45	2.5 -3.75
Factory Areas	Light maintenance shops, Assembly lines	40 -50	3.0 - 6.5
	Office area, control room	40 -50	3.0 - 6.5
	Heavy industrial processing	60 -75	6.5 -10.0
Churches and schools	Sancturies	20 - 30	2.5 -3.75
	Libraries, schools and classrooms	30 - 40	2.5 – 5.0
	Laboratories	35 - 45	2.5 -5 .0
	Recreation halls, corridors and halls	35 - 50	2.5 – 6.5
Hotels/ Motel	Individual Rooms, suites or Ball Rooms	30 - 40	2.5 – 5.0
	Halls, corridors, Lobbies	35 - 40	2.5 – 5.0
	Kitchen and laundries, bars and lounges	40 - 50	3.0 - 6.5
Offices	Boardroom	20 - 30	2.5 -3.75
	Executive office	30 - 40	2.5 – 5.0
	Conference rooms	25 - 35	2.5 -3.75
	General Open offices	35 - 50	2.5 – 6.5
	Halls and corridors, computer room	35 - 55	2.5 – 6.5
Hospitals and Clinics	Intensive care wards, Private room	25 - 35	2.5 -3.75
	Hospitals wards, Operating room	30 - 40	2.5 – 5.0
	Waiting rooms and reception areas	35 - 45	2.5 – 5.0
	Wash rooms and toilets	40 - 50	3.0 - 6.5
Public	Public Libraries, museums, court rooms	30 - 40	2.5 – 5.0
	Post offices, Banking Areas, Department Stores, Restaurants, Night Clubs, Bowling		
	Alleys, Gymnasiums	35 - 45	2.5 – 5.0
	Cocktail Lounges	35 – 50	2.5 – 6.5
Transportation	Ticket sales offices	30 – 40	2.5 – 5.0
	Lounges, Waiting Rooms	35 -50	2.5 – 6.5
Stores Retail	Clothing Stores, Department Stores (upper Floor)	35 – 45	2.5 – 5.0
	Department Stores (main floor), small		
	Tetail Stores, Supermarkets	40 -50	3.0 - 6.5



EXTRUDED ALUMINUM DIFFUSER

R. GLAZEN SINGAPORE PTE LTD

PERFORMANCE TESTING

Units of the grilles have been tested at independent N.A.T.A. accredited test laboratory in Australia. Test reports can be provided on request.

Throw and Noise Rating (NR) found in the performance data of this catalogue is based on distance measured from the diffuser to the furthest point where the velocity is 0.5m/s and room absorption of 8 dB in accordance to the recommendation of Air Diffusion Council.

WARRANTY

R.GLAZEN SINGAPORE PTE LTD (the "Company") warrants that all goods in this catalogue that have been manufactured by the Company will be defects free in quality or material under normal use and service for a period of one year after goods are sold. The Company have the right to make improved changes to the products at any time. The company is obligated under this warranty, only to replace any product which is defective in quality or material under normal use and service within such period. Component parts or accessories which are covered by the warranty of the manufacturer will not be covered under this warranty. Any improper use of the product, after defective or worn parts had been discovered, accident or any modification or repair by others which the Company claims that it will materially and adversely affects the products, neglect substitution of parts not approved by the company, will void this warranty.

No person is authorized to assume any liability with respect to any goods sold, for the Company. No representatives or employee is authorized to change this warranty or give any other warranty, unless it is authorized By an officer of the Company at its home office in writing. In any event of payment of incidental or consequential damages, including without limitation, delay costs or damages for property or injury to persons, the company shall have no liability whatsoever.

Claims under this warranty, if not submitted, in writing and received by the company within thirty (30) days of the date to which each claim relates, is discovered or should have been discovered, will be deemed waived.



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