

# BALL TRANSFER UNITS



**LUIS APARICIO, SL**

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## | CONSTRUCTION

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Ball transfer units are composed of a large precision ball rolling on a bed of small precision balls seated in a hardened hemispheric cup. All the balls are ground and heat treated in order to develop the highest load carrying capacity and lowest torque. The construction allows the large ball to rotate freely and immediately in any direction. Friction is extremely reduced and a smooth movement is provided at speed 2m/sec. Very heavy loads can be easily moved with low effort. Machined Heavy Duty units are studied for heavy shock loads and long life applications. Pressed Light Duty units are suitable for light loads. The manufacturing range includes ball transfer units with main supporting balls from 8mm (5/16") up to 90mm (3.1/2" Diameter) in steel, stainless steel or polyacetal material and loading capacities up to 2.000 KGS. (4.500 pounds). The housings of the units are bright metal zinc plated or completely in stainless steel and they are incorporating self cleaning bottom holes and oiled felt sealing system (except SP - 8/12/15). This is available on request on SP 15 & 25 series only.

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## | APPLICATIONS

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Ball transfer units are widely used in all industries to allow freely conveying in any direction of heavy loads with low stress. Most popular applications include: aircraft transport cargo rolling decks, sheet-metal-working machines, folding presses, ball-transfer tables, lifting equipment & platforms, conveyors, marble working machines, ceramic tiles and bricks machines, transporters for containers & pallets, sliding walls, doors & windows, robotics, electronics.

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## | HOW TO DETERMINE THE TYPE, NUMBER & DISTANCE

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TYPE & NUMBER. Ball size loading capacity & the loading placed on each ball transfer unit is normally provided by the weight of charge divided by 3. The result gives the highest load which any individual ball transfer unit may have to support. A suitable security charge margin is suggested. It is important that the load must be supported through the centre line of the unit. Downwards & sideways applications will affect relative loading capacities.

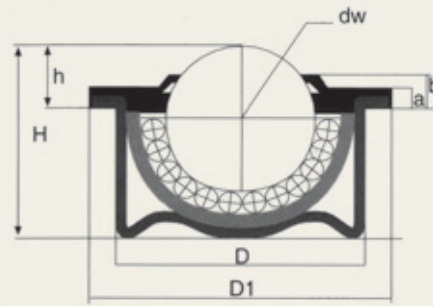
DISTANCE. In order to determine the distance between the ball transfer units divide the shortest horizontal distance by 2.50. For example, for a weight measuring across the base 500 mm. x 1.000 mm. the recommended distance will be 200 mm. (500 mm. : 2,50).

TEMPERATURE RESISTANCE. Generally -30°C + 100°C (212 F), +70° continuous and + 100°C intermittent, do not affect the running and quality. Without sealing, temperatures up to + 150/200°C are possible. Higher or lower temperatures will affect loading capacities.

FRICITION. At speed of 1 m./sec., friction will be around 0.005y. However this is subjected to considerable deviations according to the specific applications of the ball transfer units.

## I LIGHT-DUTY-TYPE "SPS" SERIE

PRESSED STEEL BALL TRANSFER UNITS WITH HARDENED BALL RACE. ZINC PLATED BODY, OILED FELT SEALING SYSTEM INCORPORATED IN TYPES SPS 22 AND 30 ONLY. MAX. TEMP. +100°C - 30°C



| TYPE      | Specification   | Dw | D  | Tol    | D1 | h    | Tol  | H    | a   | b   | Kg      |           |       |
|-----------|---|----|----|--------|----|------|------|------|-----|-----|---------|-----------|-------|
|           |   |    |    |        |    |      |      |      |     |     | Load UP | U. weight |       |
| SPS 15 B  | ZINC PLATED BODY AND STEEL BALLS  | 15 | 24 | ±0,065 | 31 | 9,5  | ±0,2 | 20,7 | 2,8 | 6,3 | 50      | 20        | 0,038 |
| SPS 22 B  |   | 22 | 36 | ±0,080 | 45 | 9,8  | ±0,2 | 29,5 | 2,8 | 5,5 | 130     | 52        | 0,132 |
| SPS 30 B  |   | 30 | 45 | ±0,080 | 55 | 13,8 | ±0,3 | 37   | 4   | 8,3 | 250     | 100       | 0,265 |
| SPS 15 C  | ZINC PLATED BODY AND STAINLESS STEEL BALLS TYPE AISI 420  | 15 | 24 | ±0,065 | 31 | 9,5  | ±0,2 | 20,7 | 2,8 | 6,3 | 37      | 15        | 0,038 |
| SPS 22 C  |   | 22 | 36 | ±0,080 | 45 | 9,8  | ±0,2 | 29,5 | 2,8 | 5,5 | 97      | 39        | 0,132 |
| SPS 30 C  |   | 30 | 45 | ±0,080 | 55 | 13,8 | ±0,3 | 37   | 4   | 8,3 | 190     | 76        | 0,265 |
| SPS 15 SS | COMPLETELY S.S. BODY AISI 304 WITH S.S. HARDENED BALL RACE AISI 420 AND ALL S.S. BALLS AISI 420 | 15 | 24 | ±0,065 | 31 | 9,5  | ±0,2 | 20,7 | 2,8 | 6,3 | 37      | 15        | 0,038 |
| SPS 22 SS |   | 22 | 36 | ±0,080 | 45 | 9,8  | ±0,2 | 29,5 | 2,8 | 5,5 | 97      | 39        | 0,132 |
| SPS 30 SS |   | 30 | 45 | ±0,080 | 55 | 13,8 | ±0,3 | 37   | 4   | 8,3 | 190     | 76        | 0,265 |



Load UP

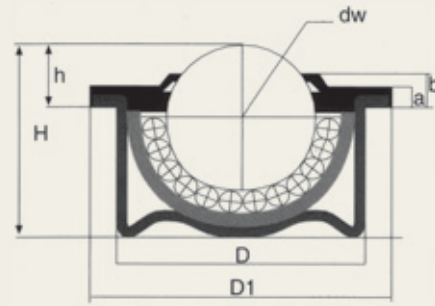


Load DOWN




## I LIGHT-DUTY-TYPE "SPS" SERIE WITH PLASTIC BALL

WITH LARGE BALL IN POM(POLYACETAI – DELRIN 500P) WITHOUT SEALING SYSTEM (NOT SUITABLE FOR BALL DOWN APPLICATION)



| TYPE        | Specification  | Dw | D  | Tol    | D1 | h    | Tol  | H    | a   | b   | Loading capacity |           |
|-------------|--|----|----|--------|----|------|------|------|-----|-----|------------------|-----------|
|             |  |    |    |        |    |      |      |      |     |     | Kg               | U. weight |
| SPS 15 B-D  | ZINC PLATED BODY, LARGE BALL IN POLYACETAL AND SMALL BALLS IN STEEL                                    | 15 | 24 | ±0,065 | 31 | 9,5  | ±0,2 | 20,7 | 2,8 | 6,3 | 7                | 0,024     |
| SPS 22 B-D  |  | 22 | 36 | ±0,080 | 45 | 9,8  | ±0,2 | 29,5 | 2,8 | 5,5 | 10               | 0,093     |
| SPS 30 B-D  |  | 30 | 45 | ±0,080 | 55 | 13,8 | ±0,3 | 37   | 4   | 8,3 | 15               | 0,168     |
| SPS 15 C-D  | ZINC PLATED BODY, LARGE BALL IN POLYACETAL AND SMALL S.S. BALLS AISI 420                               | 15 | 24 | ±0,065 | 31 | 9,5  | ±0,2 | 20,7 | 2,8 | 6,3 | 7                | 0,024     |
| SPS 22 C-D  |  | 22 | 36 | ±0,080 | 45 | 9,8  | ±0,2 | 29,5 | 2,8 | 5,5 | 10               | 0,093     |
| SPS 30 C-D  |  | 30 | 45 | ±0,080 | 55 | 13,8 | ±0,3 | 37   | 4   | 8,3 | 15               | 0,168     |
| SPS 15 SS-D | COMPLETELY S.S. BODY AISI 304 WITH S.S. BALL RACE AISI 420, MAIN PLASTIC BALL AND SMALL BALLS AISI 420 | 15 | 24 | ±0,065 | 31 | 9,5  | ±0,2 | 20,7 | 2,8 | 6,3 | 7                | 0,024     |
| SPS 22 SS-D |  | 22 | 36 | ±0,080 | 45 | 9,8  | ±0,2 | 29,5 | 2,8 | 5,5 | 10               | 0,093     |
| SPS 30 SS-D |  | 30 | 45 | ±0,080 | 55 | 13,8 | ±0,3 | 37   | 4   | 8,3 | 15               | 0,168     |

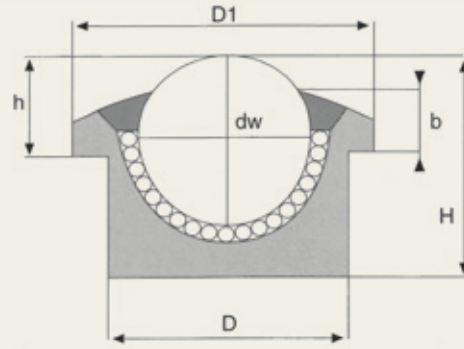
 Load UP



## I HEAVY-DUTY-TYPE "SPM" SERIE

BODY IN MACHINED & CASE HARDENED LOW CARBON STEEL ;  
BALLS IN CHROME STEEL AISI 52100 FOR TYPES SPM 30- 45  
ONLY. BALLS IN CARBON STEEL AISI 1010/1075 FOR REMAINING  
TYPES.

SELF CLEANING HOLE INCORPORATED IN ALL UNITS. OILED FELT  
SEALING SYSTEM INCORPORATED IN SPM22/30/45 TYPES ONLY  
(SPM 15/25 TYPES ON REQUEST ONLY) TEMPERATURES + 100° C  
- 30°C



| TYPE      | Specification   | Dw | D  | Tol    | D1   | h    | Tol  | H    | b   | Kg      |           |           |
|-----------|---|----|----|--------|------|------|------|------|-----|---------|-----------|-----------|
|           |   |    |    |        |      |      |      |      |     | Load UP | Load DOWN | U. weight |
| SPM 12 A  | BRIGHT METAL MACHINED BODY AND<br>STEEL BALLS                           | 12 | 22 | ±0,030 | 27,3 | 7,5  | ±0,2 | 16,8 | 4,5 | 30      | 12        | 0,035     |
| SPM 15 A  |   | 15 | 24 | ±0,065 | 31   | 9,5  | ±0,2 | 21   | 5,5 | 60      | 24        | 0,055     |
| SPM 22 A  |   | 22 | 36 | ±0,080 | 45   | 9,8  | ±0,2 | 30,5 | 6   | 180     | 72        | 0,185     |
| SPM 30 A  |   | 30 | 45 | ±0,080 | 55   | 13,8 | ±0,3 | 36,8 | 8   | 350     | 140       | 0,365     |
| SPM 45 A  |   | 45 | 62 | ±0,095 | 75   | 19   | ±0,4 | 53,5 | 10  | 600     | 240       | 0,990     |
| SPM 12 B  | ZINC PLATED MACHINED BODY AND<br>STEEL BALLS                            | 12 | 22 | ±0,030 | 27,3 | 7,5  | ±0,2 | 16,8 | 4,5 | 30      | 12        | 0,035     |
| SPM 15 B  |   | 15 | 24 | ±0,065 | 31   | 9,5  | ±0,2 | 21   | 5,5 | 60      | 24        | 0,055     |
| SPM 22 B  |   | 22 | 36 | ±0,080 | 45   | 9,8  | ±0,2 | 30,5 | 6   | 180     | 72        | 0,185     |
| SPM 30 B  |   | 30 | 45 | ±0,080 | 55   | 13,8 | ±0,3 | 36,8 | 8   | 350     | 140       | 0,365     |
| SPM 45 B  |   | 45 | 62 | ±0,095 | 75   | 19   | ±0,4 | 53,5 | 10  | 600     | 240       | 0,990     |
| SPM 12 C  | ZINC PLATED MACHINED BODY AND<br>STAINLESS STEEL BALLS TYPE AISI<br>420 | 12 | 22 | ±0,030 | 27,3 | 7,5  | ±0,2 | 16,8 | 4,5 | 20      | 8         | 0,035     |
| SPM 15 C  |   | 15 | 24 | ±0,065 | 31   | 9,5  | ±0,2 | 21   | 5,5 | 40      | 16        | 0,055     |
| SPM 22 C  |   | 22 | 36 | ±0,080 | 45   | 9,8  | ±0,2 | 30,5 | 6   | 120     | 48        | 0,185     |
| SPM 30 C  |   | 30 | 45 | ±0,080 | 55   | 13,8 | ±0,3 | 36,8 | 8   | 200     | 80        | 0,365     |
| SPM 45 C  |   | 45 | 62 | ±0,095 | 75   | 19   | ±0,4 | 53,5 | 10  | 300     | 120       | 0,990     |
| SPM 12 SS | COMPLETELY S.S. BODY TYPE AISI 303<br>AND S.S. BALLS TYPE AISI 420      | 12 | 22 | ±0,030 | 27,3 | 7,5  | ±0,2 | 16,8 | 4,5 | 20      | 8         | 0,035     |
| SPM 15 SS |   | 15 | 24 | ±0,065 | 31   | 9,5  | ±0,2 | 21   | 5,5 | 40      | 16        | 0,055     |
| SPM 22 SS |   | 22 | 36 | ±0,080 | 45   | 9,8  | ±0,2 | 30,5 | 6   | 120     | 48        | 0,185     |
| SPM 30 SS |   | 30 | 45 | ±0,080 | 55   | 13,8 | ±0,3 | 36,8 | 8   | 200     | 80        | 0,365     |
| SPM 45 SS |   | 45 | 62 | ±0,095 | 75   | 19   | ±0,4 | 53,5 | 10  | 300     | 120       | 0,990     |



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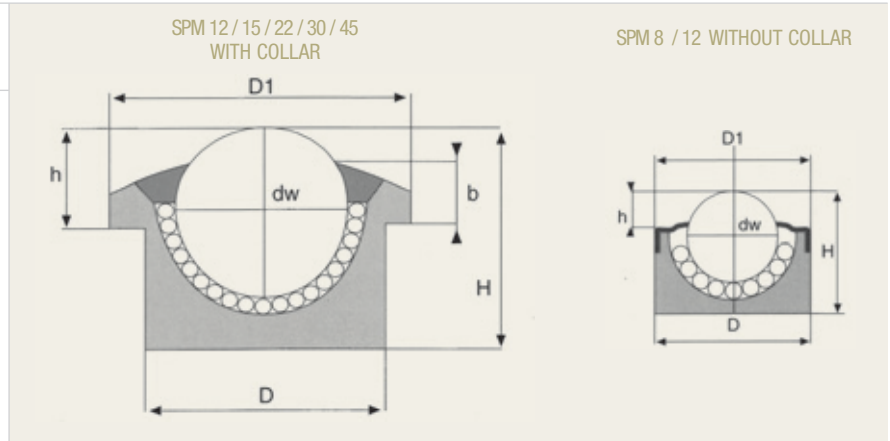


Load DOWN



## HEAVY-DUTY-TYPE "SPM" SERIE WITH PLASTIC BALL

WITH LARGE MAIN BALL IN POM – POLYACETAL/DELTRIN 500 P. WITHOUT SEALING SYSTEM/TEMPERATURE + 60 ° C – NOT SUITABLE FOR BALL DOWN APPLICATION. SELF CLEANING HOLE INCORPORATED IN ALL UNITS (EXCEPTED SBM 8)



| TYPE           | Specification  | Dw | D  | Tol    | D1   | h    | Tol  | H    | b   | Kg      |           |
|----------------|--|----|----|--------|------|------|------|------|-----|---------|-----------|
|                |  |    |    |        |      |      |      |      |     | Load UP | U. weight |
| SBM 8 B-D *    |  | 8  | 18 | ±0,030 | 18   | 2,2  | ±0,2 | 12   | -   | 3       | 0,015     |
| SBM 12 B-D *   |  | 12 | 22 | ±0,030 | 22   | 5,5  | ±0,2 | 17,5 | -   | 6       | 0,025     |
| SPM 12 B-D     | ZINC PLATED MACHINED BODY<br>LARGE BALL IN POLYACETAL(POM) AND<br>SMALL STEEL BALLS  | 12 | 22 | ±0,030 | 27,3 | 7,5  | ±0,2 | 16,8 | 4,5 | 6       | 0,028     |
| SPM 15 B-D     |  | 15 | 24 | ±0,065 | 31   | 9,5  | ±0,2 | 21   | 5,5 | 9       | 0,030     |
| SPM 22 B-D     |  | 22 | 36 | ±0,080 | 45   | 9,8  | ±0,2 | 30,5 | 6   | 15      | 0,100     |
| SPM 30 B-D     |  | 30 | 45 | ±0,080 | 55   | 13,8 | ±0,3 | 36,8 | 8   | 25      | 0,200     |
| SPM 45 B-D     |  | 45 | 55 | ±0,095 | 75   | 19   | ±0,4 | 53,5 | 10  | 40      | 0,450     |
| SBM 8 C-D *    |  | 8  | 18 | ±0,030 | 18   | 2,2  | ±0,2 | 12   | -   | 3       | 0,015     |
| SBM 12 C-D *   |  | 12 | 22 | ±0,030 | 22   | 5,5  | ±0,2 | 17,5 | -   | 6       | 0,025     |
| SPM 12 C-D     | ZINC PLATED MACHINED BODY<br>LARGE BALL IN POLYACETAL(POM) AND<br>SMALL STAINLESS STEEL BALLS TYPE AISI<br>420             | 12 | 22 | ±0,030 | 27,3 | 7,5  | ±0,2 | 16,8 | 4,5 | 6       | 0,028     |
| SPM 15 C-D     |  | 15 | 24 | ±0,065 | 31   | 9,5  | ±0,2 | 21   | 5,5 | 9       | 0,030     |
| SPM 22 C-D     |  | 22 | 36 | ±0,080 | 45   | 9,8  | ±0,2 | 30,5 | 6   | 15      | 0,100     |
| SPM 30 C-D     |  | 30 | 45 | ±0,080 | 55   | 13,8 | ±0,3 | 36,8 | 8   | 25      | 0,200     |
| SPM 45 C-D     |  | 45 | 55 | ±0,095 | 75   | 19   | ±0,4 | 53,5 | 10  | 40      | 0,450     |
| SBM 8 SSC-D *  |  | 8  | 18 | ±0,030 | 18   | 2,2  | ±0,2 | 12   | -   | 3       | 0,015     |
| SBM 12 SSC-D * |  | 12 | 22 | ±0,030 | 22   | 5,5  | ±0,2 | 17,5 | -   | 6       | 0,025     |
| SPM 12 SSC-D   | COMPLETELY SS. MACHINED BODY AISI<br>303 LARGE BALL IN POLYACETAL(POM)<br>AND SMALL STAINLESS STEEL BALLS TYPE<br>AISI 420 | 12 | 22 | ±0,030 | 27,3 | 7,5  | ±0,2 | 16,8 | 4,5 | 6       | 0,028     |
| SPM 15 SSC-D   |  | 15 | 24 | ±0,065 | 31   | 9,5  | ±0,2 | 21   | 5,5 | 9       | 0,030     |
| SPM 22 SSC-D   |  | 22 | 36 | ±0,080 | 45   | 9,8  | ±0,2 | 30,5 | 6   | 15      | 0,100     |
| SPM 30 SSC-D   |  | 30 | 45 | ±0,080 | 55   | 13,8 | ±0,3 | 36,8 | 8   | 25      | 0,200     |
| SPM 45 SSC-D   |  | 45 | 55 | ±0,095 | 75   | 19   | ±0,4 | 53,5 | 10  | 40      | 0,450     |

 Load UP

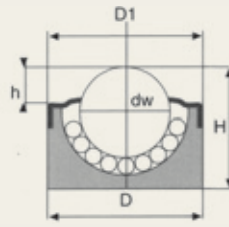
\* Without collar



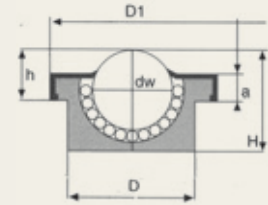
# HEAVY-DUTY-TYPE "SBM – SPM25" SERIES

BALL TRANSFER UNITS WITH BODY IN MACHINED & CASE HARDED LOW CARBON STEEL. SELF CLEANING HOLE INCORPORATED (EXCEPTED SBM 8). CLEANING HOLE INCORPORATED ONLY IN SBM 12 TYPE.

SBM 8 / SBM 12(2)  
WITHOUT COLLAR



SPM 25



| TYPE      | Specification  | Dw   | D  | Tol   | D1 | h   | Tol  | H    | a | Kg      |           | Kg    |
|-----------|--|------|----|-------|----|-----|------|------|---|---------|-----------|-------|
|           |  |      |    |       |    |     |      |      |   | Load UP | Load DOWN |       |
| SBM 8 B   | ZINC PLATED MACHINED BODY AND STEEL BALLS  | 8    | 18 | ±0,03 | 18 | 2,2 | ±0,1 | 12   | - | 15      | 6         | 0,018 |
| SBM 12 B  |  | 12   | 22 | ±0,03 | 22 | 5,5 | ±0,2 | 17,5 | - | 30      | 12        | 0,035 |
| SBM 8 C   | ZINC PLATED MACHINED BODY AND STAINLESS STEEL BALLS TYPE AISI 420                    | 8    | 18 | ±0,03 | 18 | 2,2 | ±0,1 | 12   | - | 10      | 4         | 0,018 |
| SBM 12 C  |  | 12   | 22 | ±0,03 | 22 | 5,5 | ±0,2 | 17,5 | - | 20      | 8         | 0,035 |
| SBM 8 SS  | COMPLETELY S.S. BODY TYPE AISI 303 AND S.S. BALLS TYPE AISI 420                      | 8    | 18 | ±0,03 | 18 | 2,2 | ±0,1 | 12   | - | 10      | 4         | 0,018 |
| SBM 12 SS |  | 12   | 22 | ±0,03 | 22 | 5,5 | ±0,2 | 17,5 | - | 20      | 8         | 0,035 |
| SPM 25 A  | BRIGHT METAL MACHINED BODY AND STEEL BALLS   | 25,4 | 38 | ±0,08 | 45 | 14  | ±0,2 | 31   | 5 | 200     | 80        | 0,190 |
| SPM 25 B  | ZINC PLATED MACHINED BODY AND STEEL BALLS  | 25,4 | 38 | ±0,08 | 45 | 14  | ±0,2 | 31   | 5 | 200     | 80        | 0,190 |
| SPM 25 C  | ZINC PLATED MACHINED BODY AND STAINLES STEEL BALLS TYPE AISI 420                     | 25,4 | 38 | ±0,08 | 45 | 14  | ±0,2 | 31   | 5 | 110     | 44        | 0,190 |
| SPM 25 D  | ZINC PLATED MACHINED BODY . POLYACETAL LARGE BALL AND S.S. SMALL BALLS TYPE AISI 420 | 25,4 | 38 | ±0,08 | 45 | 14  | ±0,2 | 31   | 5 | 18      | 7         | 0,110 |
| SPM 25 SS | COMPLETELY S.S. BODY TYPE AISI 303 AND S.S. BALLS TYPE AISI 420                      | 25,4 | 38 | ±0,08 | 45 | 14  | ±0,2 | 31   | 5 | 110     | 44        | 0,190 |



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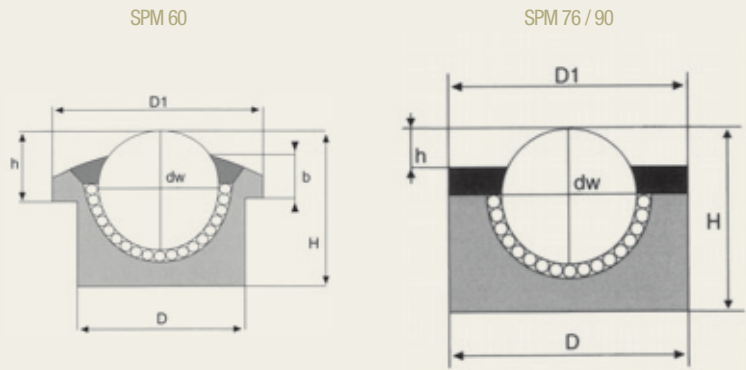


Load DOWN



## SUPER HEAVY-DUTY-TYPE "SPM" SERIE FOR VERY SHOCK LOADS & LONG LIFE APPLICATIONS

SOLID MACHINED BODY STEEL FOR VERY HEAVY LOADS AND LONG LIFE. MACHINED STEEL HOUSING TYPE. UNI 18NiCrMo5(=UNI 7846/AFBNOR 18NCD6/B.S. EN353). HARDENING: CARBONITRIDING TYPE CM7. HARDNESS HRC 60, THICKNESS 0,6/0,8 mm. SELF CLEANING HOLE AND SEALING SYSTEM INCORPORATED. A&B TYPES=LARGE BALLS: CHROME STEEL BALLS AISI 52100 G200 ISO 3290, SMALL BALLS: CHROME STEEL BALLS AISI 52100 G100 ISO 3290 . HARDNESS HRC: 60-62



| TYPE     | Specification   | Dw | D   | Tol    | D1  | h    | Tol   | H    | b    | Kg      |           |           |
|----------|---|----|-----|--------|-----|------|-------|------|------|---------|-----------|-----------|
|          |   |    |     |        |     |      |       |      |      | Load UP | Load DOWN | U. weight |
| SPM 60 A | BRIGHT METAL MACHINED BODY AND CHROME STEEL BALL                  | 60 | 100 | ±0,010 | 117 | 29,5 | ±0,4  | 77,5 | 14,5 | 1500    | 600       | 3,5       |
| SPM 60 B | ZINC PLATED MACHINED BODY AND CHROME STEEL BALLS                  | 60 | 100 | ±0,010 | 117 | 29,5 | ±0,4  | 77,5 | 14,5 | 1500    | 600       | 3,5       |
| SPM 60 C | ZINC PLATED MACHINED BODY AND STAINLESS STEEL BALLS TYPE AISI 420 | 60 | 100 | ±0,010 | 117 | 29,5 | ±0,4  | 77,5 | 14,5 | 900     | 360       | 3,5       |
| SPM 76 A | BRIGHT METAL MACHINED BODY AND CHROME STEEL BALL                  | 76 | 130 | ±0,080 | 130 | 23   | ±0,05 | 103  | -    | 2500    | 1000      | 8,6       |
| SPM 76 B | ZINC PLATED MACHINED BODY AND CHROME STEEL BALLS                  | 76 | 130 | ±0,080 | 130 | 23   | ±0,05 | 103  | -    | 2500    | 1000      | 8,6       |
| SPM 76 C | ZINC PLATED MACHINED BODY AND STAINLESS STEEL BALLS TYPE AISI 420 | 76 | 130 | ±0,080 | 130 | 23   | ±0,05 | 103  | -    | 1500    | 600       | 8,6       |
| SPM 90 A | BRIGHT METAL MACHINED BODY AND CHROME STEEL BALL                  | 90 | 145 | ±0,080 | 145 | 23   | ±0,05 | 115  | -    | 3000    | 1200      | 11        |
| SPM 90 B | ZINC PLATED MACHINED BODY AND CHROME STEEL BALLS                  | 90 | 145 | ±0,080 | 145 | 23   | ±0,05 | 115  | -    | 3000    | 1200      | 11        |
| SPM 90 C | ZINC PLATED MACHINED BODY AND STAINLESS STEEL BALLS TYPE AISI 420 | 90 | 145 | ±0,080 | 145 | 23   | ±0,05 | 115  | -    | 1800    | 720       | 11        |





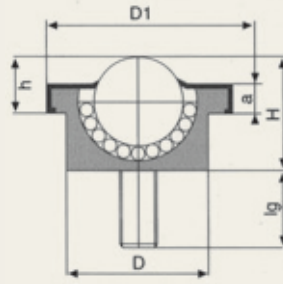
## HEAVY-DUTY-TYPE "SPM + FL" SERIE

SOLID MACHINED BODY STEEL WITH THREADED NUT FOR HEAVY LOADS (NO SEALING SYSTEM)

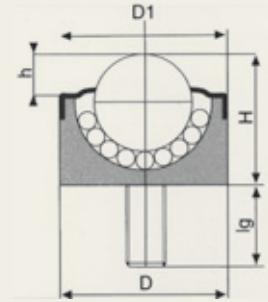
TD= THREAD DIAMETER 6mm-8mm-10mm OR DIFFERENT SIZE (ON REQUEST)

L= LENGTH 10mm-15mm-20mm-25mm-30mm OR DIFFERENT SIZE (ON REQUEST)

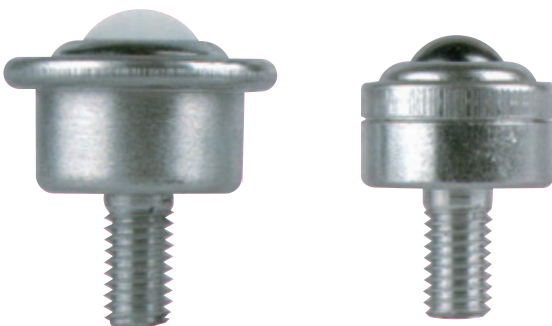
SPM 15



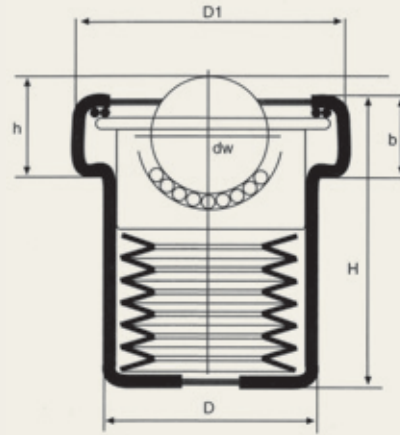
SBM 12




| TYPE            | Specification  | Dw | D  | Tol   | D1 | h  | Tol   | H  | a | Kg      |           |           |
|-----------------|--|----|----|-------|----|----|-------|----|---|---------|-----------|-----------|
|                 |  |    |    |       |    |    |       |    |   | Load UP | Load DOWN | U. weight |
| SBM 12 A-FL     | BRIGHT METAL MACHINED BODY AND STEEL BALLS   | 12 | 22 | ±0,06 | 22 | 6  | ±0,06 | 17 | - | 30      | 12        | 0,045     |
| SPM 15 A-FL     |  | 15 | 24 | ±0,06 | 31 | 10 | ±0,06 | 21 | 5 | 60      | 24        | 0,070     |
| SBM 12 B-FL     | ZINC PLATED MACHINED BODY AND STEEL BALLS  | 12 | 22 | ±0,06 | 22 | 6  | ±0,06 | 17 | - | 30      | 12        | 0,045     |
| SPM 15 B-FL     |  | 15 | 24 | ±0,06 | 31 | 10 | ±0,06 | 21 | 5 | 60      | 24        | 0,070     |
| SBM 12 C-FL     | ZINC PLATED MACHINED BODY AND STAINLESS STEEL BALLS TYPE AISI 420  | 12 | 22 | ±0,06 | 22 | 6  | ±0,06 | 17 | - | 12      | 6         | 0,045     |
| SPM 15 C-FL     |  | 15 | 24 | ±0,06 | 31 | 10 | ±0,06 | 21 | 5 | 25      | 10        | 0,070     |
| SBM 12 D-FL     | ZINC PLATED MACHINED BODY LARGE BALL IN POLYACETAL(POM) AND SMALL STAINLESS STEEL BALLS TYPE AISI 420            | 12 | 22 | ±0,06 | 22 | 6  | ±0,06 | 17 | - | 6       | -         | 0,035     |
| SPM 15 D-FL     |  | 15 | 24 | ±0,06 | 31 | 10 | ±0,06 | 21 | 5 | 8       | -         | 0,040     |
| SBM 12 SS-FL    | COMPLETELY S.S. BODY TYPE AISI 303 AND S.S. BALLS TYPE AISI 420  | 12 | 22 | ±0,06 | 22 | 6  | ±0,06 | 17 | - | 15      | 6         | 0,045     |
| SPM 15 SS-FL    |  | 15 | 24 | ±0,06 | 31 | 10 | ±0,06 | 21 | 5 | 25      | 10        | 0,070     |
| SBM 12 SS-CD-FL | COMPLETELY SS. MACHINED BODY AISI 303 LARGE BALL IN POLYACETAL(POM) AND SMALL STAINLESS STEEL BALLS TYPE AISI 42 | 12 | 22 | ±0,06 | 22 | 6  | ±0,06 | 17 | - | 6       | -         | 0,035     |
| SPM 15 SS-CD-FL |  | 15 | 24 | ±0,06 | 31 | 10 | ±0,06 | 21 | 5 | 8       | -         | 0,040     |



**HEAVY-DUTY SPRING LOADED TYPE "AF/CF"**



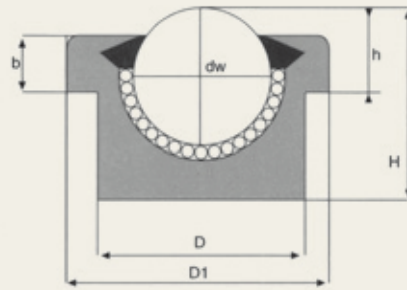
| TYPE      | Specification   | Dw | D    | D1 | h    | Tol    | H     | b    | Carga de compresión | Kg      | Kg        |
|-----------|---|----|------|----|------|--------|-------|------|---------------------|---------|-----------|
|           |   |    |      |    |      |        |       |      |                     | Load UP | U. weight |
| SPM 22 AF | BRIGHT METAL MACHINED BODY AND STEEL BALLS                      | 22 | 39   | 50 | 18,5 | ±0,100 | 58    | 14   | 7                   | 80      | 0,37      |
| SPM 30 AF |   | 30 | 48,5 | 62 | 24,5 | ±0,125 | 70    | 17,5 | 13                  | 150     | 0,62      |
| SPM 45 AF |   | 45 | 66,5 | 85 | 36   | ±0,150 | 100,5 | 25,5 | 22                  | 217     | 1,65      |
| SPM 22 CF | ZINC PLATED MACHINED BODY AND STAINLES STEEL BALLS TYPE AISI 42 | 22 | 39   | 50 | 18,5 | ±0,100 | 58    | 14   | 7                   | 80      | 0,37      |
| SPM 30 CF |   | 30 | 48,5 | 62 | 24,5 | ±0,125 | 70    | 17,5 | 13                  | 150     | 0,62      |
| SPM 45 CF |   | 45 | 66,5 | 85 | 36   | ±0,150 | 100,5 | 25,5 | 22                  | 217     | 1,65      |

 Load UP




## I PLASTIC TYPE- 1" BALL DIAMETER

BODY IN "ABS" PLASTIC MATERIAL – HARDENED BALL IN RACE STEEL



| TYPE      | Specification   | Dw   | D    | Tol  | D1   | h    | Tol  | H    | Tol  | b   | Kg      |           |           |
|-----------|---|------|------|------|------|------|------|------|------|-----|---------|-----------|-----------|
|           |   |      |      |      |      |      |      |      |      |     | Load UP | Load DOWN | U. weight |
| SP 25 P A | PLASTIC BODY & ALL BALLS IN STEEL                               | 25,4 | 37,5 | ±0,5 | 45,5 | 14,7 | ±0,3 | 32,5 | ±0,5 | 8,3 | 40      | 16        | 0,140     |
| SP 25 PC  | PLASTIC BODY & ALL BALLS IN S.S. AISI 420                       | 25,4 | 37,5 | ±0,5 | 45,5 | 14,7 | ±0,3 | 32,5 | ±0,5 | 8,3 | 30      | 12        | 0,140     |
| SP 25 PCD | PLASTIC BODY, LARGE PLASTIC BALL & SMALL BALLS IN S.S. AISI 420 | 25,4 | 37,5 | ±0,5 | 45,5 | 14,7 | ±0,3 | 32,5 | ±0,5 | 8,3 | 10      | -         | 0,080     |

 Load UP

 Load DOWN



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