
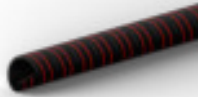



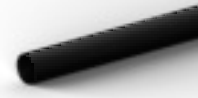


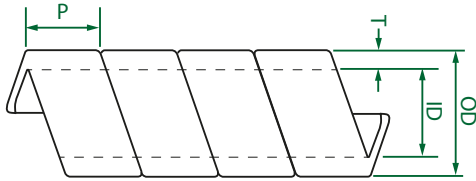


# HOSE PROTECTIONS



**The Manuli Hydraulics range of hose protections is the culmination of decades of experience in the hydraulic connectors industry. Our hose protections are designed to meet the most stringent of international safety standards, whilst also actively preventing hose damage and potential injury.**

| PROTECTION TYPE   | KEY FEATURES                           |            |                          |                                 |  |   |          |
|---|--|------------|--------------------------|---------------------------------|--|---|----------|
|   | Material                               | Size (mm)  | Colour                   | Temperature Range               | Specifications   | Key Properties  | Page No. |
|  <p>PROTECTION SPRING<br/><b>PS</b></p>                | POLYETHYLENE                           | 9 - 84     | BLACK OR YELLOW          | -40°C TO +90°C                  | MANULI <sup>®</sup> DESIGN   | HIGH FLEXIBILITY;<br>HIGH ABRASION RESISTANCE                                       | 608      |
|  <p>MINING PROTECTION SPRING</p>                       | POLYETHYLENE (ANTISTATIC)              | 12 - 84    | BLACK WITH TWO RED LINES | -40°C TO +90°C                  | MANULI <sup>®</sup> DESIGN;<br>FRAS; MSHA;<br>ISO 6805             | HIGH ABRASION RESISTANCE;<br>FLAME RETARDANT & ANTISTATIC PROPERTIES                |          |
|  <p>HT PROTECTION SPRING<br/><b>HTPS</b></p>         | POLYAMMIDE                             | 10 - 60    | BLACK                    | -40°C TO +120°C                 | MANULI <sup>®</sup> DESIGN;<br>MSHA                                | HIGH TEMPERATURE AND ABRASION RESISTANCE;<br>FLAME RETARDANT; VERY HIGH FLEXIBILITY | 610      |
|  <p>TEXTILE SLEEVE</p>                               | POLYESTER FIBRES                       | 18 - 110   | BLACK                    | -50°C TO +100°C (PEAKS +140°C)  | MANULI <sup>®</sup> DESIGN;<br>FRAS; MSHA;<br>MDG41                | FLUID ENERGY DIFFUSION; ANTI-ABRASIVE; FLAME RETARDANT & ANTISTATIC PROPERTIES      |          |
|  <p>FIRE SLEEVE<br/><b>FSL</b></p>                   | SILICONE SLEEVE WITH GLASS FIBRE BRAID | 13 - 76    | ORANGE                   | -60°C TO +260°C (PEAKS +1500°C) | MANULI <sup>®</sup> DESIGN;<br>NFF16-101 & P92-507 (CLASS FO & M2) | EXTREME HEAT RESISTANCE;<br>EXTREME FLEXIBILITY AT LOW TEMPERATURES                 | 612      |
|  <p>HEAT SHRINKABLE SLEEVE<br/><b>HSSL</b></p>       | POLYOLEFIN                             | 31 - 51    | BLACK                    | -55°C TO +125°C                 | UL224 VW-1   | SELF EXTINGUISHING FLAME RESISTANCE; LOW VOLTAGE ELECTRICAL INSULATION              |          |
|  <p>STAINLESS STEEL ARMOUR GUARD<br/><b>SSAG</b></p> | STAINLESS STEEL                        | 10 - 51    | SILVER                   | -                               | API 16D FIRE TEST  | HIGH ABRASION RESISTANCE;<br>EXTREME HEAT RESISTANCE                                | 614      |
|  <p>TEXTILE CLINCH STRAP</p>                         | POLYESTER FIBRES                       | 400 - 1500 | BLACK                    | -50°C TO +100°C                 | MANULI <sup>®</sup> DESIGN;<br>FRAS; MSHA                          | FLAME RETARDANT & ANTISTATIC PROPERTIES   |          |



| PART. REF      | DESCRIPTION                    | DIMENSIONS             |      |                       |      |                    |       |           |      |                |           |        |       |                      |    |
|----------------|--------------------------------|------------------------|------|-----------------------|------|--------------------|-------|-----------|------|----------------|-----------|--------|-------|----------------------|----|
|                |                                | INTERNAL DIAMETER (ID) |      | OUTSIDE DIAMETER (OD) |      | WALL THICKNESS (T) |       | PITCH (P) |      | WRAPPING RANGE |           | WEIGHT |       | STANDARD PACK LENGTH |    |
|                |                                | MM                     | IN   | MM                    | IN   | MM                 | IN    | MM        | IN   | MM             | IN        | G/M    | LB/FT | M                    | FT |
| JP11B01009E099 | BLACK PROTECTION SPRING DN 9   | 9.0                    | 0.35 | 13.0                  | 0.51 | 2.00               | 0.079 | 11.0      | 0.43 | 9-13           | 0.35-0.51 | 50     | 0.03  | 20                   | 66 |
| JP11B01012E099 | BLACK PROTECTION SPRING DN 12  | 12.0                   | 0.47 | 16.5                  | 0.65 | 2.25               | 0.089 | 13.0      | 0.51 | 12-17          | 0.47-0.66 | 60     | 0.04  | 20                   | 66 |
| JP11B01015E099 | BLACK PROTECTION SPRING DN 15  | 15.0                   | 0.59 | 20.0                  | 0.79 | 2.50               | 0.098 | 15.5      | 0.61 | 15-22          | 0.59-0.86 | 90     | 0.06  | 20                   | 66 |
| JP11B01019E099 | BLACK PROTECTION SPRING DN 19  | 19.0                   | 0.75 | 24.5                  | 0.96 | 2.75               | 0.108 | 19.0      | 0.75 | 19-28          | 0.74-1.1  | 150    | 0.10  | 20                   | 66 |
| JP11B01023E099 | BLACK PROTECTION SPRING DN 23  | 23.0                   | 0.91 | 30.0                  | 1.18 | 3.50               | 0.138 | 23.0      | 0.91 | 23-33          | 0.9-1.29  | 225    | 0.15  | 20                   | 66 |
| JP11B01031E099 | BLACK PROTECTION SPRING DN 31  | 30.5                   | 1.20 | 39.0                  | 1.54 | 4.25               | 0.167 | 29.0      | 1.14 | 30-44          | 1.18-1.73 | 350    | 0.24  | 20                   | 66 |
| JP11B01038E099 | BLACK PROTECTION SPRING DN 38  | 38.0                   | 1.50 | 46.5                  | 1.83 | 4.25               | 0.167 | 36.0      | 1.42 | 38-65          | 1.49-2.55 | 400    | 0.27  | 20                   | 66 |
| JP11B01047E099 | BLACK PROTECTION SPRING DN 47  | 47.0                   | 1.85 | 58.0                  | 2.28 | 5.50               | 0.217 | 39.5      | 1.56 | 47-70          | 1.85-2.75 | 600    | 0.40  | 20                   | 66 |
| JP11B01061E099 | BLACK PROTECTION SPRING DN 61  | 61.0                   | 2.40 | 73.0                  | 2.87 | 6.00               | 0.236 | 44.0      | 1.73 | 61-90          | 2.4-3.54  | 950    | 0.64  | 20                   | 66 |
| JP11B01071E099 | BLACK PROTECTION SPRING DN 71  | 70.5                   | 2.78 | 84.5                  | 3.33 | 7.00               | 0.276 | 51.0      | 2.01 | 70-150         | 2.75-5.9  | 1150   | 0.77  | 20                   | 66 |
| JP11B01084E099 | BLACK PROTECTION SPRING DN 84  | 84.0                   | 3.31 | 99.0                  | 3.90 | 7.50               | 0.295 | 56.0      | 2.20 | 84-200         | 3.3-7.87  | 1500   | 1.01  | 10                   | 33 |
| JP11Y01009E099 | YELLOW PROTECTION SPRING DN 9  | 9.0                    | 0.35 | 13.0                  | 0.51 | 2.00               | 0.079 | 11.0      | 0.43 | 9-13           | 0.35-0.51 | 50     | 0.03  | 20                   | 66 |
| JP11Y01012E099 | YELLOW PROTECTION SPRING DN 12 | 12.0                   | 0.47 | 16.5                  | 0.65 | 2.25               | 0.089 | 13.0      | 0.51 | 12-17          | 0.47-0.66 | 60     | 0.04  | 20                   | 66 |
| JP11Y01015E099 | YELLOW PROTECTION SPRING DN 15 | 15.0                   | 0.59 | 20.0                  | 0.79 | 2.50               | 0.098 | 15.5      | 0.61 | 15-22          | 0.59-0.86 | 90     | 0.06  | 20                   | 66 |
| JP11Y01019E099 | YELLOW PROTECTION SPRING DN 19 | 19.0                   | 0.75 | 24.5                  | 0.96 | 2.75               | 0.108 | 19.0      | 0.75 | 19-28          | 0.74-1.1  | 150    | 0.10  | 20                   | 66 |
| JP11Y01023E099 | YELLOW PROTECTION SPRING DN 23 | 23.0                   | 0.91 | 30.0                  | 1.18 | 3.50               | 0.138 | 23.0      | 0.91 | 23-33          | 0.9-1.29  | 225    | 0.15  | 20                   | 66 |
| JP11Y01031E099 | YELLOW PROTECTION SPRING DN 31 | 30.5                   | 1.20 | 39.0                  | 1.54 | 4.25               | 0.167 | 29.0      | 1.14 | 30-44          | 1.18-1.73 | 350    | 0.24  | 20                   | 66 |
| JP11Y01038E099 | YELLOW PROTECTION SPRING DN 38 | 38.0                   | 1.50 | 46.5                  | 1.83 | 4.25               | 0.167 | 36.0      | 1.42 | 38-65          | 1.49-2.55 | 400    | 0.27  | 20                   | 66 |
| JP11Y01047E099 | YELLOW PROTECTION SPRING DN 47 | 47.0                   | 1.85 | 58.0                  | 2.28 | 5.50               | 0.217 | 39.5      | 1.56 | 47-70          | 1.85-2.75 | 600    | 0.40  | 20                   | 66 |
| JP11Y01061E099 | YELLOW PROTECTION SPRING DN 61 | 61.0                   | 2.40 | 73.0                  | 2.87 | 6.00               | 0.236 | 44.0      | 1.73 | 61-90          | 2.4-3.54  | 950    | 0.64  | 20                   | 66 |
| JP11Y01071E099 | YELLOW PROTECTION SPRING DN 71 | 70.5                   | 2.78 | 84.5                  | 3.33 | 7.00               | 0.276 | 51.0      | 2.01 | 70-150         | 2.75-5.9  | 1150   | 0.77  | 20                   | 66 |
| JP11Y01084E099 | YELLOW PROTECTION SPRING DN 84 | 84.0                   | 3.31 | 99.0                  | 3.90 | 7.50               | 0.295 | 56.0      | 2.20 | 84-200         | 3.3-7.87  | 1500   | 1.01  | 10                   | 33 |

**KEY FEATURES**

- High abrasion resistance
- High flexibility
- Resistant to water, oils, fuels and hydraulic fluids
- Easy to install, no clamps needed
- High ozone and external agents resistance

**CONTINUOUS SERVICE TEMPERATURE RANGE**

-40 °C, -40 °F

90 °C, 194 °F

**MAX. OPERATING TEMPERATURE**

90 °C, 194 °F

**MATERIAL**

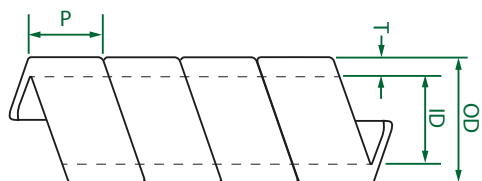
Polyethylene

**APPLICABLE SPECS**

Manuli® Design

MINING PROTECTION SPRING

**MPS**



| PART. REF      | DESCRIPTION                    | DIMENSIONS             |      |                       |      |                    |       |           |      |                |           |        |       |                      |    |
|----------------|--------------------------------|------------------------|------|-----------------------|------|--------------------|-------|-----------|------|----------------|-----------|--------|-------|----------------------|----|
|                |                                | INTERNAL DIAMETER (ID) |      | OUTSIDE DIAMETER (OD) |      | WALL THICKNESS (T) |       | PITCH (P) |      | WRAPPING RANGE |           | WEIGHT |       | STANDARD PACK LENGTH |    |
|                |                                | MM                     | IN   | MM                    | IN   | MM                 | IN    | MM        | IN   | MM             | IN        | G/M    | LB/FT | M                    | FT |
| JP11B02012E099 | MINING PROTECTION SPRING DN 12 | 12.0                   | 0.47 | 16.5                  | 0.65 | 2.25               | 0.089 | 13.00     | 0.51 | 12-17          | 0.47-0.66 | 60     | 0.04  | 20                   | 66 |
| JP11B02015E099 | MINING PROTECTION SPRING DN 15 | 15.0                   | 0.59 | 20.0                  | 0.79 | 2.50               | 0.098 | 15.50     | 0.61 | 15-22          | 0.59-0.86 | 90     | 0.06  | 20                   | 66 |
| JP11B02019E099 | MINING PROTECTION SPRING DN 19 | 19.0                   | 0.75 | 24.5                  | 0.96 | 2.75               | 0.108 | 19.00     | 0.75 | 19-28          | 0.74-1.10 | 150    | 0.10  | 20                   | 66 |
| JP11B02023E099 | MINING PROTECTION SPRING DN 23 | 23.0                   | 0.91 | 30.0                  | 1.18 | 3.50               | 0.138 | 23.00     | 0.91 | 23-33          | 0.91-1.29 | 225    | 0.15  | 20                   | 66 |
| JP11B02031E099 | MINING PROTECTION SPRING DN 31 | 30.5                   | 1.20 | 39.0                  | 1.54 | 4.25               | 0.167 | 29.00     | 1.14 | 30-44          | 1.18-1.73 | 350    | 0.24  | 20                   | 66 |
| JP11B02038E099 | MINING PROTECTION SPRING DN 38 | 38.0                   | 1.50 | 46.5                  | 1.83 | 4.25               | 0.167 | 36.00     | 1.42 | 38-65          | 1.49-2.55 | 400    | 0.27  | 20                   | 66 |
| JP11B02047E099 | MINING PROTECTION SPRING DN 47 | 47.0                   | 1.85 | 58.0                  | 2.28 | 5.50               | 0.217 | 39.50     | 1.56 | 47-70          | 1.85-2.75 | 600    | 0.40  | 20                   | 66 |
| JP11B02061E099 | MINING PROTECTION SPRING DN 61 | 61.0                   | 2.40 | 73.0                  | 2.87 | 6.00               | 0.236 | 44.00     | 1.73 | 61-90          | 2.40-3.54 | 950    | 0.64  | 20                   | 66 |
| JP11B02071E099 | MINING PROTECTION SPRING DN 71 | 70.5                   | 2.78 | 84.5                  | 3.33 | 7.00               | 0.276 | 51.00     | 2.01 | 70-150         | 2.75-5.9  | 1150   | 0.77  | 20                   | 66 |
| JP11B02084E099 | MINING PROTECTION SPRING DN 84 | 84.0                   | 3.31 | 99.0                  | 3.90 | 7.50               | 0.295 | 56.00     | 2.20 | 84-200         | 3.31-7.87 | 1500   | 1.01  | 10                   | 33 |

**KEY FEATURES**

- High abrasion resistance
- High flexibility
- Flame retardant and antistatic properties
- Resistant to water, oils, fuels and hydraulic fluids
- Easy to install, no clamps needed
- High visibility in field due to red central lines

**CONTINUOUS SERVICE TEMPERATURE RANGE**

-40 °C, -40 °F

90 °C, 194 °F

**MAX. OPERATING TEMPERATURE**

90 °C, 194 °F

**MATERIAL**

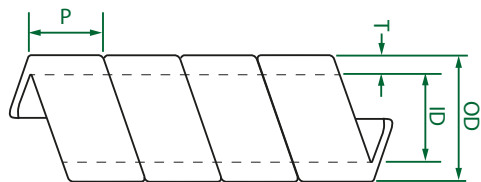
Polyethylene (antistatic)

**APPLICABLE SPECS**

Manuli® Design, MSHA, FRAS, ISO 6805

HIGH TEMPERATURE PROTECTION SPRING

**HTPS**



| PART. REF      | DESCRIPTION                | DIMENSIONS             |      |                       |      |                    |       |           |      |                |           |        |       |                      |      |
|----------------|----------------------------|------------------------|------|-----------------------|------|--------------------|-------|-----------|------|----------------|-----------|--------|-------|----------------------|------|
|                |                            | INTERNAL DIAMETER (ID) |      | OUTSIDE DIAMETER (OD) |      | WALL THICKNESS (T) |       | PITCH (P) |      | WRAPPING RANGE |           | WEIGHT |       | STANDARD PACK LENGTH |      |
|                |                            | MM                     | IN   | MM                    | IN   | MM                 | IN    | MM        | IN   | MM             | IN        | G/M    | LB/FT | M                    | FT   |
| JP12B03010I099 | HT PROTECTION SPRING DN 10 | 9.5                    | 0.37 | 11.5                  | 0.45 | 1.00               | 0.039 | 6.9       | 0.27 | 9-13           | 0.35-0.51 | 27     | 0.02  | 24                   | 79.2 |
| JP12B03011I099 | HT PROTECTION SPRING DN 11 | 11.0                   | 0.43 | 13.0                  | 0.51 | 1.00               | 0.039 | 6.9       | 0.27 | 11-13          | 0.43-0.52 | 35     | 0.025 | 24                   | 78.7 |
| JP12B03013I099 | HT PROTECTION SPRING DN 13 | 12.7                   | 0.50 | 16.3                  | 0.64 | 1.80               | 0.071 | 13.0      | 0.51 | 13-17          | 0.51-0.67 | 45     | 0.03  | 24                   | 79.2 |
| JP12B03014I099 | HT PROTECTION SPRING DN 14 | 14.0                   | 0.55 | 17.6                  | 0.69 | 1.80               | 0.071 | 13.0      | 0.51 | 14-17          | 0.55-0.67 | 50     | 0.035 | 24                   | 78.7 |
| JP12B03016I099 | HT PROTECTION SPRING DN 16 | 16.0                   | 0.63 | 19.6                  | 0.77 | 1.80               | 0.071 | 13.0      | 0.51 | 16-22          | 0.63-0.87 | 55     | 0.04  | 24                   | 79.2 |
| JP12B03019I099 | HT PROTECTION SPRING DN 19 | 19.0                   | 0.75 | 23.6                  | 0.93 | 2.30               | 0.091 | 16.0      | 0.63 | 19-28          | 0.75-1.10 | 100    | 0.07  | 24                   | 79.2 |
| JP12B03025I099 | HT PROTECTION SPRING DN 25 | 25.4                   | 1.00 | 30.0                  | 1.18 | 2.30               | 0.091 | 16.0      | 0.63 | 25-40          | 0.98-1.57 | 110    | 0.07  | 24                   | 79.2 |
| JP12B03028I099 | HT PROTECTION SPRING DN 28 | 28.0                   | 1.10 | 35.2                  | 1.39 | 3.60               | 0.142 | 25.0      | 0.98 | 28-48          | 1.10-1.89 | 225    | 0.15  | 24                   | 79.2 |
| JP12B03035I099 | HT PROTECTION SPRING DN 35 | 35.0                   | 1.38 | 42.2                  | 1.66 | 3.60               | 0.142 | 25.0      | 0.98 | 35-50          | 1.38-1.97 | 270    | 0.18  | 24                   | 79.2 |
| JP12B03050I099 | HT PROTECTION SPRING DN 50 | 50.0                   | 1.97 | 60.0                  | 2.36 | 5.00               | 0.197 | 35.0      | 1.38 | 50-70          | 1.97-2.76 | 540    | 0.36  | 12                   | 39.6 |
| JP12B03060I099 | HT PROTECTION SPRING DN 60 | 60.0                   | 2.36 | 70.0                  | 2.76 | 5.00               | 0.197 | 35.0      | 1.38 | 60-80          | 2.36-3.15 | 640    | 0.43  | 12                   | 39.6 |

**KEY FEATURES**

- High temperature resistance
- High abrasion resistance
- Very high flexibility
- Very low bend radius
- Flame retardant, MSHA approved
- Resistant to water, oils, fuels and hydraulic fluids
- Easy to install, no clamps needed

**CONTINUOUS SERVICE TEMPERATURE RANGE**

-40 °C, -40 °F

120 °C, 248 °F

**MAX. OPERATING TEMPERATURE**

120 °C, 248 °F

**MATERIAL**

Polyamide

**APPLICABLE SPECS**

Manuli<sup>®</sup> Design, MSHA

TEXTILE SLEEVE

**TSL**



| PART. REF      | DESCRIPTION           | DIMENSIONS             |      |                          |      |        |       |                      |     |
|----------------|-----------------------|------------------------|------|--------------------------|------|--------|-------|----------------------|-----|
|                |                       | INTERNAL DIAMETER (ID) |      | EXTERNAL FLATTENED WIDTH |      | WEIGHT |       | STANDARD PACK LENGTH |     |
|                |                       | MM                     | IN   | MM                       | IN   | G/M    | LB/FT | M                    | FT  |
| JP23B06018I099 | TEXTILE SLEEVE DN 18  | 18.0                   | 0.71 | 32.0                     | 1.26 | 2.0    | 4.4   | 50                   | 165 |
| JP23B06023I099 | TEXTILE SLEEVE DN 23  | 23.0                   | 0.91 | 40.0                     | 1.57 | 2.2    | 4.8   | 50                   | 165 |
| JP23B06029I099 | TEXTILE SLEEVE DN 29  | 29.0                   | 1.14 | 49.0                     | 1.93 | 2.5    | 5.5   | 50                   | 165 |
| JP23B06036I099 | TEXTILE SLEEVE DN 36  | 36.0                   | 1.42 | 56.0                     | 2.20 | 3.0    | 6.6   | 50                   | 165 |
| JP23B06040I099 | TEXTILE SLEEVE DN 40  | 40.0                   | 1.57 | 63.0                     | 2.48 | 3.2    | 7.0   | 50                   | 165 |
| JP23B06056I099 | TEXTILE SLEEVE DN 56  | 56.0                   | 2.20 | 88.0                     | 3.46 | 4.0    | 8.8   | 50                   | 165 |
| JP23B06063I099 | TEXTILE SLEEVE DN 63  | 63.0                   | 2.48 | 105.0                    | 4.13 | 5.0    | 11.0  | 50                   | 165 |
| JP23B06071I099 | TEXTILE SLEEVE DN 71  | 7.0                    | 0.28 | 115.0                    | 4.53 | 5.5    | 12.1  | 50                   | 165 |
| JP23B06093I099 | TEXTILE SLEEVE DN 93  | 93.0                   | 3.66 | 148.0                    | 5.75 | 7.2    | 15.8  | 50                   | 165 |
| JP23B06110I099 | TEXTILE SLEEVE DN 110 | 110.0                  | 4.33 | 176.0                    | 6.93 | 8.5    | 18.7  | 50                   | 165 |

## KEY FEATURES

- High abrasion resistance
- Resistant to water, oils, fuels and hydraulic fluids
- Fluid energy diffusion in case of hose failure to prevent direct jetting
- Easy to install with simple clamps to extremities
- Flame retardant and antistatic properties

## CONTINUOUS SERVICE TEMPERATURE RANGE

-50 °C, -58 °F

100 °C, 212 °F

## MAX. OPERATING TEMPERATURE

140 °C, 284 °F

## MATERIAL

Polyester fibres

## APPLICABLE SPECS

Manuli® Design, MSHA, FRAS, MDG41

FIRE SLEEVE

**FSL**



| PART. REF      | DESCRIPTION       | DIMENSIONS             |      |                            |      |        |       |                      |       |
|----------------|-------------------|------------------------|------|----------------------------|------|--------|-------|----------------------|-------|
|                |                   | INTERNAL DIAMETER (ID) |      | APPROX. WALL THICKNESS (T) |      | WEIGHT |       | STANDARD PACK LENGTH |       |
|                |                   | MM                     | IN   | MM                         | IN   | G/M    | LB/FT | M                    | FT    |
| JP24A05013I099 | FIRE SLEEVE DN 13 | 13.0                   | 0.51 | 4.0                        | 0.16 | 200.0  | 0.13  | 50                   | 165.0 |
| JP24A05016I099 | FIRE SLEEVE DN 16 | 16.0                   | 0.63 | 4.0                        | 0.16 | 220.0  | 0.15  | 50                   | 165.0 |
| JP24A05019I099 | FIRE SLEEVE DN 19 | 19.0                   | 0.75 | 4.0                        | 0.16 | 240.0  | 0.16  | 50                   | 165.0 |
| JP24A05022I099 | FIRE SLEEVE DN 22 | 22.0                   | 0.87 | 4.0                        | 0.16 | 260.0  | 0.17  | 50                   | 165.0 |
| JP24A05025I099 | FIRE SLEEVE DN 25 | 25.0                   | 0.98 | 4.0                        | 0.16 | 290.0  | 0.19  | 50                   | 165.0 |
| JP24A05032I099 | FIRE SLEEVE DN 32 | 32.0                   | 1.26 | 4.0                        | 0.16 | 380.0  | 0.26  | 50                   | 165.0 |
| JP24A05038I099 | FIRE SLEEVE DN 38 | 38.0                   | 1.50 | 4.0                        | 0.16 | 440.0  | 0.30  | 50                   | 165.0 |
| JP24A05045I099 | FIRE SLEEVE DN 45 | 45.0                   | 1.77 | 4.0                        | 0.16 | 490.0  | 0.33  | 25                   | 82.5  |
| JP24A05051I099 | FIRE SLEEVE DN 51 | 51.0                   | 2.01 | 4.0                        | 0.16 | 540.0  | 0.36  | 25                   | 82.5  |
| JP24A05064I099 | FIRE SLEEVE DN 64 | 64.0                   | 2.52 | 4.0                        | 0.16 | 680.0  | 0.46  | 20                   | 66.0  |
| JP24A05076I099 | FIRE SLEEVE DN 76 | 76.0                   | 2.99 | 4.0                        | 0.16 | 880.0  | 0.59  | 20                   | 66.0  |

## KEY FEATURES

- Extreme heat resistance
- Extreme flexibility at low temperatures
- Designed to protect and insulate hydraulic hoses and bundles of hoses against flames, metal projections, melting glass etc.
- Easy to install, no clamps needed

## CONTINUOUS SERVICE TEMPERATURE RANGE

-60 °C, -76 °F

260 °C, 500 °F

## MAX. OPERATING TEMPERATURE

1100 °C, 2012 °F for 15 minutes; 1500 °C, 2732 °F for 1 minute;

## MATERIAL

Silicone sleeve with glass-fibre braid

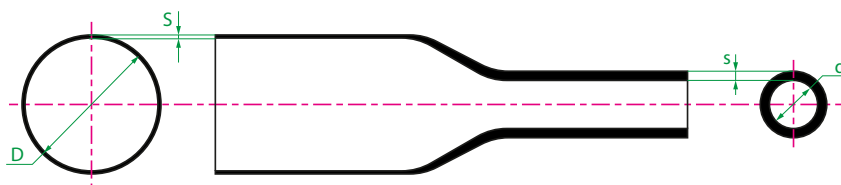
## APPLICABLE SPECS

Manuli<sup>®</sup> Design, NFF16-101 and P92-507 (class FO and M2)



HEAT SHRINKABLE SLEEVE

**HSSL**



| PART. REF      | DESCRIPTION                          | DIMENSIONS                            |      |  |      |                                    |       |                                     |       |        |       |                      |      |
|----------------|--------------------------------------|---------------------------------------|------|--|------|------------------------------------|-------|-------------------------------------|-------|--------|-------|----------------------|------|
|                |                                      | INTERNAL DIAMETER (D) - EXPANDED TUBE |      | INTERNAL DIAMETER (d) - RECOVERED TUBE |      | WALL THICKNESS (S) - EXPANDED TUBE |       | WALL THICKNESS (s) - RECOVERED TUBE |       | WEIGHT |       | STANDARD PACK LENGTH |      |
|                |                                      | MM                                    | IN   | MM                                     | IN   | MM                                 | IN    | MM                                  | IN    | G/M    | LB/FT | M                    | FT   |
| JP21B11076I099 | HEAT SHRINKABLE SLEEVE DN 31 / DN 38 | 76.2                                  | 3.00 | 38.1                                   | 1.50 | 0.6                                | 0.024 | 2.0                                 | 0.079 | 310    | 0.21  | 15                   | 49.2 |
| JP21B11102I099 | HEAT SHRINKABLE SLEEVE DN 51         | 101.6                                 | 4.00 | 50.8                                   | 2.00 | 1.0                                | 0.039 | 2.5                                 | 0.098 | 520    | 0.35  | 15                   | 49.2 |

## KEY FEATURES

- Self extinguishing
- Low voltage electrical insulation
- Easy to install with simple hot air jetting
- Protects ferrule from dirt and moisture ingress

## CONTINUOUS SERVICE TEMPERATURE RANGE

-55 °C, -67 °F

125 °C, 257 °F

## MAX. OPERATING TEMPERATURE

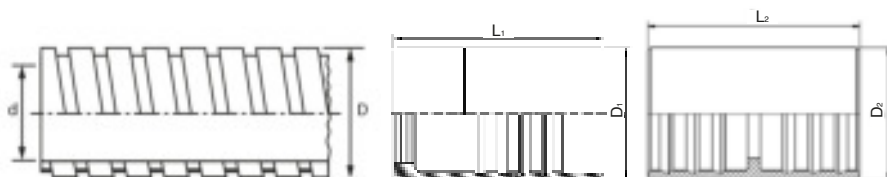
125 °C, 257 °F

## MATERIAL

X-linked polyolefin heat shrinkable thin wall

## APPLICABLE SPECS

UL 224 VW-1 for flame resistance



STAINLESS STEEL ARMOUR GUARD

**SSAG**

| PART. REF      | DESCRIPTION                        | DIMENSIONS            |        |                      |      |                  |       |        |       | METAL SLEEVE |       |     | ARMOUR JOINT |       |     |
|----------------|------------------------------------|-----------------------|--------|----------------------|------|------------------|-------|--------|-------|--------------|-------|-----|--------------|-------|-----|
|                |                                    | INTERNAL DIAMETER (d) |        | OUTSIDE DIAMETER (D) |      | MIN. BEND RADIUS |       | WEIGHT |       | PART. REF    | D1    | L1  | PART. REF    | D2    | L2  |
|                |                                    | MM                    | IN     | MM                   | IN   | MM               | IN    | G/M    | LB/FT |              | MM    | MM  |              | MM    | MM  |
| JP45G090280099 | STAINLESS STEEL ARMOUR GUARD DN10  | 25                    | 1"     | 32.0                 | 1.26 | 127              | 5.00  | 565    | 0.38  | IO2110-06GA  | 40.5  | 60  | IO84210-06   | 40.5  | 65  |
| JP45G090320099 | STAINLESS STEEL ARMOUR GUARD DN 12 | 31                    | 1.1/4" | 36.5                 | 1.44 | 150              | 5.91  | 703    | 0.47  | IO2110-08GA  | 46.8  | 75  | IO84210-08   | 46.8  | 65  |
| JP45G090400099 | STAINLESS STEEL ARMOUR GUARD DN 16 | 38                    | 1.1/2" | 44.5                 | 1.75 | 180              | 7.09  | 939    | 0.63  | IO2110-10GA  | 53.2  | 90  | IO84210-10   | 53.2  | 65  |
| JP45G090450099 | STAINLESS STEEL ARMOUR GUARD DN 19 | 46                    | 1.3/4" | 51.0                 | 2.01 | 240              | 9.45  | 1,118  | 0.75  | IO2110-12GA  | 59.5  | 105 | IO84210-12   | 59.5  | 70  |
| JP45G090500099 | STAINLESS STEEL ARMOUR GUARD DN 25 | 51                    | 2"     | 57.5                 | 2.26 | 300              | 11.81 | 1,301  | 0.87  | IO2110-16GA  | 66.0  | 120 | IO84210-16   | 66.0  | 75  |
| JP45G090650099 | STAINLESS STEEL ARMOUR GUARD DN 31 | 63                    | 2.1/2" | 70.0                 | 2.76 | 420              | 16.54 | 1,636  | 1.10  | IO2110-20GA  | 78.6  | 135 | IO84210-20   | 78.6  | 95  |
| JP45G090750099 | STAINLESS STEEL ARMOUR GUARD DN 38 | 76                    | 3"     | 82.5                 | 3.27 | 500              | 19.69 | 1,920  | 1.29  | IO2110-24GA  | 91.5  | 150 | IO84210-24   | 91.5  | 105 |
| JP45G090900099 | STAINLESS STEEL ARMOUR GUARD DN 51 | 89                    | 3.1/2" | 96.0                 | 3.78 | 630              | 24.80 | 2,386  | 1.60  | IO2110-32GA  | 106.5 | 165 | IO84210-32   | 106.5 | 115 |

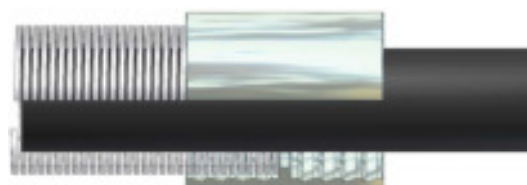
**ARMOUR JOINING PROCEDURE**

Individual pieces of the metal sleeve can be joined using a dedicated Armour Joint. The procedure for joining the pieces of flexible armour is as follows:

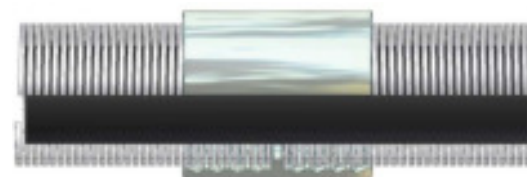
1. Slide the Armour Joint onto the hose.



2. Insert the first piece of flexible armour into the Armour Joint until it reaches the internal stop.

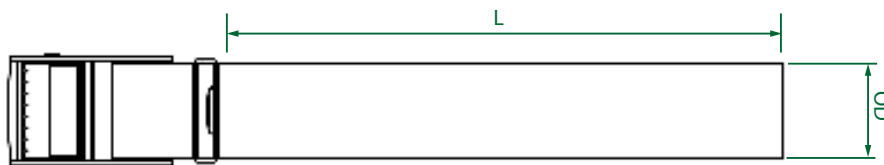


3. Insert the second piece of flexible armour into the other side of the Armour Joint until it also reaches the internal stop.



TEXTILE CLINCH STRAP

TCS



| PART. REF      | DESCRIPTION                | DIMENSIONS             |      |                       |      |                    |       |           |      |                |           |        |       |                      |      |
|----------------|----------------------------|------------------------|------|-----------------------|------|--------------------|-------|-----------|------|----------------|-----------|--------|-------|----------------------|------|
|                |                            | INTERNAL DIAMETER (ID) |      | OUTSIDE DIAMETER (OD) |      | WALL THICKNESS (T) |       | PITCH (P) |      | WRAPPING RANGE |           | WEIGHT |       | STANDARD PACK LENGTH |      |
|                |                            | MM                     | IN   | MM                    | IN   | MM                 | IN    | MM        | IN   | MM             | IN        | G/M    | LB/FT | M                    | FT   |
| JP12B03010I099 | HT PROTECTION SPRING DN 10 | 9.5                    | 0.37 | 11.5                  | 0.45 | 1.00               | 0.039 | 6.9       | 0.27 | 9-13           | 0.35-0.51 | 27     | 0.02  | 24                   | 79.2 |
| JP12B03013I099 | HT PROTECTION SPRING DN 13 | 12.7                   | 0.50 | 16.3                  | 0.64 | 1.80               | 0.071 | 13.0      | 0.51 | 13-17          | 0.51-0.67 | 45     | 0.03  | 24                   | 79.2 |
| JP12B03016I099 | HT PROTECTION SPRING DN 16 | 16.0                   | 0.63 | 19.6                  | 0.77 | 1.80               | 0.071 | 13.0      | 0.51 | 16-22          | 0.63-0.87 | 55     | 0.04  | 24                   | 79.2 |
| JP12B03019I099 | HT PROTECTION SPRING DN 19 | 19.0                   | 0.75 | 23.6                  | 0.93 | 2.30               | 0.091 | 16.0      | 0.63 | 19-28          | 0.75-1.10 | 100    | 0.07  | 24                   | 79.2 |
| JP12B03025I099 | HT PROTECTION SPRING DN 25 | 25.4                   | 1.00 | 30.0                  | 1.18 | 2.30               | 0.091 | 16.0      | 0.63 | 25-40          | 0.98-1.57 | 110    | 0.07  | 24                   | 79.2 |
| JP12B03028I099 | HT PROTECTION SPRING DN 28 | 28.0                   | 1.10 | 35.2                  | 1.39 | 3.60               | 0.142 | 25.0      | 0.98 | 28-48          | 1.10-1.89 | 225    | 0.15  | 24                   | 79.2 |
| JP12B03035I099 | HT PROTECTION SPRING DN 35 | 35.0                   | 1.38 | 42.2                  | 1.66 | 3.60               | 0.142 | 25.0      | 0.98 | 35-50          | 1.38-1.97 | 270    | 0.18  | 24                   | 79.2 |
| JP12B03050I099 | HT PROTECTION SPRING DN 50 | 50.0                   | 1.97 | 60.0                  | 2.36 | 5.00               | 0.197 | 35.0      | 1.38 | 50-70          | 1.97-2.76 | 540    | 0.36  | 12                   | 39.6 |
| JP12B03060I099 | HT PROTECTION SPRING DN 60 | 60.0                   | 2.36 | 70.0                  | 2.76 | 5.00               | 0.197 | 35.0      | 1.38 | 60-80          | 2.36-3.15 | 840    | 0.43  | 12                   | 39.6 |

KEY FEATURES

- High temperature resistance
- High abrasion resistance
- Very high flexibility
- Very low bend radius
- Flame retardant, MSHA approved
- Resistant to water, oils, fuels and hydraulic fluids
- Easy to install, no clamps needed

CONTINUOUS SERVICE TEMPERATURE RANGE

-40 °C, -40 °F

90 °C, 194 °F

MAX. OPERATING TEMPERATURE

90 °C, 194 °F

MATERIAL

Polyamide

APPLICABLE SPECS

Manuli® Design, MSHA

