



DENSOLEN®-Tape-Systems

Application Instruction

Installation must be done according to local regulations and usual safety precautions. Follow safety instructions given on DENSOLEN®-Primer.

Application temperature

Pipe surface	min. 3°C (5.4°F) above dew point up to +85°C (185°F)
Ambient	-40° up to +60°C (-40° up to 140°F)
DENSOLEN®-Primer HT	-10° up to +40°C (14° up to 104°F)
DENSOLEN®-Primer MT	-10° up to +50°C (14° up to 122°F)
DENSOLEN®-Tape	-10° up to +50°C (14° up to 122°F)

In order to avoid wrinkling due to thermal elongation of the PE carrier film, the temperature difference between pipe surface (before and after tape application) and tape roll should be max. 30°C (54°F).

Under prolonged exposure to sunlight, the finished wrapping should be covered with a suitable material (e.g. DENSOLEN®-DRM PP Rockshield).

Alternatively a white outerwrap with UV stabilizer such as DENSOLEN®-R20HT should preferably be used in case of two tape systems.

Steel surface condition

Cleanliness (ISO 8501-1)	min. ST2
Roughness (ISO 8503-1)	20 - 100 µm

1. Cleaning



- The areas to be coated (steel surface and adjacent factory coating) have to be clean, dry, and free from grease and dust.
- All contamination which might act as a release agent (e.g. grease, oil, varnishes, temporary protecting paints, coupling agents) have to be completely removed prior to tape application. Use suitable solvent if necessary.

2. Drying



- Humidity and ice have to be removed by drying with a torch flame.

3. Surface Preparation



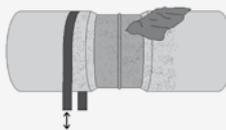
- Cleaning of steel surface can be done by wire brushing or abrasive blast cleaning.
- Any existing scale has to be removed by abrasive blast cleaning.

4. Transition to Factory Coating



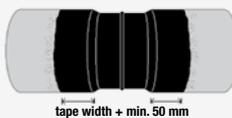
- Transitions to adjacent factory coating should be bevelled by use of a round shaped rasp (recommended angle: app. 30°). Remove grinding dust.

5. Preparation of Factory Coating



- Adjacent factory coating has to be cleaned in a width of app. 150 mm. Use suitable solvent, if necessary.
- Cleaned factory coating has to be circumferentially roughened with coarse emery cloth. Remove grinding dust.

6. Priming



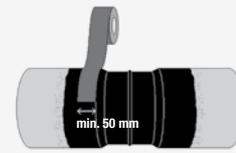
- Thoroughly stir DENSOLEN®-Primer in original drum until any bottom settlements are dissolved.
- By using a brush or roller apply a thin even coat of primer to the cleaned and dried surface.
- The factory coating has to be primed in a width of "tape width plus min. 50 mm" on each side.
- After use immediately close and seal primer drum. Clean brush or roller with suitable solvent (e.g. white spirit).

7. Priming - Drying



- Let the primer dry until it is tack free.
- The drying time depends on ambient temperature and air movement (approx. 10-30 min.).
- The primed surface should be wrapped latest within 6 h. Otherwise or in case of contamination (e.g. dust) the primer coat has to be renewed.

8. Innerwrap



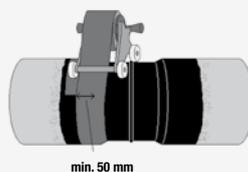
- In case of hand wrapping (tape width max. 50 mm) start with one circumferential wrap before spirally wrapping the tape. (start of wrapping: min. 50 mm on factory coating).
- Spirally wrap tape (e.g. DENSOLEN® 3-ply tapes with grey side facing the pipe surface) under tension with min. 50% overlap around the pipe.

9. Innerwrap



- Tape tension is sufficient, if tape width is narrowed by app. 1% during application.
- Remove interleaving.
- The tape wrapping should cover the full circumference of the adjacent factory coating by a width of min. 50 mm.

10. DENSOMAT® Wrapping



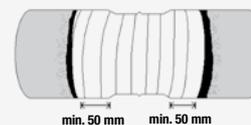
- When using DENSOMAT® wrapping devices, wrapping can start in spiral motion instead of one circumferential wrap (inner- and outerwrap).
- Start of wrapping on factory coating: min. 1.5 times of tape width.

11. Outerwrap



- In case of hand wrapping (tape width max. 50 mm) start with one circumferential wrap before spirally wrapping the tape.
- The outerwrap should at least fully cover the innerwrap. It is recommended to start wrapping by covering the innerwrap by 1/2 of tape width.
- Spirally wrap the outerwrap tape (e.g. DENSOLEN® 3-ply tapes with grey side facing the pipe surface) under tension with min 50% overlap around the pipe.

12. Outerwrap



- Tape overlap: Min. 50%.
- Tape tension is sufficient, if tape width is narrowed by app. 1% during application.
- Remove interleaving.
- The tape wrapping should cover the full circumference of the adjacent factory coating by a width of min. 50 mm.

Testing

- No wrinkles are allowed in the finished wrapping on visual testing.
- The wrapping has to be tested for freedom from pores with high voltage holiday detector. Test voltage: 5 kV + 5 kV per mm of coating thickness, max. 25 kV.

Recommendations

- It is highly recommended to use DENSOMAT® wrapping devices for application of tapes wider than or equal to 50 mm.
- In order to ensure that tapes are applied with sufficient wrapping tension, the tape width should be limited to max. 150 mm.

The above application instruction can also be transferred to the wrapping of full pipe length or pipe bends.