

## Product Type

One component Solvent Free, Impact Resistant Heat Curable Epoxy Based Adhesive

## Substrate Type

Cold Rolled Steel, Hot-Dip Galvanized Steel, Electro Galvanized Steel

## Application

TEROSON EP 4560 (known as TEROKAL 4560) is used in the body shop for bonding hem flange seams and spot weld bonding.

## Product Technology

TEROSON EP 4560 (known as TEROKAL 4560) is a heat curing, solvent free, metal to metal adhesive with good stability based on epoxy resins. The material can be spot welded and will reach maximum strength with curing temperatures between 160°C and 205°C. The product exhibits excellent strength and corrosion resistance at high temperature extremes or after extensive aging and weathering. TEROSON EP 4560 (known as TEROKAL 4560) provides exceptional impact resistance and outstanding peel resistance.

## Typical Properties

Property	Typical Results
Color	Blue
Odor	None
Consistency	Paste
Solids	>99%
Specific Gravity	1.15 ± 0.05
Curing Mechanism	Heat Cure
Press Viscosity 0.104" orifice, 25°C, 80 psi	45 – 60 sec
Shear Strength @ 23°C on EZG Bake 15 minutes @ 160°C Bake 10 minutes @ 171°C Bake 30 minutes @ 203°C	>14 MPa >14 MPa >14 MPa
Peel Resistance @ 23°C on EZG Bake 15 minutes @ 160°C Bake 10 minutes @ 171°C Bake 30 minutes @ 203°C	>6 N/mm >6 N/mm >6 N/mm
Fracture Toughness (ISO 11343)	17 – 25 N/mm
Application Temperature	23 °C – 40°C

## Operating Summary

- It is recommended that testing is completed on substrates to be used to validate this material prior to use.
- To obtain optimum strength the following cure conditions have proven successful:
  - >10 min @ 160°C metal temperature
  - <30 min @ 205°C metal temperature

- Deviations from cure cycle may result in deviations from the shear strength which may interfere with material performance.

## General Information

- Shutdown - For extended shutdown periods, greater than 8 hours, it is recommended that pressure be removed from the system to reduce possibility of caking in lines.
- Material Purge - Regular purge and cleaning of the application system is recommended, please contact your sales representative for material requirements and instructions.
- As with all materials, it is recommended that to ensure consistent material, this product is used in a First In - First Out stock rotation system.

## Equipment

- It is recommended that this material be dispensed using a pumping system. This should include a high pressure ratio pump, with recommended ratio of 55:1 or greater. Care should be taken in system design to insure that flow restrictions are minimized. Flow restrictions occur when headers, hoses, and/or nozzles are too small for the application. By reducing flow restriction, it is possible that lower ratio pumps can be used.
- Equipment with piston, gear or rotary pumps is suitable for the application of TEROSON EP 4560 (known as TEROKAL 4560) from pails or drums.
- The nozzle should be heated to 27°C - 40°C (80°F - 104°F) to increase flow and improve initial adhesion to oily substrates. If for certain reasons application temperature is above 40°C (104°F), it should be reduced because viscosity stability is diminished at higher temperatures.
- The application pistol can be used either manually, on a fixed basis, or attached to an automatic application system (robot, CNC). The applicator nozzle may be designed according to individual requirements.
- For small production, as well as preliminary tests, TEROSON EP 4560 (known as TEROKAL 4560) can also be supplied in 310 ml cartridges. These cartridges may be heated up to temperatures of 40°C (104°F) in a standard laboratory convection oven for about 35 – 40 minutes and finally be applied using standard cartridge guns. **(Warning! Risk of burning, wear protective gloves!)** If available, using special air-powered guns are even more convenient.
- If required we will provide you with the necessary information on suitable application equipment.
- The product is applied to untreated sheet steel which has not been pre-heated, and this can be carried out very neatly. TEROSON EP 4560 (known as TEROKAL 4560) achieves its final properties at temperatures above 160°C (EC oven, primer and paint oven).

## Metal Surface Preparation

- This material has been developed to adhere to a wide variety of material surfaces. While no pre-cleaning of the substrate is required, removal of excess lubricants is desired and clean substrate is preferred.
- For best performance, substrate should be free of contamination before material is applied.
- Cleaning of the substrate can be through mechanical and/or chemical methods.

## Product Removal

- Fresh, uncured material can be removed with the aid of solvent such as Mineral Spirits, Xylene or Toluene. Large amounts of material can be removed using towels or rags and then cleaned with solvent.
- Cured material can only be removed mechanically

## Health and Safety

- For safe handling information on this product, consult the **Material Safety Data Sheet (MSDS)**.
- Prior to application it is necessary to read the Safety Data Sheet for information about precautionary measures and safety recommendations.
- For chemicals exempt from compulsory labeling, the relevant precautions should always be observed.

## Product Control Test Method

- No specific test methods are recommended to be used by customer.
- Additional information on product testing is available upon request.

## Storage Requirements

- Store product in the unopened container in a dry location
- **Keep away from heat and direct sunlight.**
- **Store between 10°C and 30°C (50°F and 86°F). Optimal storage is below 25°C (77°F)**
- **Material is not frost sensitive.**
- **Shelf life of product is 90 days.**
- Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

## Waste Disposal

- Refer to MSDS for further information

## Order Information

- Bulk IDH Number **1463637**
- Please call for available packaging

**Creation Date** 19 August 2010

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**Revision Number** 2

## REVISION HISTORY

01.18.13 Updated storage temperatures and conditions.  
05.03.13 Updated name due to rebranding. Updated Typical Properties table.

## Conversions

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$   
 $\text{mm} / 25.4 = \text{inches}$   
 $\mu\text{m} / 25.4 = \text{mil}$   
 $\text{N} \times 0.225 = \text{lb}$   
 $\text{N/mm} \times 5.71 = \text{lb/in}$   
 $\text{N/mm}^2 \times 145 = \text{psi}$   
 $\text{MPa} \times 145 = \text{psi}$

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