

STELLARFLEX FR – FUEL RESISTANT HOT MIX ASPHALT

PROCESS OVERVIEW AND GENERAL INFO

SCOPE

Exposure of asphalt pavements to fuel spills and oil leaks often results in excessive softening of the asphalt cement binder in the surface mix. This can further translate into premature surface defects such as rutting and ravelling. There are number of surfacing options available (e.g. coal tar sealers) to protect the surface, but such options often only last two to three years before exhibiting severe cracking and losing their intended purpose. Alternatively, **STELLARFLEX FR Fuel Resistant Hot Mix Asphalt** can be used to protect the pavement structure from the harmful effects of fuel and oil spills, as well as de-icing salts and chemicals. **STELLARFLEX FR** also provides a skid-resistant surface, while maintaining superior resistance to traffic and environmental associated loadings at different in-service temperatures.

DEFINITIONS

STELLARFLEX FR Fuel Resistant Hot Mix Asphalt (HMA) is a specialty asphalt mixture formulated to be resistant to the effects of fuel spills, oil leaks and de-icing chemicals. It is tailored to meet specific volumetrics and performance criteria for a wide range of applications, including:

- Airport pavements (runway, taxiway, de-icing stations)
- Heavily-loaded pavements with high volumes & slow truck traffic
- Fuelling/gas stations and fuel storage tank areas
- Truck and bus stops
- Seaports or commercial loading/off-loading areas

MATERIALS

STELLARFLEX FR - PGAC Fuel Resistant Asphalt Cements are engineered to resist the effect of light hydrocarbon fractions, such as fuels and lubricants, which soften and dissolve regular PGAC asphalts due to their chemical compatibility. In addition to fuel resistance, the asphalt cements also provide adequate levels of protection against distresses such as: (1) rutting at higher pavement temperatures, (2) fatigue cracking at intermediate temperatures, and (3) thermal cracking at lower pavement temperatures. **STELLARFLEX FR - PGAC** contains specialty modifiers and additives that enhance mix handling during production and provide better field workability at lower temperatures when compared to traditional HMA, while also achieving targeted mix density.

Aggregate Blend

The aggregate blend should consist of 100% crushed coarse and fine sources meeting a set of standardized physical properties to ensure long-term durability and strength of the asphalt mixture.

DESIGN CRITERIA

The design of **STELLARFLEX FR** includes the following steps:

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- Custom selection and formulation of **STELLARFLEX FR - PGAC** to meet the PG grade intended for adequate climate and traffic
- Aggregate selection and blending
- Designing a mix to meet volumetric requirements of either Superpave or Marshall methods
- Fuel resistance testing by performing a 24-hour soak test in kerosene.

RECOMMENDED PERFORMANCE GUIDELINES

STELLARFLEX FR can be designed to meet different specifications and performance criteria. The P-601 specification shown below and developed by the Federal Aviation Administration (FAA) is the most advanced specification for airports.

TEST	FEDERAL AVIATION ADMINISTRATION (FAA) P-601 SPECIFICATION	
	Minimum	Maximum
Gradation and PGAC		
9.5 mm	79	99
4.75 mm	58	78
2.36 mm	39	59
0.075 mm	3	6
AC Content (%)	5	8
Volumetric and Performance Requirements		
Marshall Stability (N)	9,567	...
Air Voids (%)	2.30	2.70
24-hour Mass Loss After Jet Fuel Immersion (%)	...	1.15

RECOMMENDED QUALITY CONTROL PLAN

The Quality Control Plan should provide guidance and advice on the proper production, lay-down and compaction, while offering continuous technical support during construction. The Quality Control Plan will ensure that at the least:

- **STELLARFLEX FR - HMA** is produced at the recommended temperature
- **STELLARFLEX FR - PGAC** is formulated to meet the specified requirements and is shipped at the correct temperature
- Appropriate lay-down equipment is utilized for projects
- Substrate is prepared adequately to receive mix
- Proper mix compaction to achieve target density



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