

COMPRESSOR PARTS – TECHNICAL SPECIFICATIONS



In order to vindicate our slogan of “Unsurpassable Quality of Compressor Spare Parts”, we request you to visit our product wise details.

Apart from Dimensional Accuracy, we are maintaining high standards for Material of Construction (M.O.C.) and processing in order to achieve required properties. For us, fitment of a component is always important. But at the same time, we supply components which provide longer life.

Therefore, we request you to click on Dialogue Box of **“More Detailed Information”** to search Complete Product Wise Technical Details, which we maintain. These details are generalised for all types of Air-Conditioning Compressors as well as Air Compressors.

After scrutinising, if you feel that we know our job, then kindly search for the Make, Model and parts of your interest and send us your valued Purchase Enquiry.

(01) COMPRESSOR VALVES & PERIPHERALS



(A) AIR-CONDITIONING & REFRIGERATION COMPRESSORS:

PRODUCT	M.O.C.	PROCESS	PROPERTIES	SIZE
Valve Assembly		Valve Seat, Valve Guard, Valve Rings/Reeds, Wavy Springs or Valve Springs are assembled with Bolts & Nuts.	Valve Lift is maintained @ 1.5 mm. Leakage Testing is done on Electro-Pneumatic Testing Rig.	Present 300 mm Max. 550 mm
Valve Seat	SGI Gr 600/2 (IS 1865) or En-9	Castings are Shell Moulded, Shot Blasted & Annealed. Then, Seats are Machined, Ground & Lapped. Seats are phosphated.	Hardness 200-220 BHN. Flatness of Seats checked for Light Bands.	Present 300 mm Max. 550 mm
Valve Guard/ Stroke Limitor	SGI Gr 600/2 (IS 1865)	Castings are Shell Moulded, Shot Blasted, Annealed & then Machined. Guards are Phosphated.	Hardness 200-220 BHN	Present 300 mm Max. 550 mm
Valve Rings/Reeds	Sandvik Gr 17 SS420	Laser/Water Jet Cut, Heat Treated, Ground, Deburred & Lapped	Hardness @ 50 HRC; Flatness within 10 microns Checked for Light Bands.	Present 225 mm Max. 500 mm
Lentoid/Wavy Springs	Sandvik Gr. 17	Laser/Water Jet Cut, Formed, Heat Treated & Deburred	Hardness @ 42-45 HRC	Present 200 mm Max. 500 mm
Valve Springs.	IS 4454 Gr 2	In Wire/Flat Plate Form; Formed, Heat Treated & Ground on both faces.	Hardness @ 40-45 HRC	
Valve Bolts/Nuts	En 19	Toughened, Machined & Die Threaded	Hardness @ 260-280 BHN	Present M60

(B) AIR COMPRESSORS:

PRODUCT	M.O.C.	PROCESS	PROPERTIES	SIZE
Valve Assembly		Leakage Testing on Electro-Pneumatic Testing Rig.	Valve Lift is maintained @ 1.5 mm. Leakage Testing is done on Electro-Pneumatic Testing Rig.	Present 450 mm Max. 550 mm
Valve Seat/Body	SS 410	If in Investment Castings, Seats are Solution Annealed to achieve higher wear resistance. Seats are manufactured from Bar Stock, as well, by milling the grooves. Seats are, then, machined, ground, lapped & deburred.	Hardness 200-220 BHN. Flatness of Seats checked for Light Bands.	Present 450 mm Max. 550 mm
	CI Grade 25 (IS 210-1962)	Castings are shell moulded, shot blasted & annealed. Then machined, ground, lapped & deburred. Hard Chrome/Electroless Nickel Plated if necessary.	Hardness 200-220 BHN. Flatness of Seats checked for Light Bands. Hardness of Hard Chrome/EN Plating @ 710 VHN.	Present 300 mm Max 550 mm
Valve Guard/Stop Plate	SS 410	If in Investment Castings, Seats are Solution Annealed to achieve higher wear resistance. Seats are manufactured from Bar Stock, as well, by milling the grooves. Guards are, then, machined & deburred.	Hardness 200-220 BHN.	Present 450 mm Max. 550 mm
	CI Grade 25	Castings are shell moulded, shot blasted & annealed. Then machined & deburred. Hard Chrome/Electroless Nickel Plated if necessary.	Hardness 200-220 BHN. Hardness of Hard Chrome/EN Plating @ 710 VHN.	Present 300 mm Max 550 mm
Valve Plate/Ring, Cushion/Damper Plate, Channel, Plate Seat	SS 410	Laser/Water Jet Cut, Heat Treated, Ground, Lapped & Deburred.	Hardness 43-45 HRc; Flatness within 10 microns Checked for Light Bands.	Present 394 mm Max. 500 mm.
Spring Plates	En 47	Laser/Water Jet Cut, formed, heat treated & deburred.	Hardness 42-45 HRc.	Max. 500 mm.
Lift Washers	SS 420	Laser/Water Jet Cut, Heat Treated, Ground, Lapped & Deburred.	Hardness 42-45 HRc; Flatness within 10 microns Checked for Light Bands.	
Valve Springs	AISI-631	It is a Precipitation Hardenable Austenitic Stainless Steel. Springs are formed, Heat Treated & ground on both faces.	Hardness 42-45 HRc.	
Valve Bolts & Nuts	SS 410 En-19	Machined, Toughened & Die-Threaded	Hardness @ 280 BHN	
	En 24	Machined, Toughened & Die-Threaded.	Hardness @ 280 BHN	

1. PISTON & PARTS OF ASSEMBLY



(A) AIR-CONDITIONING & REFRIGERATION COMPRESSORS:

PRODUCT	M.O.C.	PROCESS	PROPERTIES	SIZE
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Pistons	Alu. Alloy Gr LM-13WP (IS 617)	Pressure Die/Gravity Cast, "T5" Heat Treatment; OD Ground & ID Bored	Hardness @ 100-150 BHN	Present 180 mm Higher size possible
Piston Rings	Grey CI Gr 25 – Pearlitic Structure	Annealed, Ground, Deburred & Lapped; Top Ring Chrome Plated	Hardness @ 200-220 BHN	Present 180 mm Higher size possible
Gudgeon Pin/ Piston Pin	En-353 (815M17) (BS970 Part 3-1977)/ En32B (BS 970)/ 15Cr3 DIN 17210	Case Carburised & Hardened; Case Depth: OD 1.20-1.70 mm after Grinding & ID 0.6-0.9 mm; Ground & Lapped	Hardness 60±2; Crack Detection on OD by Ultrasonic/Magnaflux & on ID by Dye Penetration	Present 150 mm Higher size possible
Lock Bolts/Plates/ Circlips		As per design of different manufacturers		

(B) AIR COMPRESSORS:

PRODUCT	M.O.C.	PROCESS	PROPERTIES	SIZE
L.P. Piston (BOP)	Aluminium Alloy Casting (Chilled Cast) Gr. 4685 (IS617-1975)	"T5" Heat Treatment, Machined & Ground. Finished Piston subjects to Dye Penetration Test.	Hardness 100-150 BHN Tensile Strength 29 Kg/sq. mm. min	Present 600 mm
H.P. Piston (BOP)	CI Grade FG-260 (IS210-1978) or Fe-410S (IS226-1975)	Castings are shot blasted & annealed. After Machining & Grinding, finished Piston undergoes Dye Penetration Test.	Hardness – 220-260 BHN	Present 450 mm
Piston Ring -Lubricated Model	Grey Cast Iron Gr. 25 (Pearlitic Structure)	Annealed castings are Machined, Ground & Lapped.	Hardness 200-220 BHN	Present 600 mm Higher Size possible.
Piston/Compression Ring & Guide/Wear/Rider Rings – Non Lubricated Model	25% Carbon filled PTFE.	Rings are moulded & sintered in bush form. Rings are manufactured from the bushes as per dimensions & tolerances of Compressor Manufacturers.	Finished Rings have Hardness of 63 on Shore's "D" Scale & Tensile Strength of 18.6 MPa.	Present 600 mm Higher Size possible.
Gudgeon Pin/ Piston Pin	En-353 (815M17) (BS970 Part 3-1977) or En-32B (BS970) or 15Cr3 (DIN 17210)	Semi-finished Pins are Case Hardened, Ground & Lapped.	Hardness 60 ± 2 HRc. Case Depth O.D. 1.2-1.7 mm after grinding & I.D. 0.6-0.9 mm. No lobe is permitted. Crack detection of O.D. by Ultrasonic/Magnaflux & I.D. by Dye Penetration.	Present 150 mm Higher Size possible.
Piston Rod	AISI 420 Small Dia.	Machined, Heat Treated to 210-260 BHN, Hard Chrome Plated & Ground.	Hardness @ 710 VHN of Hard Chrome. Tensile Strength 64 Kg/sq.mm. min. Crack detection is by Ultrasonic/ Magnaflux Testing. Checked for concentricity & Face Squareness by "V" block.	Specifications are till Dia. 30 mm
	826M40 (Y) High Dia. {En-26(Y)} (BS970 Part2-1970)	Machined, Heat Treated to 365-430 BHN, Hard Chrome Plated & Ground.	Hardness @ 710 VHN of Hard Chrome. Tensile Strength 128-145 Kg/sq.mm. Crack detection is by Ultrasonic/ Magnaflux Testing. Checked for concentricity & Face Squareness by "V" block.	Specifications are for above Dia. 30 mm

Crosshead	Grey Cast Iron Gr. 25 FG260 (IS210-1978)	Castings are shot blasted & annealed, then machined & ground on O.D. & bored on I.D.	Crack detection by Dye Penetration test.	Present 300 mm Higher size possible.
Gland Packing – Lubricated Model	Bearing Alloy Grade 90	Machined, Slit & Bored	End Gap Clearance as per standard to prevent Air scavenging.	Present 60 mm Higher size possible.
Gland Packing – Non Lubricated Model	25% Carbon filled PTFE.	Packings are moulded & sintered in bush form & then machined as per dimensions & tolerances of Compressor Manufacturers.	Finished Rings have Hardness of 63 on Shore's "D" Scale & Tensile Strength of 18.6 MPa. End Gap Clearance as per standard to prevent Air scavenging.	Present 60 mm Higher size possible.
Oil Wiper Ring - Non Lubricated Model	Bearing Alloy Grade 6	Machined, Slit & Bored	End Gap Clearance as per standard to wipe out oil from Crosshead back to Crankcase.	Present 60 mm Higher size possible.
Piston Head Nut / Piston Washer	En-9 / SS 410	Heat Treated & machined within tolerances	Hardness 200-255 BHN Tensile Strength 70 Kg/sq. mm. min.	



BOTH ACR & AIR COMPRESSORS:

PRODUCT	M.O.C.	PROCESS	PROPERTIES	SIZE
Connecting Rod	SGI Grade 600/7 (IS1865-1974) SGI Grade 600/3 (IS1865-1974) (for Both Types)	Shot Blasted, Annealed & then Machined & Bored to required dimensions.	Axis of Small & Big End Bores are parallel, Side Faces of the both are perpendicular to the bores & Bores are perpendicular to Centre Line of Connecting Rod. Tolerance for Centre Distance of bores is kept within 0.1 mm. Parallelism and Squareness with central axis is checked. Crack detection by Dye Penetration. Hardness 190-270 BHN	Present 150 mm Big End
	LM 13WP BS1490 – 1970 (ACR Compressors)	Forged, Stress Relieved, Machined & Bored to required dimensions.	Axis of Small & Big End Bores are parallel, Side Faces of the both are perpendicular to the bores & Bores are perpendicular to Centre Line of Connecting Rod. Tolerance for Centre Distance of bores is kept within 0.1 mm. Parallelism and Squareness with central axis is checked. Crack detection by Ultrasonic/Magnaflux method.	Present 60 mm Big End
Bolts & Nuts	En-24	Heat Treated, Machined, Die Threaded & Ground.	Hardness 260-280 BHN	
Big End Bearing/ Conn. Rod Bearing (ACR Compressors)	White Metal Lined (90% Sn, 3.5% Cu & 6.5% Sb)	Bearing material is cast or roll-bonded on Back-up Strip	Crack detection by Dye Penetration Test.	Present 150 mm. Higher size possible.
Big End Bearing/	M.O.C. is Copper	Principal bearing material	Crack detection by Dye	Present 150 mm.

Conn. Rod Bearing (AIR Compressors)	Lined Thin/Thick Wall White Metal (80% Sn, 18-19% Pb & 1-2% Sn) Bearings. Back-up strips are in low Carbon Steel. In case of Thick Wall Bearings, back-up is in casting of low Carbon Steel/Bronze.	is cast or roll-bonded on Strips, in case of Thin Wall Bearings. Principal bearing material is cast or roll-bonded on machined castings, in case of Thick Wall Bearings.	Penetration Test.	Higher size possible.
Small End Bush/ Piston Pin Bush/ Gudgeon Pin Bush	Phosphor Bronze Gr PB1 (IS28-1975)	Machined and OD & ID Ground	Hardness 90-130 BHN	Present 150 mm Higher size possible

(04) CRANKSHAFT & PARTS:



PRODUCT	M.O.C.	PROCESS	PROPERTIES	SIZE
Crankshaft	SGI Gr 600/3 (IS 1865)	Crankshafts are Machined & Ground to required sizes & then Dynamically Balanced @ double the speed of Compressor, by using Bob Weights.	Inspected on Shadowgraph for junction radii, which is followed by Dye Penetration Test.	Present Crankpin Dia. 150 mm & Length 2500 mm. Higher sizes possible.
	En-8 or En-9 (BS 970-1955)	Normalised forgings are heat treated after proof machining. Then ground	Crack detection by Ultrasonic/ Magnaflux Method & then demagnetised.	Present Crankpin Dia. 150 mm & Length 2500 mm.

		& Dynamically balanced @ double the speed of Compressor, by using Bob Weights.	Hardness 220-270 BHN U.T.S. @ 75 Kg/sq. mm.	Higher sizes possible.
Main Bearings (ACR Compressors)	White Metal Lined (90% Sn, 3.5% Cu & 6.5% Sb)	Bearing material is cast or roll-bonded on Back-up Strip	Crack detection by Dye Penetration Test.	Present 150 mm. Higher size possible.
Main Bearings (AIR Compressors)	M.O.C. is Copper Lined Thin/Thick Wall White Metal (80% Sn, 18-19% Pb & 1-2% Sn) Bearings. Back-up strips are in low Carbon Steel. In case of Thick Wall Bearings, back-up is in casting of low Carbon Steel/Bronze.	Principal bearing material is cast or roll-bonded on Strips, in case of Thin Wall Bearings. Principal bearing material is cast or roll-bonded on machined castings, in case of Thick Wall Bearings.	Crack detection by Dye Penetration Test.	Present 150 mm. Higher size possible.
Bearing Washers/ Thrust Washers	Phosphor Bronze Gr PB1 (IS28-1975) (Bronze) En-31 (Steel)	Face Ground & Lapped Heat Treated, ground & lapped.	Hardness 90-130 BHN Hardness @ 45 HRc	Present 150 mm Higher size possible

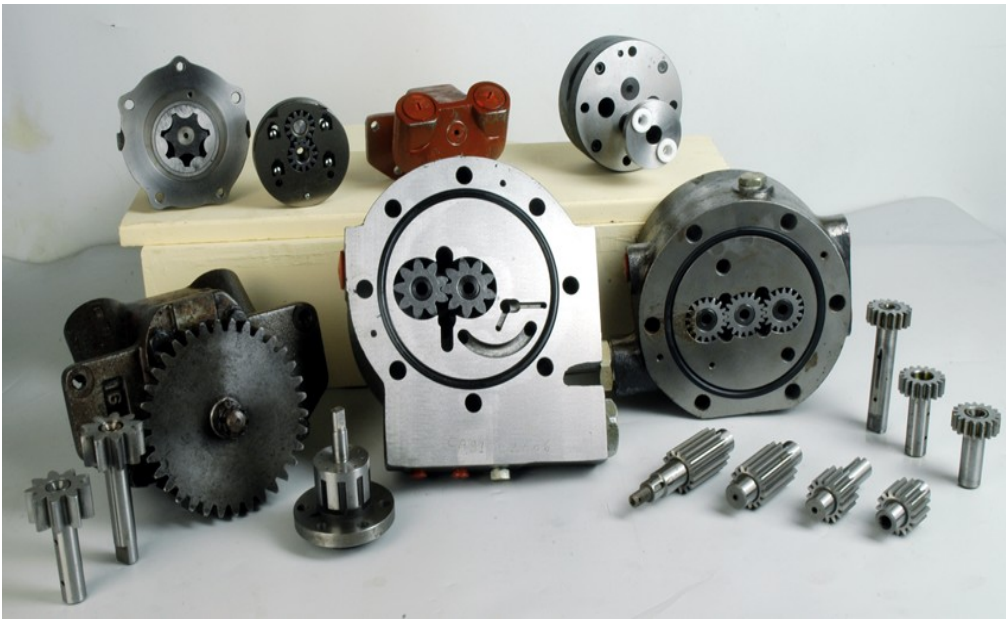
(05) CYLINDER LINERS & ASSEMBLY PARTS:



AIR-CONDITIONING & REFRIGERATION COMPRESSORS:

PRODUCT	M.O.C.	PROCESS	PROPERTIES	SIZE
Cylinder Liner	Graded CI with Mn 04.-1.2%	Shot Blasted, Annaled, OD is ground & ID is bored & honed	Hardness 230-240 BHN Pearlitic Matrix with Uniform Distribution of Phosphides	Present 180 mm Max. 350 mm
Lever Assembly for Liner	SGI Gr 500/7 (IS 1865)	Shot Blasted & Annealed	Hardness 200-220 BHN	

(06A) OIL PUMP & PARTS:



PRODUCT	M.O.C.	PROCESS	PROPERTIES	SIZE
Housing & Cover	S.G. Iron Grade 500/7 (IS 1865)	Castings are Shot Blasted, Annealed & then machined as per design.	Hardness 220-260 BHN Dye Penetration Testing is done.	
Gears & Shafts	IS 1570 Grade C-40	Gears are Machined, Milled, Ground on surface & O.D. and Deburred	Hardness @ 280 BHN Driving shaft is tempered at the end.	
Bush	Aluminium/ Phosphor Bronze	Machined, OD ground & ID bored		
Testing		All the parts are assembled in the housing.	Tested on Fixture to check desired oil pressure.	

(06B) SHAFT SEAL/ MECHANICAL SEALS:



Shaft Seals are either Multi Spring Type or Single Spring Type or Bellow (Metallic or Neoprene) Type. MOC is of various types, for different models. Sealing Surfaces are lapped with Diamond Paste & inspected for Light Bands.

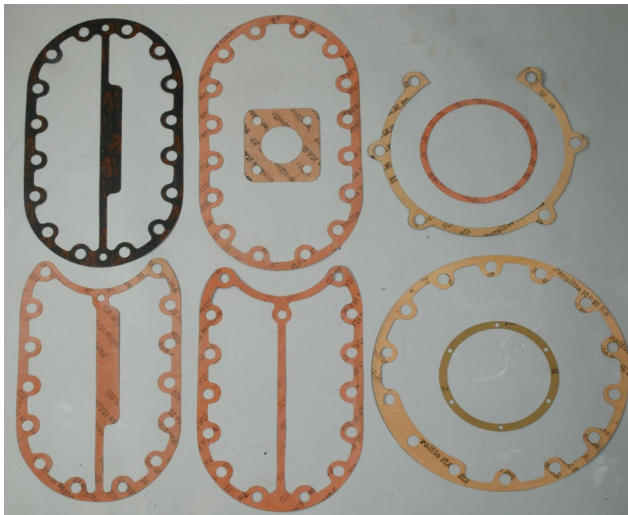
PRODUCT	M.O.C.	PROCESS	PROPERTIES	SIZE
Rotary Ring	En-9	Heat Treated, Ground & Lapped by Diamond Paste.	Inspected for Light Bands	Present ID 150 mm Higher size possible
Stationary Sealing Ring	Phosphor Bronze (PB-2)	Heat Treated, Machined, Ground & Lapped by Diamond Paste.	Hardness 90-130 BHN	Present 150 mm Higher size possible.
	Metallic Carbon	Moulded, Heat Treated, Machined, Ground & Lapped by Diamond Paste	Shore's D Scale 68	Present 150 mm Higher size possible.
Bellow	Metallic or Neoprene	As per design		
O Ring	Viton/HNBR/ Neoprene	Moulded at 45 degrees so flash will not cause any leakage.	Shore's A Scale 70	

(07A) O RINGS, SEALING RINGS/WASHERS & RUBBER GASKETS:



We supply "O" Rings in Viton, Silicon, HNBR, NBR, Neoprene & Nitrile material. O Rings are Die Moulded & Heat Treated wherever necessary.
Hardness – Shore's A Scale 67 - 70
Maximum size: 900 mm x 900 mm

(07B) GASKETS, ALUMINIUM PACKINGS & CONNECTOR PARTS:



We supply Asbestos Gaskets as well as **Asbestos Free** Gaskets. Gaskets are, normally, cut by Die/Punch as per design.

