Soudafoam MAXTWO HFO

PRODUCT AND
APPLICATION GUIDE

SOUDAL

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ABOUT SOUDAL

SOUDAL
BUILD THE FUTURE

Soudal, based in Belgium, is Europe's leading independent manufacturer of sealants, construction foams and adhesives. The company, established in 1966 by Mr Vic Swerts, is 100% family owned. Soudal offers innovative products, providing solutions to most bonding, sealing, waterproofing and jointing applications. Our products are used in three principal market segments: construction, industry and DIY/hardware.

In 2011, Soudal was named "Enterprise of the Year" in Belgium. The Soudal group now has a worldwide staff of more than 2500 employees, of which more than a third work at the company head quarter in Turnhout (Belgium) where the main production lines, as well as the logistics, R&D and marketing departments are located. Soudal operates worldwide in its own branches in more than 54 countries in all continents and exports its products to more than 110 countries. In 2018 we had a turnover of EUR 835 million. For more information on Soudal please consult our website: www.soudal.com.

PROFESSIONAL QUALITY

- **Extensive R&D department**
- **Continuous investments inproduction lines and product development**
- **Production to ISO 9001 and ISO 14000 standards**

R&D center

R&D labo

Soudal academy

INTRODUCTION

Polyurethane foam chemistry is a great choice for insulation throughout any home or building. PU foam development continues to evolve, with market leaders regularly introducing new products that increase performance and safety benefits. Soudal has raised the bar again with a new low pressure 2-component polyurethane spray foam product line that contain a propellant that is environmentally safe, non-flammable, non-VOC, ultra-low GWP (Global Warming Potential of less than 1), and an ODP (Ozone Depletion Potential) of 0, which complies with the latest North American regulations banning all CFC-, HCFC-, and HFC-propellants.

PRODUCT DESCRIPTION

Insulation is a critical part of any building, and Soudal has developed a new low pressure 2-component polyurethane spray foam product line that helps keep the elements out, the environment unaffected, and the building occupants safe. Soudal's MAXTWO low pressure products are ideal for smaller jobs that aren't suitable for a high pressure system. They are very well suited for sealing and filling in professional and industrial applications. It is supplied as two portable, disposable, and pressurized cylinders. The products do not require external power sources, extra pressure or pumps. The tanks are connected to hoses mated to a dispensing gun with specially developed nozzles to ensure the correct mix ratio of the foam being sprayed. These products are for professional use only.

PRODUCT PROPERTIES

Soudafoam MAXTWO HFO are 2-component polyurethane foams that exhibit the following characteristics:

- High R-value that reduces heating and cooling costs
- No VOCs, non-flammable, <1 GWP, and ODP of 0
- Great for acoustic insulation
- Cures in minutes
- No shrinkage or expansion after curing
- Great adhesion to a variety of surfaces
- 200 boardfoot and 600 boardfoot sizes for different job sizes
- Disposable canisters that require no external power source

SAFETY ADVICE

Carefully read all the instructions included regarding safe handling, personal protection and best practices before using the kits. Persons sensitized to isocyanates are advised to not use these foam systems and stay away from the application area. See safety data sheet for more specific safety information about the products.

Both cylinders are under pressure. Do not puncture the cylinders, do not dispose before emptying. Avoid prolonged storage in direct sunlight or near heat sources. Do not breathe vapors or spray. Use only in a well-ventilated area. Isocyanate is present in one of the 2 components and can cause sensitization when exposed to skin or by inhalation. Use proper protective clothing. It is recommended to wear respiratory protection while operating the Soudafoam MAXTWO HFO system.

Do not overfill restricted area's because this product will expand and can cause a pressure build up resulting in an uncontrolled spill of foam.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment consists out of:

- Impermeable coverall
- Chemical-resistant gloves
- Safety glasses
- Safety shoes

This protective equipment is applicable to applicator, other persons which are present in the room and anybody else who is entering the spray area during application of foam. If PPE is contaminated, discard and replace immediately.

RESPIRATORY PROTECTION

Users must be respirator fit tested according to OSHA requirements. Proper respiratory protection includes NIOSH-approved full-face or half-face-mask with an organic vapor sorbent in combination with a P100 particulate filter. In some situations, where atmospheric levels may exceed the level for which an air-purifying respirator is effective, a positive-pressure mask with clean air supply is advised. Respirator cartridges should be changed periodically according to manufacturer's instructions.

VENTILATION

Use only in a well-ventilated area. Cross ventilation is recommended. During application a minimum of 10 air changes per hour (ACH) is recommended. This can be done by using a ventilation unit. Make sure that hose exhaust from ventilation unit is in a safe and secure location that will not be accessible to persons without proper PPE. Keep ventilating the working area for at least 1h after spraying is completed at no less than 10 ACH. Re-entry into working zone in less than 1h after application is only possible with proper PPE.

MARKING WORKING PERIMETER

Use warning signs to mark the working perimeter (minimum of 26 ft away in all directions from working zone and ventilation exhaust) and maintain this until at least 1h after spraying has ended.

SAFETY ADVICE

FIRST AID

Skin contact:

Avoid all contact with skin by wearing protective clothing (e.g. coverall). This may cause irritation or sensitization. If skin contact occurs, remove contaminated clothing, carefully remove uncured material and wash skin with soap and water. If irritation occurs or persists, seek medical attention. Cured foam can only be removed mechanically.

Eye contact:

Avoid all contact with eyes by wearing safety glasses. This causes irritation. If contact occurs, flush with clean water at low pressure for 15 minutes while keeping eyelids open. Seek medical attention.

Ingestion:

Do not induce vomiting. Seek medical attention.

Inhalation:

Do not breathe vapors or spray by using respiratory protection. In case of inhalation, move to area with fresh air. If breathing is difficult, seek medical attention.

CHEMICAL SPILLS

Isocyanate spill:

Dam the area of the spill with an oil absorbent (e.g. sawdust). Neutralize with solution of water (90%) and small amounts of dishwashing detergent (2%) and ammonia (8%). The amount of this solution should be in excess to the amount of the spill. Wear proper PPE and make sure area is well-ventilated. Put mixture in open bag in waste container and allow mixture to react for at least 15 minutes. Mix thoroughly and allow the waste container with bag to stabilize for 1 day, close the bag and dispose it according to local regulations.

Polyol spill:

Dam the area of the spill with an oil absorbent (e.g. sawdust). Mix the spill with soap and water. Wear proper PPE and make sure area is well-ventilated. Put mixture in a bag, close the bag and dispose it according to local regulations.

TECHNICAL DATA

APPLICATIONS

Soudafoam MAXTWO HFO systems are suitable for many construction and industrial applications. It can be used in many standard insulation and sealing jobs, as well as applications that require a high quality polyurethane foam:

- Basement insulation
- Residential wall insulation
- Sealing insulation between board joists
- Crawlspace insulation
- Insulating and sealing rim joists
- Sealing roof/wall junctions
- Sealing attic penetrations
- Repair of high pressure sprayed walls and non-load bearing floors
- Cold storage insulation
- Trailer insulation
- Boat insulation
- Pool and spa insulation
- Prefabricated houses
- Vehicle door insulation and vibration control
- And more!

SOUDAFOAM MAXTWO HFO

	DENSITY	THEORETICAL YIELD	GEL TIME	FIRE CLASSIFICATION ASTM E84/UL723 FSI/SDI	PACKAGING
	lb/ft³	bd ft	S	FSI/SDI	
Soudafoam MAXTWO HFO 	1.75	185	30	not applicable	1 box of approx. 42 lb. (*)
Soudafoam MAXTWO HFO XL 	1.75	615	30	not applicable	2 boxes of each approx. 55 lb (*)
Soudafoam MAXTWO HFO E84 	1.75	185	30	<25/<450; full coverage/2" thickness	1 box of approx. 42 lb. (*)
Soudafoam MAXTWO HFO E84 XL 	1.75	615	30	<25/<450; full coverage/2" thickness	2 boxes of each approx. 55 lb (*)
Soudafoam MAXTWO accessories Kit 	NA	NA	NA	NA	1 box of approx. 1.75 lb: -1 Soudal dispensing gun -2 hoses (**) -8 Cone nozzles (***) & 4 Fan Nozzles -1 wrench -1gun lubricant packet

*Soudafoam MAXTWO Accessories Kit & Gun/Hose Assembly is not included and is subsequently separately available. **Different hose lengths are available: 9, 15 and 30 ft

*** Cone and Fan nozzles are also separately available in bags of 25 pieces

TECHNICAL DATA

RECOMMENDED STORAGE AND SPRAY CONDITIONS		
STORAGE		
Temperature	59°F – 77°F	Higher storage temperature will speed up ageing
Conditions		Store in upright position and dry conditions. Do not store at temperatures above (122°F). Do not store near heat sources. Always close both cylinder valves during storage to avoid pressure loss. Always clean gun, apply gun lubricant and insert used nozzle before storage. Leave hoses pressurized to keep moisture out of the hoses.

Ambient Temperature	59°F - 95°F	
Substrate Temperature	59°F - 95°F	A too low or too high temperature can have a negative effect on foam (adhesion)
Component Temperature	59°F – 77°F	Too high or too low temperatures can have a negative influence on the mix ratio, foam quality and yield
Substrate Conditions	Dry and clean	Good adhesion on all surfaces (except for PE, PP and PTFE). Materials such as oil, grease, dust, loose debris, water and ice can affect adhesion. Substrates like aluminium and steel might require treatment with a primer or a coating. A damp surface can cause pin holes, blisters, a high percentage of open cells, poor mechanical strength, potential shrinkage and poor adhesion. Due to the exothermic reaction, substrates should be resistant to heat. When in doubt, the adhesion and/or heat resistance should be checked on the substrate or on a comparable sample.

Layer Thickness	2"	High foam thickness can be reached using several layers of max 50 mm (2"). It is advisable to wait 20 minutes between applying more layers onto each other, when a total thickness of > 4" is required.
UV-Protection	Coating	For outside applications, foam should be protected against UV-radiation.

HOW TO USE

It is advised to follow the below mentioned instructions to obtain the best results and safe handling of the Soudafoam MAXTWO HFO system. Make sure before operating the system that both cylinders have the correct temperature (ideally the cylinders were stored 24h at 68°F before starting the spray job):

PREPARING THE SYSTEM

- Before use, shake both cylinders for approximately 20 seconds (photo 1).
- Apply an amount of gun lubricant to the inside of the dispensing gun (photo 2).
- Attach the end of the red hose to the ISO cylinder and the end of the blue hose to the polyol cylinder. Tighten securely with the included wrench. The wrench is developed to deform if excessive pressure is applied (photo 3).
- Slowly open the valves of both cylinders until fully open and check for leaks and liquid flow inside hoses (photo 4).

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HOW TO USE

PURGING AND CHECKING THE SYSTEM

- Purge the system for 5 seconds into a waste container by first activating the red safety trigger and subsequently the main black trigger completely. Both product flows should be equal in volume to assure good foam quality (photo 5)
- When both flows are visually equal in volume, clean the gun with Soudal Gun & Foam Cleaner and re-apply some gun lubricant to the inside of the gun (photo 6)
- Insert the nozzle into the front of the gun. Make sure the nozzle fits perfectly in the dispensing gun until a "click" is audible
- Before spraying it is advised to do some test shots in a waste container to check if foam quality is good and if color of produced foam is homogeneous. (photo 7)
- Before starting with the spray process it is advised to do some test shots to get used to the spraying process if this is not the case

APPLY SOUDAFOAM MAXTWO HFO

- Check if the application conditions are conform the prescriptions mentioned in recommended storage and spray conditions.
- Hold the dispensing gun about 15-60 cm (6-24") away from the surface/space that has to be sprayed When a new foam kit is used it's advised to not completely activate the black trigger as this may result in a (too) high foam output. Towards the end of the kit this trigger can be activated more to obtain similar output as in the beginning of the spray process. (photo 8)
- Move the dispensing gun under controlled movement to cover the desired surface/space with foam
- Spray in foam layers of approx. 50 mm (2") thickness. While spraying the product an amount of heat is released because of the exothermic nature of the chemical PU reaction. Make sure that the substrate is not affected by this heat release. It is advised to do a test shot to verify this
- Replace nozzle when not been used for more than 20 seconds (earlier at higher component temperatures than 20°C (68°F)
- Check during spraying continuously if the foam is homogeneous of color and if a rigid, hard foam is formed after some minutes


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HOW TO USE

EMPTY CYLINDERS

When the cylinders are empty, 2 new tanks should be connected. Make sure both cylinders are completely empty for disposal (see disposal section).

- Close the valves of both cylinders.
- Empty remaining liquid in hoses into a waste container by activating the dispensing gun trigger.
- Follow instructions mentioned in the disposal part.
- Clean both hose ends with Soudal Gun & Foam Cleaner. Pay special attention to the cleaning of the ISO hose end. If not cleaned properly blockages or leaks may occur (photo 9).
- Connect the hoses to the new cylinders.
- Remove nozzle and clean dispensing gun with Soudal Gun & Foam Cleaner.
- Shake new cylinders thoroughly for 20 seconds.
- Open cylinder valves slowly and check for leaks.
- Purge system as mentioned before and visually check if both flows are equal in volume.
- Clean dispensing gun with Soudal Gun & Foam Cleaner.
- Apply sufficient gun lubricant in gun and insert new nozzle (photo 10, 11 and 12).
- Spray process can be continued.


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HOW TO USE

SHORT STORAGE (1-7 DAYS)

When cylinders are not empty and should be stored for a short period (1-7 days):

- Close both valves of the cylinders.
- Remove the nozzle and clean the gun with Soudal Gun & Foam Cleaner.
- Apply sufficient gun lubricant to the inside of the gun and reinsert the USED nozzle.
- System can be stored according to storage conditions up to 1 week.
- If spray process has to be continued, remove nozzle, shake both canisters for 20 seconds and open valves of both cylinders.
- Follow "purging and checking the system" instructions before starting new spray job.

LONG STORAGE (MORE THAN 1 WEEK)

When cylinders are not empty and should be stored for a period longer than a week:

- Close both valves of the cylinders.
- Remove the nozzle and clean the gun with Soudal Gun & Foam Cleaner. Apply sufficient gun lubricant to the inside of the gun and reinsert the USED nozzle.
- If the system has not been used for one week, it should be activated once a week.
- Shake both cylinders for 20 seconds.
- Open valves of both cylinders completely.
- Remove nozzle and purge for a few seconds in a waste container by pressing trigger completely. This will rinse the hoses.
- It is advised to repeat this once a week as long as the system is not used.
- Clean the gun with Soudal Gun & Foam Cleaner.
- Apply sufficient gun lubricant in the dispensing gun and reinsert the USED nozzle for storage.
- Close both valves of the cylinders.
- System can be stored according to storage conditions.
- If the spray process has to be continued, remove nozzle, shake both canisters for 20 seconds and open both cylinder valves.
- Follow "purging and checking the system" instructions before starting new spray job.

HOW TO USE

TROUBLESHOOTING

Soudafoam MAXTWO HFO systems are user and maintenance friendly if used properly. In some cases, when the system is not producing good foam due to different causes, the troubleshooting procedure should be consulted. Below is an overview of which situations can occur that indicates that the system is not operating correctly. Before taking actions, make sure both canisters have the recommended component temperature.

UNUSUAL SPRAY PATTERN

PROBLEM: Spray pattern is different compared to initial pattern.

SOLUTION: Check the nozzle. If the gun is not used for more than 20 seconds, the nozzle should be removed and gun should be cleaned. Next apply sufficient gun lubricant and insert a new nozzle. Before starting a new spray job, both cylinders should be shaken, the gun should always be cleaned and a new nozzle should be used. Make sure the system has the correct component temperature.

INHOMOGENEOUS FOAM COLOR

PROBLEM: Color of foam changes during spraying or is not homogeneous.

SOLUTION: Clean the gun, apply some gun lubricant and reinsert a new nozzle.
Make sure the system has the correct component temperature.

BAD FOAM QUALITY

PROBLEM: Foam is not curing properly and foam is too soft or too brittle.

SOLUTION: Clean the dispensing gun and replace the nozzle. If the problem is not solved, a blockage is present in one of the hoses. When the foam is brittle and slower in reaction, it is called "ISO" rich and a partial blockage of the "POLYOL" side exists. If the foam remains soft and is bright of color, it is called "POLYOL" rich and a partial blockage of the "ISO" side exists. In both cases the nozzle should be removed and the dispenser should be cleaned. Next the system should be purged as mentioned before in the "purging the system" step. If foam does not cure at all and remains liquid, then there is a total blockage of the ISO side. Remove the nozzle, clean the dispenser and follow again the procedure mentioned in the "purging the system" step, but purge 10 instead of 5 seconds. If the produced foam still has a bad quality, the gun hose assembly (GHA) should be changed by a new one. Make sure that the valves of both cylinders are closed and clean before attaching the new GHA. Make the system ready again for the spray job by purging the system. Repeat the spray process.

HOW TO USE

DISPOSAL OF CYLINDERS

Cylinders which are not empty should be treated as hazardous waste and can't be recycled. Empty cylinders can be disposed as scrap or normal industrial waste. Never puncture or incinerate the cylinders. Preparing the cylinders for disposal as scrap or normal industrial waste can be done by following the next procedure. Make sure the area is well ventilated and the correct PPE is used when following the disposal instructions.

- The remaining liquids in both cylinders should be transformed into a solid material that can be disposed as normal industrial waste.
- Open both valves and carefully dispense the remaining liquid in the cylinders with the dispensing gun and nozzle into a waste container until one or both product flows have stopped flowing.
- Remove the nozzle from the gun and continue with emptying the cylinders into a waste container which contains a plastic bag with some absorbent (e.g. sawdust) in it until one or both product flows are stopped with flowing again.
- When both cylinders are lifted they should feel empty and no liquid is audible.
- If this is not the case, a blockage is present in one or both hoses and the cylinder cannot be emptied and should be disposed as hazardous waste.
- Close both cylinders and depressurize the hoses completely by activating the triggers.
- Disconnect both hose ends from the cylinders while activating the triggers and place them into the waste container in case some residual pressure is still present inside the hoses.
- Hold the cylinders in upright position, in case of smaller amounts of remaining liquid, above the waste container with plastic bag and absorbent and open the valve slowly to release any residual pressure and liquid (photo 13).
- In case of an excess isocyanate remaining in the cylinder, a small amount of water should be poured over the liquid to convert it completely into a solid waste material.

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- Mix thoroughly and allow the waste container with bag to stabilize for 1 day, close the bag and dispose it as normal industrial waste.
- Cured foam pieces are inert and can be disposed of as normal waste.
- Empty cylinders can be disposed as scrap metal or normal industrial waste.
- Follow local regulations for more exact disposal instructions.
- In case of uncertainty, contact your local Soudal Products professional.

SOUDAFOAM MAXTWO HFO ACCESSORIES

NOZZLE TYPES

CONE

- Small spray pattern/bead application
- Sealing narrow spaces
- Foam injection

FAN

- Wide spray pattern/spray application
- Insulating larger surfaces

SOUDAL GUN & FOAM CLEANER

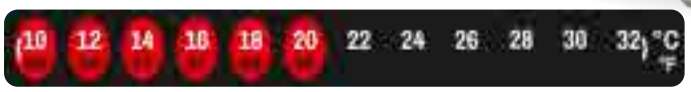
PROPERTIES

- Fast removal of non-cured PU Foam and PU Adhesives on nonporous surfaces, tools, materials and accessories
- For internal and external cleaning of gun, hose ends and valves

CYLINDER TEMPERATURE CONTROL INDICATOR

PROPERTIES

- Displaying actual component temperature in °C and °F. For optimal results temperature should be 20-25°C (68-77°F).
- Maximum product performance and highest yield
- Reduced risk on off-ratio foam and inferior foam quality
- Increased user safety



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