

USE – TYPICAL VALUES - INFORMATIONS**USE**

ADHESIVITY AND COHESION DOPE
DOPE FOR RESTORING AND INCREASING MECHANICAL AND CHEMICAL PROPERTIES OF REPAVED ASPHALT AND RECYCLED ASPHALT
CONFECTION OF LOW TEMPERATURE RECYCLING ASPHALT $\geq 120^{\circ}\text{C}/248^{\circ}\text{F}$

TYPICAL VALUES

Properties	Methods	Units	Typical values
viscosity at 77:°F/ 25°C	EN 13072-2	m.Pa.s	80
specific gravity at 59°F/15°C	DIN 51757	g/cm ³	0,940
flashpoint	EN-ISO 2719	°F / C	356/180
			Flexibel values
saponification value	ASTM D803-15	mg KOH/g	130
acid value	ISO 1242	mg KOH/g	70
iodine value	BF-EN ISO 3961	g/100g	135
IRe		ppm	1550000
Fatty acids and their Esters		%	> 99,7

INFORMATIONS**DOSE :**

*-used for **increasing ADHESIVITY** properties of all kind of bitumen*

Greenseal AR added to bitumen
0,15 – 0,3 % in relation to the bitumen content in the asphalt

*-used for **RESTORING and INCREASING CHARACTERISTICS OF REPAVED- AND RECYCLING ASPHALT***

<i>repaved asphalt</i>	<i>fresh asphalt</i>
Q = < 50 %	Q = > 50 %
Mixing in drum mixer	

Greenseal AR added to the binder of the fresh asphalt
0,8 – 1,0 % in relation to the bitumen content in the repaved asphalt
confection of recycling asphalt at low temperature $\geq 248^{\circ}\text{F}/120^{\circ}\text{C}$

<i>repaved asphalt</i>	<i>fresh asphalt</i>
Q = > 60 %	Q = < 40 %
Greenseal AR in the parallel drum mixer	Greenseal AR in the drum mixer
0,8 – 1,0 % in relation of the binder content and characteristics	0,2 – 0,4 % in relation of the binder content
confection of low temperature recycling asphalt $\geq 248^{\circ}\text{F}/120^{\circ}\text{C}$	

SOLUBILITY : GREENSEAL AR is totally soluble in all bitumen, Following the great diversity of residual bituminous binders, we recommend a laboratory solubility check before using at industrial level.

REACTIVITY : GREENSEAL AR ,ternary mixture,, liquid at $40^{\circ}\text{F}/5^{\circ}\text{C}$, composed by middle and heavy distilled fatty acids and their esters, improves the chemical and mechanical properties of the paraffinic-and naphthenic bitumen. These properties are appointed by the concentration of **measurable** chemical radicals as mentionned in the table herunder :

IA : acid value	IS ::saponification index	II = Iodine value	*IRe/ ppm
70 mgKOH/g	130 mgKOH/g	135 gl2/100g	1550000
ASTM D465	ASTM D803-15	NF EN ISO 3961	$\Sigma \text{IA}+\text{IS}+\text{II}$

IA = carboxylic acids : « $R-\text{COOH}$ » ,
II = double carbonbindings : « $R>\text{C}=\text{C}<R-$ »
IS = esterified fatty acids : « $R-\text{COOR}$ » ,

These radicals added together forms a ***REACTIVITY POWER (Ire) = 1560000** ppm.of organic bases reacting with the molecules of the residual bitumen of the repaved asphalt but also with those of the fresh asphalt.which providing :for :

-the restoration and increasing of the original properties of the residual binder of the repaved asphalt and the enhacement of the recycling asphalt
-the increasing of the polarity of the repaved– and fresh asphalt
attribuating to GREENSEAL AR an higher adhesive and cohesive function of the binder to the mineral aggregates in the recycling and fresh asphalt

CONFECTION of LOW TEMPERATURE RECYCLING ASPHALT :

the non volatile fluxing power of GREENSEAL AR liquifies the residual- and fresh binder and reduces exponentially at low temperature their viscosities and allows the confection and the easy handling of recycling asphalt at low temperatures $\geq 248^{\circ}\text{F} / 120^{\circ}\text{C}$ with high quantities > 60 % repaved asphat..

The mechanical performances of recycling asphalt remains dependent of the quality and quantity of used repaved – and fresh asphalt added and a preliminary study of the various asphalt mixes is indicated.

MULTIRECYCLING : the high chemical reactivity power of GREENSEAL AR restores and enhances always the properties of the residual binder of the repaved asphalt and assumes the multirecycling function of used recycling asphalt .

TOXICOLOGY : GREENSEAL AR used in recycling asphalt is free from dangerous, toxic and harmful compounds and the confection at 120°C of low temperature recycling asphalt contributes to the health and protection of road staff, riverains and, the envionring fauna and flora.

ENVIRON : the confection of low temperature recycling asphalt at $\geq 248^{\circ}\text{F}$ / 120°C of repaved asphalt with GREENSEAL AR reduces combustion with less smoke, promoting the carbon footprint of the plant and asphalt.

CARBON FOOT PRINT

(based on the values from the producers of the substances used in GREENSEAL AR)

Greenseal	* + Cfp /CO ₂ e/kg	** - Cfp:CO ₂ e/kg..	** Net – Cfp result CO ₂ e/kg
Type E	+0,492	-1,463	--0,971

* +Cfp values for ::- transport raw materials to the yard, production process , confection storage and transport from our suppliers 'substances to :our shaping and tolling (IBC) company, and trader, note : no available Cfp values for shaping and tolling.

Biogenic carbon released

** -The photosynthesis with CO₂ captation from the atmosphere during the pinetree life, is fixed by EN-ISO 14967-2018 –EN 16785-1-2015 according LCA-14040-14044-Ecoinvent (version 38-of 21/09/2021-GHG protocol.)

Greenworld expects that the use of their substances with negativ Cfp values in the GREENSEAL AR contributes to the assimilation of a friendly ecological label.

CERTIFICATION : GREENSEAL AR is manufactured according to the ISO 9001 standard in an ISO 14001 certified workshop.

REGISTRATION : all substances used in the Greensal AR are « REACH » registrated by the producers, it follows of that registration for Greenseal AR becomes superfluous.

PACKAGE : in sealed and numbered IBC of 900 kg or in BULK min.20 t.

SHELF LIFE : Greenseal AR, packaged in sealed and numbered IBCs, has a shelf life of 8 years from its date of manufacture.

Its physicochemical properties remain unchanged, thus its original applications are not affected.

TRANSPORT : GREENSEAL AR , mixture with a flash point above > 213°F/100°C. is delivered in IBC at ambient temperature or in bulk lower then < 213°F/100°C.

STORAGE : store at room temperature > **41°F/ 5°C** and keep the packaging closed.

Prolonged storage at this temperature may form a partly solidification which liquefies upon heating without changing its initial properties.

EC CODIFICATION OF CUSTOMS DECLARATION

code **Y 106** by REACH restrictions defined in column 2 of Annex XVII of Regulation EC-07/2006.

CUSTOM TARIFF :
38291300

PRODUCER &-TRADING GREENSEAL AR

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